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Youth Assault-Injury Variation Patterns and Their Dimensional Structure

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Abstract

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by

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MHSA, Center for Strategic Health Studies, 2008

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Dissertation Submitted in Partial Fulfillment

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Abstract

Youth assault-injury is 1 of the 5 leading causes of adolescents' death in the United States. Despite public health efforts, the prevalence rates of youth assault-injury and almost all its risk factors have remained consistent in the past 10 years. The purpose in conducting this cross-sectional quantitative study using archival data of the Add Health Wave II in-home survey was to examine the underlying-multidimensional structure of youth assault-injury. Problem behavior theory (PBT) lens and a multidimensional model were used and a structural equation model was conducted to examine the relationships between 22 risk and protection variables, 3 unobserved latent factors, and assault-injury, while controlling for demographics. Three questions were answered that addressed whether the multidimensional model: (a) explained the underlying structure of youth assault-injury among the indicator variables and latent factors; (b) explained the relationships between assault-injury and indicator variables and latent factors; and (c) revealed whether the interaction among latent factors influenced assault-injury likelihood. The study results were affirmative for the 3 questions and explained the relationships between youth assault-injury and various risk and protection behaviors that researchers failed to examine in the past decade. The results also illustrated disagreements with many of the PBT's assumptions. Further research is necessary to affirm or dispute the study's results. The findings highlighted key intervention areas for adolescents' assault-injury prevention and control. Should public health practitioners use these study results, positive social change will occur from saving youths lives and altering their efforts toward positive contribution in their surroundings.

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Dedication

I dedicate this study to every adolescent who have survived assault-injury, to adolescents who have not, and to those who are living the adverse consequences of such a tragedy.

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Chapter 1: Introduction to the Study

In the United States, between 2009 and 2011, the nonfatal assault-injury rate increased from 769.6 to 868.4 per 100,000 female 10- to 24-year-olds. Among male10- to 24-year-olds, for the same period, the nonfatal assault-injury rate increased from 1245.0 to 1313.8 per 100,000 (Centers for Disease Control and Prevention [CDC], 2013d). On a daily basis, in 2011, emergency departments in the United States treated an average of 1,938 physical assault-injuries of 10- to 24-year-olds. Such cases totaled 707,212 (CDC, 2012a). In 2010, in the United States, on a daily average, 13 adolescents were victims of homicide (CDC, 2012a). Despite public health efforts, prevalence of behaviors contributing to youth violence and nonfatal assault-injury has been constant from 2009 to 2011 (CDC, 2013b; Eaton et al., 2012). Given the seriousness of youth assault-injury, it is noteworthy that researchers have not examined youth assault-injury etiology and dimensionality in the United States in the past 10 years by using an inclusive list of risk and protective factors.

The problem behavior theory (PBT; Jessor, 1987) buttressed many studies in which authors focused on adolescent injuries (Cunningham et al., 2011; Walsh et al., 2013). In this theory, Jessor (1987) suggested the influence of the interactions between the accumulation of risk and protective factors on the likelihood of problem behavior among adolescents. Jessor supposed that problem behaviors interrelate and co-occur in a problem behavior syndrome (PBS). There is evidence of this theory's applicability to adolescent problem behavior across cultures in the literature (Mobley & Chun, 2013; Vazsonyi et al., 2008; 2010; Willoughby, Chalmers, & Busseri, 2004). The co-occurrence of interrelated problem behaviors, namely the PBS, is also well established in the literature (Childs, 2014; Chun & Mobley, 2010).

In youth assault-injury literature, researchers using the PBT lens focused on a limited number of risk behaviors and frequently overlooked protective behaviors (Cunningham et al., 2011; Linakis et al., 2009; Murphy et al., 2010). Researchers have also reported contradictory results about the correlations between many of the PBT's risk and protective factors (e.g., cigarette smoking, delinquency, school performance) and youth assault-injury (Cunningham et al., 2011; Morash & Stevens, 2010; Ranney et al., 2011; Resnick, Ireland, & Borowsky, 2004). Furthermore, research is lacking on the relationships between many of the PBT constructs (e.g., risky sexual activity, risky driving, illicit drug use, driving while intoxicated, and church attendance) and youth assault-injury).

Associations between aggression and a list of problem behaviors exist in research, in which researchers embedded youth assault-injury in the aggression variables and examined the co-occurrence and interrelations of problem behaviors (Childs, 2014; Chun & Mobley, 2010). Researchers who examined the one-dimension co-occurrence of problem behaviors reported that the PBS explained a limited proportion of the variation of problem behaviors; researchers' results illustrated that multidimensional structures explained a greater proportion of the variation of problem behaviors co-occurrence (Dukes, Stein, & Zane, 2010; Guilamo-Ramos, Litardo, & Jaccard, 2005; Martinez-pons, 2011; Willoughby et al., 2004). Research in which authors examined the multidimensionality of youth assault-injury is absent in the literature I reviewed.

Based on the PBT, Røysamb, Rse, and Kraft (1997) empirically produced a multidimensional model for explaining the health-threatening and health-enhancing behaviors by a second-order level of categories/factors. These categories/factors are High Action, Addiction, and Protection. First-order relevant variables compose each of these categories. Risk sports and action, physical training, car speeding, and motorcycle risk comprise the High Action category while smoking, alcohol consumption, car driving while intoxicated, and risk behavior while intoxicated comprise the Addiction category in this model; physical training, proper diet, dental hygiene, using safety equipment, and wearing seat belts constitute the Protection category. Røysamb et al. used a list of injury-correlated variables and a list of health-related variables. Røysamb et al. developed this model to explain adolescents' health-related behaviors using a sample of Norwegian adolescents. However, the applicability of the construct of this model to American youth assault-injury is unknown.

In the present study, my examination of relationships among an inclusive list of theory-based risk and protective factors and American youth assault-injury by using the construct of Røysamb et al.'s (1997) multidimensional model revealed correlations and patterns of interactions in the underlying structure of youth assault-injury. The present study added to the scientific knowledge about youth assault-injury determinants and interactions. These results highlighted key intervention areas for public health practitioners. If practitioners benefit from these findings, my study will indirectly contribute to positive social change by decreasing the youth morbidity, mortality, and disability rates.

In this chapter, I discuss the background of youth assault-injury to highlight the need for conducting my study. Next, I introduce the problem statement and the purpose of the present study. Then, I present the questions that I answered and the hypotheses that I tested in my study. In subsequent pages, I explain my use of the theoretical foundation and briefly discuss the PBT behavior system constructs and the multidimensional model. Next, I introduce the nature of the study and discuss its appropriateness to address the research problem. Then, I list the terms and operational definitions of variables as they pertained to my study; I note the study's assumptions and discuss my research scope and delimitations, and I highlight the limitations of the study and potential contribution of its results to positive social change. I end this chapter with a summary and transition to chapter 2.

Background of the Study

In 1949, when John E. Gordon suggested that injuries have disease-like epidemiological characteristics, the discipline of scientific approach to injury etiology and prevention began (Sleet et al., 2012). Later, for the first time during a workshop on violence and public health in 1983, the surgeon general announced the recognition of injury as a public health concern (Sleet et al., 2012). In the year 1992, the National Center for Injury Prevention and Control funded community-based violence prevention programs (Sleet et al., 2012). The primary evaluation research for these programs illustrated the ability of skill-based public health programs to reduce youth violence (Sleet et al., 2012). In the same years, the CDC published unprecedented guidelines for youth violence prevention through community action (Sleet et al., 2012). In the year

2000, the CDC established 10 National Academic Centers of Excellence for Youth Violence Prevention (CDC, 2014d; Sleet et al., 2012). Nevertheless, youth violence remains a persistent problem that affects adolescents and their psychological development, as well as the entire society. The adverse consequences of youth violence expand beyond morbidity, disability, and mortality. Together, youth homicide and assault-related injuries burden the American economy with an estimated $16 billion annual medical and work loss cost (CDC, 2012b).

In addition to the immediate morbidity, disability, and mortality, adolescent violence (excluding sexual assault, self-harm, and suicide) has substantial emotional, psychological, and social consequences (CDC, 2013d). These consequences vary according to violence type, source, and frequency. Youth exposure to violence, either by witnessing or involvement, predicts externalizing problems as well as truancy and emotional problems (Boynton-Jarrett, Hair, & Zuckerman, 2013; Janosz et al., 2008; Haynie, Petts, Maimon, & Piquero, 2009; Walsh et al., 2013). Moreover, frequent victimization predicts trauma symptoms and psychological impairment (Finkelhor, Ormrod, & Turner, 2007; Logan-Greene, Nurius, Herting, Walsh, & Thompson, 2010). This poly-victimization has a substantial impact on psychological health and health-related quality of life (Cyr, Clément, & Chamberland, 2014; Schlack, Ravens-Sieberer, & Petermann, 2013). Peer victimization predicts increased depressive symptoms, social anxiety, stress, and locus of control (Boynton-Jarrett et al., 2013; Butters, Harrison, Korf, Brochu, & Erickson, 2011; Fredstrom, Adams, & Gilman, 2011; La Greca & Harrison, 2005; Nishina, Juvonen, & Witkow, 2005; Siegel, La Greca, & Harrison, 2009). In recent research, Fredstrom et al. (2011) and Wigderson and Lynch (2013) found positive associations between cyber-victimization (through the Internet) and low school grades and emotional problems. Steiner, Michael, Hall, Barrios, and Robin (2014) reported correlations between adolescent victimization and perpetration, and increased risk of future occurrence of sexually transmitted infections (STI).

Furthermore, youth exposure to violence predicts increased risk for running away from home, attempting suicide, and future contact with the criminal justice system (Haynie et al., 2009; Lin, Cochran, & Mieczkowski, 2011; Van Dulmen et al., 2013). Youth weapon victimization predicts future weapon carrying and weapon use (Butters et al., 2005). The exposure to different types of violence in various life domains (e.g., school, home, and community) predicts future alcohol and marijuana use (Wright, Fagan, & Pinchevsky, 2013). Walsh et al. (2013) reported associations between frequent engagements in physical fighting and somatic outcomes, including sleep difficulties, headache, stomachache, and bad temper. Margolin, Vickerman, Oliver, and Gordis (2010) also reported associations between cumulative exposure to violence over time and somatic outcomes, delinquency, and academic failure. Youth assault-injury predicts future assault-injury, posttraumatic disorder, and death (Cunningham et al., 2014). Currently, youth violence and assault-injury are significant public health problems in the United States (CDC, 2014a). However, analysis of the social consequences of youth violence is beyond the scope of this paper.

Youth assault-injury prevalence among 10- to 24-year-olds was higher among males: 1313.8 per 100,000 than females: 868.4 per 100,000 in 2011 (CDC, 2013e). Each year, in the United States, there is an average of 5,000 homicide deaths among 14- to 24-year olds (CDC, 2014c). In 2010, 86% of homicides were male, and 14% were female. The homicide prevalence rates illustrate 6 times higher rates among males than among females (Park, Scott, Adams, Brindis, & Irwin, 2014). In the United States, homicide is the second cause of death for 14- to 24-year-olds and the first cause of death for African Americans in the same age category (CDC, 2014b).

For the past decade, a consistent proportion of less than 2% of youth homicides occurred on school property (CDC, 2013b). At school, in 2010, there were 828,000 nonfatal victimizations among 12- to 18-year-old students (CDC, 2013b). Worth mentioning is that available statistical data exclude unreported youth assault-injury and those not requiring medical attention (Fein, Mollen, & Greene, 2013). These missing data render the depiction of a comprehensive picture for youth assault-injury prevalence incomplete.

Also notable is that between 1999 and 2009, except for the reduction in physical fighting, the public health system did not achieve any of the 2010 Healthy People objectives for adolescent violence (Olsen, Hertz, Shults, Hamburger, & Lowry, 2011). Regardless of public health efforts, the prevalence rates of youth nonfatal assault-injury and almost all behaviors that contribute to youth violence did not change significantly from 2009 to 2011 and from 2011 to 2013 (CDC, 2013c; Eaton et al., 2012; Kann et al., 2014; Park et al., 2014).

In the literature I reviewed, except for the prevention research, authors focused less frequently on youth assault-injury compared to the wealth of youth violence studies.

In such studies, researchers embedded youth assault-injury in the youth violence measures with other violence-related items, such as carrying a weapon, weapon threat to others, and engagement in physical fights (Buckley, Chapman, & Sheehan, 2012; Henry, Tolan, Gorman-Smith, & Schoeny, 2012; Herrenkohl, Lee, & Hawkins, 2007; Reingle, Jennings, Lynne-Landsman, Cottler, & Maldonado-Molina, 2013; Stoddard, Zimmerman, & Bauermeister, 2013). Such studies, even when researchers reported statistically significant results, are not sufficient to establish evidence of relationships among youth assault-injury and risk and protective variables. In Chapter 2, I discuss in detail the various concepts related to youth assault-injury in youth violence research.

Often, in research on adolescents' injury, authors combine intentional and unintentional injury in the same variable, while inaccurately assuming similarity in the risk and protective factors of both types (de Looze et al., 2011; Linakis et al., 2009; Walsh et al, 2013). In some cases, when researchers distinguished intentional from unintentional injury, they combined suicide with homicide in the same category (Mattila et al., 2008). Studies wherein authors examined a limited number of the adolescents' injury risk and protective factors either locally or across countries are frequent. In most of such studies, researchers combined intentional and unintentional injury in a single variable (de Looze et al., 2011; Pickett, Iannotti, Simons-Morton, & Dostaler, 2009; Pickett et al., 2005; Ranney, et al., 2009; Walsh et al., 2013). However, research conducted in which authors focused on assault-injury etiology and/or dimensionality are absent in youth assault-injury literature. In order to complete the picture of youth assault-injury in the United States, an overview of the demographics of risk and protective behaviors as they pertain to youth assault-injury appears to be necessary.

Physical activity has significant lower values among groups of adolescents with high involvement in diverse problem behaviors compared with nonviolent groups (Sullivan, Childs, & O'Connell, 2010). The relationship between physical training and youth violence was inconsistent among relevant studies; researchers reported contradictory results about the likelihood of the effects of weekly physical activity on violent and other problem behaviors among various races and between both genders (Childs, 2014; Sullivan et al., 2010; Swahn & Donovan, 2005). However, research is lacking about the relationship between weekly physical activity and youth assault-injury.

The Youth Risk Behavior Surveillance System (YRBSS) monitors various behaviors that relate to the leading causes of death among American youth at Grades 9 to 12. According to the national results of YRBSS, in 2013, the prevalence rate of students who have not participated in at least 60 minutes of physical activity on any of the 7 days prior to the survey was 15.2%. In the same year, 47.3% of students participated in at least 60 minutes of physical activity for 5 days during the week prior to the survey (Kann et al., 2014). Neither rate changed significantly from 2011. In 2011, 13.8% of students had not participated in physical activity, and 49.5% of students played active sports for at least 60 minutes on 5 days during the week prior to the survey (Kann et al., 2014). In 2013, 19.2% of female and 11.2% of male students, nationwide, had not been physically active on any day of the week preceding the YRBSS survey. Nationally, the prevalence rate of physically active students was 57.3% among males and 37.3% for females in 2013.

Carrying and/or use of weapons are persistent predictors of youth assault-injury, which, in return, predicts carrying and/or use of weapons (Cunningham et al., 2011; 2014; Thurnherr, Michaud, Berchtold, Akré, & Suris, 2009). According to YRBSS, in 2011, the overall prevalence rate of having carried a weapon was 16.6% among American students (Kann et al., 2014). In 2013, 17.9% of all students, 28.1% of males and 7.9% of females reported having carried a weapon at least on 1 day during the 30 days prior to the survey (Kann et al., 2014). In the same year, this prevalence was 33.4% among White, 18.2% among African American, and 23.8% among Hispanic male students. Among female students, 8.3% of White, 7.2% of African-American, and 7.7% of Hispanic students had carried a weapon on at least 1 day in the 30 days before the survey (Kann et al., 2014). The prevalence rate of having been threatened or injured with a weapon on school property one or more times during the 12 months before the YRBSS survey was 6.9% in 2013.

The correlations, if any, between risky sexual behavior and youth assault-injury remain unknown, given the lack of research in which authors examined such relationships. In studies wherein researchers focused on the PBS, they observed relationships between aggression, which included assault-injury and/or fighting and risky sexual behaviors (Childs, 2014; Chun & Mobley, 2010; Sullivan et al., 2010). In the United States, in 2011, 12.9% of sexually active students reported not using any method of birth control including a condom, by either sexual partner, during the last sexual encounter (Kann et al., 2014). In 2013, this rate was 13.7% among sexually active students. In the same year, 15.7% of females, 11.5% of males, 15.9% of African-Americans, 19.7% of Hispanics, and 11.1% of Whites reported not using any method of birth control, by either partner, during their last sexual encounter (Kann et al., 2014). The prevalence of this behavior was 21.2% among African American female students and 23.7% among Hispanic female students in the same year (Kann et al., 2014).

Nationwide, in 2013, 15.0% of students in Grades 9 to 12 reported that they had sexual intercourse with four or more persons in their lifetime (Kann et al., 2014). The rate of such behavior was 15.3% in 2011. In 2013, 16.8% of male, 13.2% of female, 26.1% of African American, 13.4% of Hispanic, and 13.3% of White students reported having multiple sexual partners (Kann et al., 2014). The highest prevalence, 37.5%, was among African American male students who reported having had sexual intercourse with four or more persons in their lifetime (Kann et al., 2014).

Delinquency reflects adolescents' predisposition toward high-action risk-taking behavior. Delinquent behaviors were inconsistently correlated with youth violence in relevant research (Henry et al., 2012; López & Emler, 2011). Again, studies are few in which researchers examined the relationships among delinquent behaviors and youth assault-injury.

In 2011, two of each five gang members in the United States were under 18 years old (National Gang Center, 2011). In the same year, nationwide, juvenile courts processed 1,236,200 cases of delinquency: 39.4 delinquency cases per 1,000 juveniles in the population. Thirty-six percent of these cases were crimes against property, 26%

against persons, 26% public order offenses, and 13% drug offenses (Hockenberry & Puzzanchera, 2014). In 2013, the YRBSS national results illustrated that someone offered, sold, or gave drugs on school property for 22.1% of students (24.5% of males and 19.7% of females) during the year prior to the survey (Kann et al., 2014).

Aggression is the most persistent predictor of assault-injury (Cunningham et al., 2014; Dukes et al., 2010; Ranney et al., 2011; Wiebe, Blackstone, Mollen, Culyba, & Fein, 2011). In 2013, in the United States, 30.2% of male and 19.2% of female students reported having been in a physical fight at least once during the year prior to the YRBSS survey. These rates total to 24.7% of students nationwide: almost one in four students (Kann et al., 2014). From the YRBSS results, 37.7% of African-Americans, 20.9% of Whites, and 28.4% of Hispanic students reported having been in a physical fight during the year preceding the survey. The prevalence of engagement in a physical fight decreased from 32.8% in 2011 to 24.7% in 2013 (Kann et al., 2014).

Cigarette smoking is a problem behavior that mutually occurs and correlates with other problem behaviors in adolescence. The adolescents' engagement in one problem behavior increases the likelihood of their engagement in other problem behaviors (Childs, 2014; Jessor & Turbin, 2014). Cigarette smoking is a risk behavior that contributes to predisposing adolescents toward engagement in other problem behaviors (Chun & Mobley, 2010; Mobley & Chun, 2013; Sullivan et al., 2010).

According to the 2013 YRBSS, during the 30 days before the survey, 15.7% of American students had smoked cigarettes on at least 1 day (Kann et al., 2014). Among these adolescents, 8.6% had smoked more than 10 cigarettes per day. This prevalence is slightly higher than the 7.8% prevalence of smoking 10 or more cigarettes per day among students in 2011. In 2013, 10.9% of male, 6.3% of female, 10.6% of White, 2.9% of African Americans, and 5.1% of Hispanic students reported smoking 10 or more cigarettes per day (Kann et al., 2014).

Marijuana use is an inconsistent predictor of aggression (e.g., engagement in physical fights) but does not correlate with youth assault-injury (Cunningham et al., 2011, 2014; Mercado-Crespo & Mbah, 2013; Walton et al., 2009; White, Fite, Pardini, Mun, & Loeber, 2013). Since aggression is a consistent predictor of youth assault-injury (Dukes et al., 2010; Ranney et al., 2011; Wiebe et al., 2011), the contradictory results in regard to the relationships between marijuana use and aggression and youth assault-injury seems confounding.

In 2013, in the United States, 23.4% of students reported marijuana use at least once during the 30 days prior to the YRBSS survey. Twenty-five percent of male, 21.9% of female, 28.9% of African American, 27.6% of Hispanic, and 20.4% of White students reported marijuana use in the 30 days prior the YRBSS survey in 2013 (Kann et al., 2014).

Using hard drugs positively correlates with youth aggression and recurrence of assault-injury (Cunningham et al., 2014; Rudatsikira et al., 2008). According to YRBSS results of 2013, 5.5% of students reported having used some form of cocaine, 7.1% reported having used hallucinogenic drugs, 8.9% reported having used inhalants, 6.6% reported having used ecstasy, 2.2% reported having used heroin, 3.2% reported having used methamphetamines, and 1.7% reported having used a needle to inject an illegal drug into their body at least one time during their life (Kann et al., 2014).

Alcohol use and problem drinking are frequent risk behaviors during adolescence. During adolescence, drinking alcohol has positive and desirable outcomes for the adolescents' acceptance by peers and subjective sense of maturity (Jessor, 1991). Researchers found that only binge drinking and alcohol misuse, but not alcohol use, predicted youth assault-injury and violence (Linakis et al., 2009; Murphy et al., 2010). Nationwide, in 2013, almost one-third of American students had had at least one drink of alcohol during the 30 days preceding the YRBSS survey. For the same years, nearly one of each five students had had five or more drinks of alcohol in a row at least once during the 30 days prior the survey. In the same year, the prevalence of students who reported having 10 or more drinks in a row at least one time during the month before the survey was 6.1% (Kann et al., 2014).

Driving while intoxicated is a problem behavior that more likely exists with other problem behaviors including violence and aggression (Childs, 2014; Logan-Greene et al., 2010; Vassallo et al., 2007). Studies wherein researchers have examined the relationship between driving while intoxicated and youth assault-injury were absent in the literature I reviewed.

In 2013, nationwide, one of each 10 students reported that they had driven a vehicle, at least once, when they had been drinking alcohol during the month prior the YRBSS survey (Kann et al., 2014). Twelve percent of male, 7.8% of female, 11.6% of

Hispanic, 10.4% of White, and 6.2% of African American students reported this behavior in the same year for the same period.

Risky behavior while intoxicated entails adolescents' engagement in physical fights or having sexual intercourse while drunk or under the influence of alcohol. Fighting while intoxicated predicts youth assault-injury (Linakis et al., 2009; Sheppard, Snowden, Baker, & Jones, 2008). Having a sexual encounter while intoxicated correlates with carrying weapons and peer violence (Walton et al., 2011).

Nationwide, in 2013, almost one of each three students was sexually active. Among sexually active adolescents, 22.4% reported having drunk alcohol or used drugs before the last occasion of sexual intercourse (Kann et al., 2014). In the same year, the prevalence rate of having drunk alcohol or used drugs before last occasion of sexual intercourse was 25.9% among male and 19.3% among female students. Unfortunately, national recent data for the prevalence rate of adolescents' fighting while intoxicated are missing. Windle (2003) noted the Southern Illinois University statistics illustrated that in 2001, 31.8% of college students reported having gotten into a fight or argument after alcohol consumption.

Proper diet reflects adolescents' predisposition toward a healthy lifestyle. Healthy diet does not influence the problem behavior occurrence likelihood among adolescents (León, Carmona, & García, 2010; Sullivan et al., 2010). The effect of a healthy diet on youth assault-injury likelihood is unknown.

According to the YRBSS results, in 2013, 5.0% of American students reported not eating fruits or drinking 100% fruit juice and 6.6% reported not eating vegetables during the week prior the survey. In the same year, only one of each five students reported eating fruits and/or drinking 100% fruit juice and 15.7% of students reported eating vegetables at least3 times a day during the week prior the survey.

Dental hygiene also indicates adolescents' predisposition toward a healthy lifestyle but does not influence problem behavior likelihood (León et al., 2010; Sullivan et al., 2010). There is, however, a lack of research in which authors examined the relationship between dental hygiene and youth assault-injury. In the years from 2007 to 2010, 15.6% of American 6- to 19-year-olds had untreated dental caries (National Center for Health Statistics, 2014). In 2012, 82.3% of American 6- to 19-year-olds had visited a dental practice in the previous year (National Center for Health Statistics, 2014).

Using safety equipment might indicate adolescent's predisposition against risk-taking behavior. Failure to wear a helmet correlates to greater injury among adolescents (Buckley et al., 2012), but its influence on youth assault-injury remains unknown, given the lack of research into such relationships. In the United States, in 2013, 67.0% of students reported having ridden a bicycle. Among these adolescents, 87.9% indicated that they never or rarely wore a bicycle helmet during the year prior the YRBSS survey (Kann et al., 2014). This prevalence did not change between 2011 and 2013.

Wearing a seat belt reflects adolescents' compliance with societal norms and predisposition toward safe lifestyle. The relationship between wearing a seat belt and youth-assault-injury is unknown because of the lack of research. In the United States, the prevalence rate of students who reported having never or rarely worn a seat belt remained constant between 2010 (7.7%) and 2013 (7.6%; Kann et al., 2014). In 2013, the prevalence rate of having never or rarely worn seatbelt was 9.5% among African American, 9.5% among Hispanic, and 6.6% among White students (Kann et al., 2014).

Church attendance includes adolescents' involvement in faith-related activity, attendance at faith-based services, and various levels of religiosity. In the problem behavior theory, Jessor (1987) suggested the protective influence of church attendance on problem behavior likelihood. However, researchers illustrated contradictory results about the relationships between church attendance and youth violence but have not examined the relationship between church attendance and youth assault-injury (Baier, 2014; Resnick et al., 2004; Salas-Wright, Vaughn, Hodge, & Perron , 2012; Salas-Wright, Vaughn, & Maynard, 2014). Barna Group's (2010) reported that, in the United States, on a weekly basis, almost six of each 10 adolescents engaged in group faith-based activity.

School performance has bidirectional (risk and protective) influence on youth violence likelihood, but this influence is inconsistent among relevant studies (Bernat, Oakes, Pettingell, & Resnick, 2012; Henry et al., 2012). Although Jessor (1987) in the PBT assumes a protective influence of school performance on problem behavior likelihood, research in which authors examined the relationships between school performance and youth assault-injury is rare. In some such studies, school performance did not influence youth assault-injury likelihood (e.g., Cunningham et al., 2011).

In 2009, nationwide, only 32.0% of Grade 4 students and 30.0% of Grade 8 students were at or above the proficient level in reading. In the United States, for the same year, 33.0% of Grade 4 students and 33.0% of Grade 8 student were at or above the mathematics proficiency level. In the United States, almost three out of each four students graduated from 4-year high school in the school year 2008-2009 (U.S. Department of Education, 2011).

School connectedness relationship with youth assault-injury is unknown, but researchers reported influence of school connectedness on future violence likelihood (Herrenkohl et al., 2012).

In the present study, I focused on youth interpersonal violence-related/assault-injury, as distinct from self-inflicted, inmate violence-related, sexual assault, and unintentional/accidental injury. I also provided an inclusive list of theory-based risk and protective factors and examined their interrelations with youth assault-injury dimensionally. These aspects might have overcome researchers' combination of various types of injury in a single variable, their use of a limited number of risk and protective factors, and their failure to examine youth assault-injury etiology and dimensionality. My study may well be the first to examine an inclusive list of youth assault-injury's risk and protective behaviors in a nationally representative sample. My research results might enhance the understanding of youth interpersonal intentional/violence-related injury risk and protective factors.

Problem Statement

Assault-injury is one of the five leading causes of adolescent death in the United States (CDC, 2013a). Currently, youth violence is one of the significant public health problems (CDC, 2014a). Daily, in 2011, emergency departments in the United States treated an average of 1,938 physical assault-injuries of 10- to 24-year-olds. Such cases totaled 707,212 (CDC, 2012a). In the United States, on a daily average, 13 adolescents were victims of homicide in 2010 (CDC, 2012a). Despite public health efforts, prevalence of behaviors contributing to youth violence and nonfatal assault-injury has been constant from 2009 to 2011 (CDC, 2013b; Eaton et al., 2012). Given the seriousness of youth assault-injury, it is noteworthy that researchers have not examined youth assault-injury etiology and dimensionality in the United States in the past 10 years by using an inclusive list of risk and protective factors.

In the PBT, Jessor and Jessor (1977) suggested the influence of the interactions between the accumulation of risk and protective factors on the likelihood of problem behavior among adolescents. Jessor assumed that, during adolescence, problem behaviors interrelate and co-occur in a syndrome namely, the PBS. The PBT buttressed many studies in which authors focused on adolescent injuries (Cunningham et al., 2011; Walsh et al., 2013). There is evidence of this theory's applicability to adolescent problem behavior across cultures in the literature (Mobley & Chun, 2103; Vazsonyi et al., 2008; 2010; Willoughby et al., 2004). The co-occurrence of interrelated problem behaviors in a syndrome-like relationship is also well established in the literature (Childs, 2014; Chun & Mobley, 2010).

In youth assault-injury literature, researchers using the PBT lens focused on a limited number of risk behaviors and frequently overlooked protective behaviors (Cunningham et al., 2011; Linakis et al., 2009; Murphy et al., 2010). Researchers have also reported contradictory results about the correlations between many of the PBT's risk and protective factors (e.g., cigarette smoking, delinquency, school performance) and youth assault-injury (Cunningham et al., 2011; Morash & Stevens, 2010; Ranney et al., 2011; Resnick et al., 2004). It is unknown if the interactions between the categories of risk and protective behaviors' contributions to the variations of youth assault-injury explain these inconsistencies. Research is lacking on the relationships between many of the PBT constructs (e.g., risky sexual activity, risky driving, various illicit drug use, driving while intoxicated, church attendance, and youth assault-injury). The PBT, however, is not devoid of limitations.

Researchers who examined the one-dimension co-occurrence of problem behaviors reported that the PBS explained a limited proportion of the variation of problem behaviors; researchers' results illustrated that multidimensional structures explained a greater proportion of the variation of problem behaviors' co-occurrence (Dukes et al., 2010; Guilamo-Ramos et al., 2005; Martinez-pons, 2011; Willoughby et al., 2004). Research in which authors examined the multidimensionality of youth assault-injury is absent in the literature I reviewed.

Røysamb et al. (1997) empirically produced a multidimensional model for explaining the health-threatening and health-enhancing behaviors of the PBT by a second-order level of categories/factors. These categories are High Action, Addiction, and Protection. First-order relevant risk and protective variables compose each of these categories. Røysamb et al. developed this model to explain adolescents' health-related behaviors using a sample of Norwegian adolescents. However, the applicability of this model to youth assault-injury in the United States is unknown.

Purpose of the Study

My purpose in conducting this cross-sectional quantitative study using a representative sample of American adolescents from secondary data was to examine if the construct of Røysamb et al.'s (1997) multidimensional model applies to examining the American youth assault-injury underlying structure by comparing the variables of physical training, weapon carrying and use, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drug, problem drinking, alcohol misuse, car driving while intoxicated, risk behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing a seat belt, religiosity, school performance, and school attendance to assault-injury controlling for age, sex, race, and socioeconomic status (SES). My subsequent aim was to use the construct of the multidimensional model to examine the structure and patterns of the relationships between variables at the third-order level and categories at the second-order level and youth assault-injury.

Research Questions and Hypotheses

Research Question 1

Does the construct of the multidimensional model explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES?

Null hypothesis H_0: The construct of the multidimensional model does not explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES.

Alternative hypothesis H_a: The construct of the multidimensional model does explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES.

Research subquestion 1. Does the construct of the multidimensional model explain the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness and factors of High Action, Addiction, and Protection controlling for age, sex, race, and SES?

Null hypothesis H_{01}: The construct of the multidimensional model does not explain the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness and factors of High Action, Addiction, and Protection controlling for age, sex, race, and SES.

Alternative hypothesis H_{a1}: The construct of the multidimensional model explains the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness and factors of High Action, Addiction, and Protection controlling for age, sex, race, and SES.

Research Question 2

Is there a correlation between adolescent assault-injury likelihood and patterns of interactions among categories of High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race?

Null hypothesis H_{02}: There is no correlation between adolescent assault-injury likelihood and patterns of interactions among categories of High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

Alternative hypothesis H_{a2}: There is a correlation between adolescent assault-injury likelihood and patterns of interactions among categories of High action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

Theoretical Foundation

Both the behavior system from Jessor and Jessor's (1977) PBT and Røysamb et al.'s (1997) multidimensional model support my study. Constructing the PBT are three systems: perceived-environment, personality, and behavior. Within and among these systems is a dynamic interaction between interrelated sociopsychological, cognitive, and behavior variables. The overall dynamic interaction within and among the three systems determines the adolescent tendency toward or against engagement in problem behavior (Jessor, 1987).

According to Jessor (1987), two structures comprise the PBT's problem behavior system. The first structure is the problem behavior, which includes cigarette smoking, marijuana use, illicit drug use, alcohol consumption, problem drinking, risky driving, risky sexual behavior, and deviant and norm-violating behaviors. Conventional behavior, which is the second structure in the behavior system, encompasses expressions of the adolescent orientation toward society: religiosity (e.g., frequency of church attendance) and academic achievement. Jessor suggested that the occurrence of any one problem behavior increases the likelihood of occurrence of other problem behaviors in a syndrome of problem behavior. Jessor suggested that each of the two structures functions as a constraint on the other. In Chapter 2, I discuss in detail the three systems of the PBT.

In Røysamb et al.'s (1997) model, the aggregation of three levels of health-related behaviors constructs a hierarchal structure. The third level encompasses a bipolar factor, which includes a pole of health-threatening behavior and a pole of health-enhancing behavior. A second-order level includes the three factors/categories of: High Action, Addiction, and Protection behaviors. In this model, variables relevant to each of the second-order categories constitute a first-order level. Risk sports and action, physical training, car speeding, and motorcycle risk form the High Action category, while smoking, alcohol consumption, car driving while intoxicated, and risk behavior while intoxicated form the Addiction category. Proper diet, dental hygiene, using safety equipment, and wearing a seatbelt constitute the Protection category. To examine the Norwegian adolescents' health-related behaviors, Røysamb et al. (1997) developed this model using a list of variables that lacked illicit drug use, risky sexual activity, delinquency, and aggression variables. However, this model's applicability for examining the underlying structure of American adolescents' assault-injury is unknown.

Researchers have not examined the dimensionality of youth assault-injury, and they have not comprehensively examined the assault-injury's risk and protective factors according to the constructs, variables, and interrelations of the behavior system. Therefore, my use of the PBT and the multidimensional model with an adequate list of variables provided a better understanding of the youth-assault injury determinants and their structure.

Nature of the Study

My choice of quantitative survey cross-sectional design for my research fulfilled various requirements related to the research questions and the theoretical foundation. The quantitative design was suitable for answering my research questions and hypotheses, which entailed examining relationships among independent and dependent variables while controlling the covariate variables. This examination necessitated performing statistical analysis on the relationships among the study variables that were quantitatively measured (Creswell, 2013). I examined relationships among American adolescents' behaviors and a particular outcome in real-world settings without manipulation. Therefore, survey design seemed appropriate (Punch, 2014). Survey design allowed generalization of results to the study population (Creswell, 2013). The cross-sectional survey design, however, was not sufficient to establish causal relationships between variables (Frankfort-Nachmias & Nachmias, 2008).

My purpose was to examine the structure of risk and protective behaviors that underlie youth assault-injury. The main theoretical assumption, which buttressed this examination, was the co-occurrence of these behaviors. This co-occurrence necessitated using a cross-sectional, not longitudinal, design. Supporting my choice was the frequent use of cross-sectional survey design by researchers to examine the dimensionality of the PBS (Childs, 2014; Hair, Park, Ling, & Moore, 2009; Reingle, Jennings, & Maldonado-Molina, 2012; Sullivan et al., 2010; Willoughby et al., 2004). For testing the applicability of the construct of Røysamb et al.'s (1997) model to American youth assault-injury, my use of a design similar to Røysamb et al.'s study design (a quantitative cross-sectional design) seemed appropriate. Using cross-sectional designs, researchers have supported the multidimensionality of PBS but not youth assault-injury (Childs, 2014; Hair et al., 2009; Reingle et al., 2012; Sullivan et al., 2010). My use of quantitative observational cross-sectional design overcame earlier researchers' failure to examine the variation and the underlying structure of youth assault-injury comprehensively according to Jessor's (1987) problem behavior system constructs and interrelations. The cross-sectional design using secondary data did not require time and resources for collecting data. This method allowed the examination of the characteristics of a large population from a small number of individuals (Creswell, 2013).

In the present study, the three categories/factors of indicator variables--High Action, Addiction, and Protection--included the adolescents' problem and protective behaviors, which construct the behavior system in the PBT and the injury-related variables in Røysamb et al.'s (1997) multidimensional model. The High Action variables included physical training, carrying and use of weapons, delinquency, and aggression. The Addiction variables were cigarette smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, and risky behavior while intoxicated. The Protection variables were proper diet, dental hygiene, using safety equipment, wearing a seat belt, religiosity, school performance, and school connectedness. The component variable was youth assault-injury and the covariates were age, sex, race, and SES.

In my research, the physical training variable was the rate of active sport participation (e.g., baseball, softball, basketball, soccer, swimming, football) during the past week. The variable of carrying and use of weapons was sum score of four items that indicated whether the adolescent had carried and/or used a weapon in the past 12 months. The variable of risky sexual behavior included three questions that asked about the rate of condom use in sexual intercourse, the frequency of birth control use, and the number of sexual but not romantic partners in the past 12 months. I recoded each of these questions to a dummy variables that had three values: The value 2 indicated safe sexual behavior (e.g., using a condom in sexual intercourse all the time, using contraceptives all the time, and having one sexual partner in the past year) and 1 for all other rates of risky sexual behaviors (e.g., not using a condom all the time when the respondent has had sexual intercourse and having two or more sexual partners in the past year). The variable of risky sexual behavior was the sum score of the three dummy variables. The delinquency variable was a sum score of 12 delinquency items (e.g., theft, robbery, going into a house or building to steal something, and selling marijuana or other illicit drugs). A value of 0 on this scale indicated no engagement in any delinquent behavior and values 1 and greater reflected the frequency of the adolescent's engagement in one or more delinquent behaviors in the past 12 months. The aggression variable was an average score of two items of noninjurious and nonweapon-related violence. These two items reflected the frequency of the adolescent's involvement in a serious fight and/or group fights in the past 12 months (see Tables A1 and A2 for details about these variables).

The cigarette smoking variable was the rate of regular, daily cigarette smoking for 30 days during the past 12 months. For illicit drug use, five variables indicated the frequency of the adolescent's use of marijuana and other illegal drugs (e.g., heroin, cocaine, inhalants, and using needles to inject illicit drugs) during the past year. The problem drinking and alcohol misuse variable was a sum score of three items: the number of drinks the adolescent usually has each time he/she has had a drink in the past 12 months, the daily frequency of drinking five or more drinks at one sitting in the past 12 months, and the number of days the adolescent has gotten drunk or "very, very high" on alcohol in the past 12 months. The driving while intoxicated variable was a sum score of two items that indicated whether the adolescent's has driven a vehicle while intoxicated in the past 12 months. I operationalized the risky behavior while intoxicated variable by eight questions that addressed the frequency of adolescents' weapon carrying, involvement in a physical fight, and having sexual intercourse while drunk or under the influence of illicit drugs. The risky behavior while intoxicated was a sum score variable whereas the value of 0 indicated that the adolescent never engaged in risk behaviors while intoxicated in the past 12 months; the greater values indicated engagement in one to seven risk behaviors while intoxicated in the past 12 months (see Table A1 for details about these variables).

The variable of proper diet was a sum score of 21 dichotomous questions (yes or no) that addressed the previous day’s intake of various types of fruits, beans, vegetables, tofu, and nuts. The dental hygiene variable was one question that asked if the adolescent had a dental examination by a dentist or a dental hygienist in the past year. The variable of using safety equipment was a question, which marked the frequency of wearing a helmet when riding a bicycle in the past year. The variable of wearing a seatbelt was also one question, which addressed the frequency of an adolescent's wearing a seatbelt when riding in or driving a car.

The religiosity variable was a sum score variable that included values from 0 to 8. A value of 8 indicated that the adolescent never attended any religion-related activities and that he/she perceives religion as unimportant. Values of 5 to 7 reflected infrequent religion-related activities and/or the adolescent's perception of religion as somewhat unimportant. Values of 1 to 4 indicated frequent religion-related activities and/or the adolescent's perception of religion as important (see the measures section in Chapter 4 for explanations about the adjustment of this variable). School performance was sum scores of the adolescent's grade-point in English, math, science, and history. The variable of school connectedness was a sum score of the adolescent's agreement or disagreement with feeling close to people at school, feeling a part of the school, feeling happy at school, feeling that teachers treat students fairly, and feeling safe at school (see Table A1 for details about these variables).

The youth assault-injury variable was a sum score of five items that indicated whether the adolescent has experienced any weapon-related and physical fight-related injury during the past 12 months. The age variable was the adolescents' calculated age. The sex variable was the respondents’ report of their biological sex, either male or female. The race variable included the adolescents' report of whether they were of one of the following: Hispanic or Latino origin, White, Black or African American, American Indian or Native American, Asian or Pacific Islander, or other. The variable of SES was an average score of five questions; two questions asked about the education level of the mother and father with whom the adolescent lives, two concerned the occupation of the residential mother and father, and one was a sum score of two questions that asked if either the residential mother or father receives public assistance, such as welfare (see Table A1 for details about these variables). Chapters 3 and 4 include a detailed explanation of the study's variables and the items that I used for operationalizing these variables.

In my research, I used data from the 1996 National Longitudinal Study of Adolescent to Adult Health (Add Health) Wave II in-home interview survey (Harris, 2009). These data included a representative sample of American adolescents in 1996 that enrolled in Grades 7 to 11 in the school year 1994-1995 (Harris, 2009). Add Health is a longitudinal study that started in 1995 and is still proceeding. Add Health researchers have collected data in four Waves since 1995.

In Wave I in 1995, Add Health researchers used stratified random sampling techniques, with probability proportion to size, to select 80 high schools that had Grade 11 students and a minimum enrollment of 30 students (Harris et al., 2009). Except for the high schools that have Grades 7 and 8, researchers also randomly selected a feeder school that offers Grade 7 and sends at least five students to high school annually for each high school and replaced schools that declined to participate. These sampling procedures resulted in the selection of 132 schools with enrollment of less than 100 to over 3,000 students in 80 different areas across the United States (Harris et al., 2009).

From the 132 schools, researchers collected data from students in Grades 7 to 12 who were attending school at the interview administration dates during the period

September 1994 to April 1995. The total sample of this in-school self-administered survey was 90,118 students. These students, in addition to students who did not complete the questionnaire but were in the school roster, composed the sample frame for the core sample of Wave I in-home interview survey (Harris et al., 2009).

After cross-stratifying the sample frame by grade and sex, researchers randomly selected 17 students from each stratum at each school (almost 200 students from each pair of schools). This selection produced the study's Wave I core sample of 12,105 adolescents: a nationally representative sample of adolescents enrolled in Grades 7 to 12 in U.S. schools in the school year 1994-1995. In addition to the core sample and according to the students’ responses to the in-school survey, researchers generated special oversamples of various ethnicities, disabled students, genetic sample of twins and siblings, and students' social network (saturation).

Researchers collected data for Wave II between April and August 1996. In this wave, researchers conducted in-home interviews with 14,738 participants. This sample included adolescents who were in Grades 7 to 11 in Wave I, the adolescents in Grade 12 who were in the genetic and adopted samples, and an additional small number of participants who did not contribute in Wave I. Adolescents ≤ 18-years-old in the core sample of Wave II compose the sample of the present study.

For each in-home interview, after contacting a parent or legal guardian, from those who agreed to participate, researchers obtained written informed consent forms from a parent or legal guardian and the adolescent. Researchers collected the data using a computer-assisted personal interview (CAPI), audio computer-assisted self-interview

(ACASI) and a computer-self-administered audio CASI portion for the sensitive health and risk behavior questions.

The Add Health instrument that was similar to that used for collecting Waves I and II in-home interview data, included scales, multi-item composites, and individual characteristics. Add Health researchers developed the various measurements of the instrument using different approaches. For the scales, researchers used a deductive construct-orientation approach based on theory. They randomly split the final sample of Wave I into two halves: an exploratory sample for constructing the multi-item scales empirically and a validating sample for cross-validating the scales' internal consistency. They reported appropriate internal consistency reliability estimates of the majority of scales (Sieving et al., 2001). For the multiitem composites, researchers developed these measures "from items following logical skip patterns, whereby participants who gave a negative response to an initial question did not answer remaining questions in that section" (Sieving et al., 2001, p.76). Researchers did not measure internal consistency reliability estimates for the multi-item composites in the instrument.

For dealing with data and describing the demographic characteristics of the sample, the distribution of the study variables, and the frequency and percentages of assault-injury and the risk and protective behaviors in the sample, I planned to use the Statistical Package for Social Science (SPSS) software descriptive statistics. For answering the first research question and first subquestion, taking into account the complexity of data, I planned to use the IBM analysis of moment structure (AMOS) for dealing with data and conducting structural equation modeling (SEM). After receiving the data, I selected different software (i.e., STATA 14 and linear structural relations (LISREL) 9.2) for dealing with data and conducting the statistical tests since AMOS was not compatible with complex survey design. I used SEM for, simultaneously, examining the complex and multidimensional interrelationships and paths among my study's set of variables that had different measurement levels (See Tables 1and 2 for details about the study's indicator, component, and control variables). SEM provides a graphical interference and ability to fit even nonstandard models (nonnormally distributed and incomplete data). Using SEM, I concurrently tested overall model fit and individual parameter estimates. I added reciprocal paths between each pair of the three categories/factors: High Action, Addiction, and Protection and examined the influence of their interactions on assault-injury for answering the second research question (see Figures B1 and B2 for graphical depiction of the theoretical models). I discuss in detail the data analysis plan in Chapter 3.

The Operational Definitions

Aggression: The engagement in a physical fight and/or engagement in a serious fight (Chun & Mobley, 2010; Pickett et al., 2009).

Carrying and *use of weapons*: The action of having carried any weapons in the past 12 months (e.g., firearm, bat, or knife). Weapon use is using any of these weapons in a fight (Thurnherr et al., 2009).

Cigarette smoking: The frequency of smoking in the past year (Cunningham et al., 2011).

Church attendance: The adolescent's perceptions of the importance of religion, participation in religious services, and involvement in faith-based activities (Sinha, Cnaan, & Gelles, 2007).

Delinquency: The conduct of one or more of the following: painting graffiti or signs on other people's or public properties; deliberately damaging other people's properties; lying to parents; running away from home; taking something from a store without paying for it; driving a car without its owner's permission; theft; robbery; going into a house or building to steal something; selling marijuana or other drugs; acting loud, rowdy, or unruly in a public place; and having been initiated into a named gang (Cunningham et al., 2006; Herrenkohl et al., 2012; López & Emler, 2011; Swahn & Donovan, 2005).

Dental hygiene: A yearly dental examination by a dentist or a dental hygienist (McEachan, Lawton, & Conner, 2010).

Driving while intoxicated: Operating a motor vehicle while under the influence of an alcoholic beverage, marijuana, or controlled drugs (Texas Department of Transportation, 2014; Zakletskaia, Mundt, Balousek, Wilson, & Fleming, 2009).

Hard drug use: The frequency of using any illegal drugs, such as heroin, ecstasy, glue, mushrooms, speed, ice, heroin, pills, cocaine, and so forth (Cunningham et al., 2011; Rudatsikira et al., 2008).

Marijuana use: The frequency of marijuana use in the past year (Cunningham et al., 2010; Salas-Wright et al., 2012).

Physical training: The time spent in sports per week (Røysamb et al., 1997).

Problem drinking and alcohol misuse: The drinking frequency, quantity, binge drinking in the past year, and/or having being drunk at least once in the past 30 days (Thurnherr et al., 2009; Walton et al., 2009).

Proper diet: The previous day's intake of various types of fruits, beans, vegetables, tofu, and nuts (CDC, 2014e; Mulye et al., 2009; León et al., 2010; Sullivan et al., 2010).

Race: The social categories that the U. S. government uses to obtain information about segments of the society. These categories denote origin, but not biological characteristics.

Risky behavior while intoxicated: The frequency of adolescents' weapon carrying, involvement in a physical fight, and having sexual intercourse while drunk or under the influence of illicit drugs (Sullivan et al., 2010; Thurnherr et al., 2009).

Risky sexual behavior: The actions of having one or more unprotected sexual encounters, not using any birth control method in the past 12 months, and having two or more sexual partners (Childs, 2014).

School connectedness: The adolescent's feeling close to people at school, feeling a part of the school, feeling happy at school, feeling that teachers treat students fairly, and feeling safe at school (Bernat et al., 2012).

School performance: The adolescent's grade-point average for English, math, science, and history (Bernat et al., 2012; Herrenkohl et al., 2012).

Socioeconomic status (SES): A score of parents' occupation, education, and income (Schlack et al., 2013).

Using safety equipment: The frequency of an adolescent's wearing a helmet when riding a bicycle (Buckley et al., 2012).

Wearing a seatbelt: The frequency of an adolescent's wearing a seatbelt when riding in or driving a car (Mulye et al., 2009).

Youth assault-injury: Any weapon-related and physical fight-related injury and injury from being physically attacked and physically attacking someone (Cunningham et al., 2011).

Assumptions

Since I used secondary data that other researchers have collected in the past, it was necessary to make several assumptions, including the presumption that adolescents who participated in the Wave II in-home interview answered all the questions accurately. This assumption was probably true since the participation in Add Health was voluntary and followed obtaining informed consent forms from a parent and the adolescent. The informed consent forms were presumed to inform the adolescent about data confidentiality and anonymity, thus enhancing the adolescent's truthful responses. It was also assumed that the interview settings, which entailed using a CAPI, ACASI and a computer-self-administered audio CASI portion for the sensitive health and risk behavior questions, actually did minimize the influence of the interviewer on the adolescent's responses. This assumption may have being true since Chang and Krosnick (2010) reported less social desirability response bias in computer-self-administered compared with a telephone interviewing method. It was also assumed that the Add Health instrument measured the study variables appropriately. This assumption may have being true taking into account the Add Health researchers used various approaches to developing the instrument (Sieving et al., 2001).

Scope and Delimitations

In my study, I used the structure of Røysamb et al.'s (1997) multidimensional model that was based on the problem behavior system of the PBT as a theoretical foundation (see Figures 1to 6 for a graphical depiction of the structure). I measured, dimensionally, the correlations and patterns of the relationships among physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing a seatbelt, religiosity, school performance, and school connectedness, and youth assault-injury while controlling for age, sex, race, and socioeconomic status. I also examined if the categories/factors of High Action, Addiction, and Protection, at the second-order level of the underlying structure of youth assault-injury, interact and whether this interaction influences youth assault-injury likelihood. In the present study, my focus was on individual behavior, not on demographic characteristics or on the influential factors at the other levels of socioecological environment. This focus on individual behavior system necessitated the exclusion of the other two systems in the problem behavior theory: perceived environment and personality (Jessor & Jessor, 1977).

The sample of the present study was limited to 1996 American students, that is., 11- to 18-year-olds who were enrolled in school during the school year 1995-1996. One boundary of the present study sample was the Add Health researchers' exclusion of hospitalized, dropout, home-schooled, and American adolescents living outside of the United States from the sample. Another boundary was the date of the Wave II data collection: 1996. These two boundaries restricted the generalization of the present study results. The characteristics of adolescents, their behaviors, and the social and economic context of this study's participants might differ from those of their counterpart adolescents now. Therefore, although the present study sample was representative of American adolescents in 1996 who were enrolled in school during the school year 1994-1995, the generalization of the study results should be limited to the same population at the same period of time.

Limitations

The cross-sectional survey design brought various limitations to the present study. The cross-sectional survey design allowed examining correlations, but not causation, among the study variables. The internal validity of such a design is weaker than designs with control or comparison groups (Creswell, 2013). Survey cross-sectional design does not allow determining the timing sequence of the relationships among variables. In other words, it remains unknown which occurred first, assault-injury or the indicator variables. Regardless of these limitations, the cross-sectional survey design was suitable for the present study since my aim was to examine interrelationships, but not causation, among variables that, according to the theoretical assumptions, co-occur in real world settings.

Despite the advantages of using secondary data, this use prevented me from acquiring additional experience in instrument development and data collection. Using secondary data also restricted the present study to the parent study's variables, instrument and measures, and data collection approach. For instance, I excluded the variable of speeding in cars because it was missing from the data set. Moreover, the variable of dental hygiene did not reflect the adolescents' daily dental hygiene conduct because additional items to measure dental hygiene were missing. Using this one item threatened the validity and reliability of this measure and made interpreting the results about this variable highly questionable. The patterns of excluding respondents in the items that constructed the variable of risky sexual behavior resulted in concentrating the category 15 to 18 year-olds (40% of cases) in the values that were higher than zero and the category of 11 to 15 year-olds (60% of cases) in the zero values of the variable items. The influence of grouping age categories on the study's findings in regard to the association among assault-injury, the three latent factors, and risky sexual behavior remains unknown.

For the variables in the present study, my estimate of Cronbach's alpha indicated good levels of internal consistency of the study's measures. My use of the sampling weight variables (Chen & Chantala, 2014) eliminated the sampling design effect on the parameter estimates and standard errors.

In addition to the lack of information about the instrument's convergent, discriminant, and concurrent validity, various factors also may have contributed to increasing the probability of inaccuracies of this study's data. The first factor was the likelihood of investigators and respondents' personal bias during in-person interviews. Add Health researchers used a computer-self-administered audio CASI portion for the sensitive health and risk behavior questions. It was assumed that this approach might have minimized the influence of the interviewer on the adolescent's responses. The second factor was the incomplete development of the person's cognitive system during adolescence. Adolescents' responses to sensitive questions relate to their level of maturity, their perception of behaviors either as risk or normative, and their perception of consequences that may result from reporting these behaviors. The third factor was the potential recall bias in the data since, except for the questions on illicit drug use and diet, all questions about risk behaviors required a 12-month recall period.

The fourth factor was that the Add Health Wave II in-home survey was a follow-up of Wave I, with the same participants using almost identical questionnaires. In the Add Health website and related literature, information was lacking about the testing effects on Wave II responses. In addition to the above factors, social desirability and random measurement error may have influenced data accuracy. Since I used no other sources of data, it was hard to determine the extent to which the above factors influenced data accuracy. However, my large sample size n = 12,623 minimized the potential impact of the former factors on data accuracy and maximized data precision including the accuracy of parameter estimates and standard errors. Finally, response bias was less likely to affect study results because of the high response rate of 88.6% in Wave II.

In LISREL, the R-squared of indicator variables cannot be interpreted; it does not indicate the relative variance of these variables (Jöreskog, 1999). LISREL also did not allow calculating the variance of assault-injury. Accordingly, the amount of variance of the observed variables in both the recursive model and nonrecursive model remain unknown. LISREL did not allow the calculation of the effect size of the interactions among latent factors through the reciprocal paths. Although excluding the path between Addiction and High Action, all structural paths were statistically significantly nonzero; the actual effect sizes of these factors on each other remain unknown.

Although the present sample size, the statistical test significance and power levels, and the measures that I used maximized the data precision, the ability to generalize the present study results is highly questionable because of the data collection date and because gender, age, race, and SES influence the likelihood of youth assault-injury and its risk and protective factors (Cunningham et al., 2011; Melzer-Lange, Van Thatcher, Liu, & Zhu, 2007; Ranney et al., 2009; Simpson, Janssen, Craig, & Pickett, 2005). Without further research, the applicability of the construct of the multidimensional model to current American adolescent groups of females and males, various races, different age categories, and varying socioeconomic levels remains unknown. Another limitation is my focus on the individual behavior system that entailed excluding the perceived environment and personality constructs that comprise the PBT. The proportion of youth assault-injury's variation that these two constructs may explain and the influence of their exclusion on the study results remain unknown and require further studies.

Significance of the Study

Increased knowledge gained from this study may contribute to expanding the behavior system of the PBT and its application to adolescents' assault-injury. For researchers, this study provided an innovative approach to examining, in depth, youth risk of assault-injury. My study also provided evidence of associations between youth assault-injury and various risk and protective behaviors; these behaviors were missing in research on youth assault-injury. Moreover, public health practitioners may use the results regarding the influence of interactions among factors/categories of High Action, Addiction, and Protection as critical intervention and control areas for reducing youth assault-injury and its risk factors prevalence rates. Consequently, the present study might indirectly contribute to positive social change by decreasing the adolescents' morbidity, disability, and mortality. Taking into account the frequency of tragic events of weapon use on school properties in the United States and their adverse consequences on society and youth, this study’s results may contribute to protecting the lives of youth in the United States. Positive social change could also result from directing youth energy toward success, by addressing the adolescents' violent behaviors. Supporting adolescent safety allows their active contribution in developing their lives and surroundings.

Summary and Transition

In this chapter, I discussed in detail the background of youth assault-injury in the United States. In the background section, I provided a historical overview of the events that led to the establishment of the scientific discipline of youth violence. I also highlighted the significance of youth assault-injury and presented the demographics of its risk and protective factors in the United States. I briefly discussed the gaps in the relevant literature to emphasize the need for the present study. I then introduced the problem statement and my purpose in conducting my research. In this chapter, I introduced my research questions and hypotheses. I briefly explained the theoretical foundation for my study; that foundation included the PBT and the structure of the multidimensional model. I presented justification for using a cross-sectional survey design using secondary data from Add Health Wave II and explained data sampling and recruitment procedures of the parent study. I briefly described the data analysis plan that I used to answer my research questions and test the hypotheses. In this chapter, I introduced a list of the terms and operational definitions of the variables as they pertained to my study. I discussed a number of assumptions relating to the data accuracy, my research scope and delimitations, and I highlighted the study limitations and the potential contribution of study results to positive social change. A discussion of research approaches to examining youth assault-injury and its risk and protective factors in the literature seemed necessary to highlight the gaps that establish the need for the present study. Chapter 2 included a comprehensive overview of youth violence and assault-injury literature.

Chapter 2: Literature Review

Assault-injury is one of the five leading causes of adolescent death in the United States (CDC, 2013a). In the United States, currently, youth violence is one of the significant public health problems (CDC, 2014a). In 2011, at a daily average, emergency departments in the United States treated 1,938 physical assault-injuries of 10- to 24-year-olds. Such cases totaled 707,212 (CDC, 2012a). Despite the public health efforts to reduce adolescent injury, prevalence of behaviors contributing to youth violence and nonfatal assault-injury has been constant from 2009 to 2011 (CDC, 2013b; Eaton et al., 2012). Given the seriousness of youth assault-injury, it is noteworthy that researchers have not examined youth assault-injury etiology and dimensionality in the United States by using an inclusive list of risk and protective factors in the past 10 years.

The PBT of Jessor and Jessor (1977) explicitly or implicitly buttressed many studies in which authors focused on adolescent injuries (Cunningham et al., 2011; Pickett et al., 2005; Walsh et al., 2013). In this theory, Jessor and Jessor suggested the influence of the interactions between the accumulation of risk and protective factors on the likelihood of problem behavior among adolescents. There is evidence of this theory's applicability to adolescent problem behavior across cultures in the literature (Mobley & Chun, 2013; Vazsonyi et al., 2008; 2010; Willoughby et al, 2004). In youth assault-injury literature, researchers using PBT lens focused on a limited number of risk behaviors, whereas less emphasis was given to protective behaviors (Cunningham et al., 2011; Linakis et al., 2009; Murphy et al., 2010). Researchers have also reported contradictory results about the correlations between many of the PBT's risk and protective factors (e.g., cigarette smoking, delinquency, school performance) and youth assault-injury (Cunningham et al., 2011; Morash & Stevens, 2010; Ranney et al., 2011; Resnick et al., 2004). It is unknown if the interactions between the categories of risk and protective behaviors' contributions to the variations of youth assault-injury explain these inconsistencies. There is, however, a lack of research into the relationships between many of the PBT constructs including risky sexual activity, risky driving, various illicit drug use, driving while intoxicated, church attendance, and youth assault-injury.

Røysamb et al. (1997) proposed a multidimensional model for explaining the health-threatening and health-enhancing behaviors of the PBT by a second-order level of categories/factors. These categories are High Action, Addiction, and Protection. First-order relevant variables compose each of these categories. Risk sports and action, physical training, car speeding, and motorcycle risk compose the High Action category while smoking, alcohol consumption, car driving while intoxicated, and risk behavior while intoxicated compose the Addiction category in this model, and physical training, proper diet, dental hygiene, using safety equipment, and wearing seat belts constitute the Protection category. Røysamb et al. developed this model to explain adolescents' health-related behaviors using a sample of Norwegian adolescents. The applicability of this model to adolescents' assault-injury in the United States is unknown.

Accordingly, my purpose in conducting this cross-sectional quantitative study using a representative sample of American adolescents from secondary data was to examine if the construct of Røysamb et al.'s (1997) multidimensional model applies to examining the American youth assault-injury underlying structure by comparing the variables of physical training, weapon carrying and use, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking, alcohol misuse, car driving while intoxicated, risk behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing a seat belt, religiosity, school performance, and school connectedness to assault-injury controlling for age, sex, race, and SES. My subsequent aim was to use the construct of the multidimensional model to examine the structure and patterns of the relationships between variables at the third-order level and categories at the second-order level and youth assault-injury.

In this literature review, I summarize and synthesize the available scientific knowledge on youth violence and assault-injury to highlight the conflicting results and conclusions and address limitations in youth violence and assault-injury studies. This literature review also focused, in part, on the multidimensional model of Røysamb et al. (1997) and the PBT of Jessor (1987) as they apply to adolescent assault-injury. This review positioned the present study in the youth assault-injury scientific context. At the beginning of this chapter is a description of the literature search strategy. Next is the theoretical foundation that includes an overall description of the PBT, and a detailed representation of the PBT's behavior system constructs and the multidimensional model. Next are a literature review of key concepts and a literature review of key variables including extensive discussion of studies in which researchers examined youth assault-injury's risk and protective factors and covariates. Last, there is a summary and transition.

Literature Search Strategy

In my literature search, I used the following databases: ProQuest Nursing & Allied Health Source, ProQuest Health & Medical Complete, ScienceDirect, CINAHL Plus with full text, PsycARTICLES, PsycINFO, SocINDEX with full text, ERIC Education Research Complete, American Journal of Preventive Medicine, SAGEpremier, and Google Scholar, which I linked to the Walden library. The search for youth assault-injury literature from 2009 to 2014 yielded only 17 youth assault-injury studies in the United States, three in developing countries, and three in developed countries. Therefore, peer review abstracts and full text from 2004 to 2014 were added to the search criteria. The search keywords *adolescent* or *youth intentional injury* and *adolescent* or *youth assault-injury* yielded only seven additional relevant studies. The keyword's mismatch led to the use of *youth violence, youth violence AND protective factors*, *youth violence AND risk factors*, and *youth victimization* as alternative keywords. The search also included the use of these keywords: *problem behavior theory*, *problem behavior theory AND intentional injury*, *problem behavior theory AND Jessor*, and *problem behavior syndrome*. My examination of references yielded additional studies appropriate to my research. This search generated hundreds of studies. Eliminating the studies that focused on youth inmate violence, sexual assault, self-injury, suicide, intervention evaluation research, and research on minority groups and groups with special needs reduced the quantity to 130 studies. My use of Mendeley software enabled me to organize the data into category folders that included *problem description*, *assault-injury, the variables,* and *the theory*.

Theoretical Foundation

Both the behavior system from Jessor and Jessor's (1977) PBT and Røysamb et al.'s (1997) multidimensional model supported my study. Constructing the PBT are three systems: perceived-environment, personality, and behavior. Among and between these systems is a dynamic interaction between interrelated sociopsychological, cognitive, and behavior variables. The overall dynamic interaction within and between the three systems determine the adolescent tendency toward or against engagement in problem behavior (Jessor, 1987). Apparent in the literature I reviewed is the applicability of the PBT to a number of adolescents' problem behaviors and applicability across cultures (Ciairano, Kliewer, & Rabaglietti, 2009; Chun & Mobley, 2010; Mobley & Chun, 2013; Vazsonyi et al., 2010). The co-occurrence of interrelated problem behaviors, namely PBS, is also well established in the literature (Childs, 2014; Chun & Mobley, 2010). Researchers who examined the one-dimension co-occurrence of problem behaviors reported that the PBS explained a limited proportion of the variation of problem behaviors; researchers' results illustrated that multidimensional structures explained a greater proportion of the variation of problem behaviors co-occurrence (Dukes et al., 2010; Guilamo-Ramos et al., 2005; Martinez-pons, 2011; Willoughby et al., 2004). Accordingly, Røysamb et al.'s multidimensional model might better explain the underlying structure of youth assault-injury.

In Røysamb et al.'s (1997) model, the aggregation of three levels of health-related behaviors constructs a hierarchal structure. The third level encompasses a bipolar factor, which includes a pole of Health-Threatening behavior and a pole of Health-Enhancing behavior. A second-order level includes the three factors/categories of behaviors, which are High Action, Addiction, and Protection. In this model, variables relevant to each of the second-order categories constitute a first-order level. Risk sports and action, physical training, car speeding, and motorcycle risk form the High Action category while smoking, alcohol consumption, car driving while intoxicated, and risk behavior while intoxicated compose the Addiction category in this model, and proper diet, dental hygiene, using safety equipment, and wearing a seatbelt constitute the Protection category. To examine the Norwegian adolescents' health-related behaviors, Røysamb et al. developed this model using a list of variables, which lacked drug use, risky sexual activity, delinquency, and aggression variables. This model‘s applicability for examining the underlying structure of American adolescents' assault-injury is unknown.

In youth assault-injury studies where researchers used the PBT lens, they often focused on a limited number of risk behaviors, combined intentional and unintentional injury, and/or overlooked the complexity and the potential multi-dimensionality of the assault-injury trajectory (de Looze et al., 2011; Pickett et al., 2005; Walsh et al., 2013). Studies in which authors used multidimensional approaches and a comprehensive list of risk and protective factors to explain the adolescents' problem behavior are rare in the literature. In such studies, researchers included assault-injury among the aggression variables, but their focus was on examining the co-occurrence of problem behaviors, not on assault-injury (Sullivan et al., 2010; Chun & Mobley, 2010).

Researchers did not examine the dimensionality of youth assault-injury, and they did not comprehensively examine the assault-injury's risk and protective factors according to the problem behavior' constructs, variables, and interrelations. Therefore, my use of the PBT and the multidimensional model with an adequate list of variables could provide better understanding of the youth-assault injury determinants and their structure.

The Problem Behavior Theory

Jessor (1987) noted his use of the initial PBT in his study of alcohol abuse among youth from three ethnicities in 1968. Jessor developed the PBT based on the anomie construct of Merton's (1957) strain theory and the value and expectation constructs of Rotter's (1954) social learning theory (Wanberg, Timken, & Milkman, 2020). The PBT's development and applications continued to support its feasibility in explaining substantial percentages of the variation of many of the adolescents' problems and health-related and pro-social behaviors (Ciairano et al., 2009; Jessor & Turbin, 2014; Mobley & Chun, 2013; Vazsonyi et al., 2010). Three main systems, namely the perceived-environment system, the personality system, and the behavior system, constitute the PBT's conceptual structure (Jessor & Jessor, 1977). Explanatory variables comprise each of these systems. These variables either control against or lead to problem behavior (Jessor, 1987). Jessor's (1987) identification of the groups of variables as *systems* relates to the dynamic of the interrelations between variables in each system, namely proneness. Proneness determines the adolescents' behavioral predisposition in favor of normative or problem behaviors. The overall proneness across the three systems establishes the degree of the adolescents' psychosocial proneness/risk to engage in problem behavior (Jessor, 1987).

In the theory's contextual framework, in addition to the three systems, Jessor included two domains, social structure and socialization. These domains, which became biology/genetics and social environment in later developments of the theory, have indirect influences on adolescent problem behavior likelihood (Jessor, 1991). Jessor (1987) suggested that the interactions between these domains and the risk and protective factors of the systems result in problem behavior. These interactions determine the adolescents' lifestyle, which in turn affect the adolescents' health and personal development.

In later developments of the theory, Jessor replaced *problem behavior* with *risk factor* and *conventional behavior* with *protective factor* in describing the theory's variables (Jessor & Turbin, 2014; Jessor, 1991). Jessor (1991) based this alteration on the epidemiological extension of the disease risk factors to include risks on the social environment and behavior levels. Jessor also argued that the definition of *risk* should extend to include not only the problem behavior influence on health but also its social, personal, and psychological consequences. Jessor called for epidemiological psychosocial reformation of *risks* to include both adverse and desirable consequences. For instance, in addition to its adverse consequences on health, cigarette smoking has positive and desirable outcomes for the adolescents' acceptance by peers and subjective sense of maturity.

In the PBT, social control, models, and support variables compose the perceived-environment system. According to their indirect or direct influence on the behavior, Jessor (1987) distributed these variables on two distinct structures: distal and proximal.

Characterizing the contextual orientation of the adolescents (family-oriented vs. peer-oriented), variables of parental and peer influence and parental and peer support and controls compose the distal structure. Jessor noted the need for theoretical links to explain these variables' indirect influences on adolescent behavior. Social controls and societal exposure to models and supports of the problem behavior compose the proximal structure and directly influence the adolescent behavior. Through models and support, the variables in the proximal structure characterize the social acceptance and support and the existence of the problem behavior in the adolescents' social context (Jessor & Jessor, 1977).

Interrelated variables at the sociocognitive level compose the personality system of the PBT. The variables of the adolescents' perceptions (e.g., beliefs, attitudes, expectations) of self and others constitute three structures in this system: motivational instigation, personal belief, and personal control (Jessor & Jessor, 1977). The motivational instigation structure reflects the adolescents' view for or against engaging in the problem behavior. In this structure, Jessor (1987) suggested three goals highly related to problem behavior: academic achievement, independence, and peer affection. According to Jessor, the adolescents' perceptions of the value of any of these three goals and the adolescents' expectations of achieving the goal are motivational resources, along with pressures, initiate the problem behavior. Distal from the problem behavior in the personality system is the personal belief structure, which is a control structure, based on belief. This structure includes the adolescents' self-orientation toward the societal norms and values. Proximal to the problem behavior, also in the personality system, is the personal control structure. This structure's variables reflect the adolescents' positions toward controlling against or tolerating and accepting the problem behavior (Jessor & Jessor, 1977). The existence of a combination of negative values, beliefs, and controls (e.g., small values on academic achievement, high alienation, low self-esteem, high tolerance of deviance) determines the personality proneness to problem behavior (Jessor, 1987).

Various important assumptions buttress the theory's behavior system. Jessor and Jessor (1977) assumed that adolescent behavior is a product of the interaction between the adolescent and the environment. According to Jessor and Jessor, the problem behavior is an act, which contradicts the norms, is unaccepted by society and authority institutions, and leads to different levels of social control reactions. Age and time are core factors in framing adolescent problem behaviors; an adolescent problem behavior may be an adult accepted behavior (e.g., drinking alcohol) and framing a behavior as a problem or normative might change over time. Independence, self-identification within the youth culture, tendency to maturity, taking control of one's life, and coping with frustration, failures, and anxiety may all manifest in problem behaviors. Jessor (1987) suggested that problem behaviors interrelate within the youths' social-psychological context. He argued that some adolescence settings allow practicing more than one problem behavior simultaneously and that different problem behaviors serve to achieve shared goals, such as the adolescent's subjective sense of maturity. The above assumptions support the two structures of the PBT's behavior system.

According to Jessor (1987), two structures compose the PBT's problem behavior system. The first structure is the problem behavior, which include smoking cigarettes, drinking alcohol, problem drinking, drug use, delinquent behaviors (e.g., lying, stealing, and aggressive behavior), and unprotected sexual intercourse. Conventional behavior, which is the second structure in the behavior system, encompasses expressions of the adolescent orientation toward society: religiosity (frequency of church attendance) and academic achievement. Jessor suggested that the occurrence of any one problem behavior increases the likelihood of occurrence of other problem behaviors in a syndrome of problem behavior. Jessor suggested that each of the two structures functions as a constraint to the other. The existence of different problem behaviors with low school performance and low church attendance illustrate the behavior system's proneness to engage in problem behavior (Donovan & Jessor, 1985; Jessor, 1987).

The PBT, however, is not devoid of limitations. For instance, although the correlations between problem behaviors exist, the magnitude of these correlations is not robust (Guilamo-Ramos et al., 2005). Guilamo-Ramos et al. (2005) noted these weak correlations in their systematic review of studies from 1977 to the end of 1999. Guilamo-Ramos et al. included studies where authors examined at least two problem behaviors, cited Jessor and Jessor's (1977) PBT, and reported statistical associations between the problem behaviors. Among the 43 studies that met the former criteria, Guilamo-Ramos et al. (2005) reported the average correlation between any pair of problem behaviors to be (M = .35, SD = .28). Guilamo-Ramos et al. argued that, among the coupled behaviors, each behavior explained a proportion that is equal to one minus the correlation.

Therefore, the unique behaviors, not the correlation, explained almost two thirds of the problem behavior variation.

Furthermore, in a recent study, Jessor and Turbin (2014) noted differences in risk and protective variables of the personality system's models and controls between problem behaviors (e.g., marijuana use) and pro-social behaviors (e.g., involvement in school activity), and they indicated a need for greater attention to protective behaviors. Jessor and Turbin called for research in which authors focus on the roles of specific protective and risk factors in the problem and prosocial behaviors' likelihood. Furthermore, Willoughby et al. (2004) showed a weak model fit of the PBS's single-factor model, which suggested co-occurrence of problem behaviors, compared to the good model fit of the three-factor model, which encompassed three latent factors: aggression, delinquency, and a factor of substance use and sexual activity. Willoughby et al. and other authors supported the dimensionality of problem behavior (Dukes et al., 2010; Martinez-pons, 2011). Because of the theory limitations and the potential dimensionality of the PBS, Røysamb et al.'s (1997) multidimensional model may better explain the structure and patterns that underlie youth assault-injury (as one of the youth problem behaviors).

The Multidimensional Model

Røysamb et al. (1997) noted the literature’s inconsistencies regarding the structures, which vary between multidimensional, bidimensional, and one-dimension of the arrays of risk and protective health-related behaviors. They also highlighted the lack of consensus on the dimensions' characteristics and contents. Accordingly, Røysamb et al. empirically examined a multilevel factor-model of adolescent health-related behaviors. Splitting the sample of 1,583 Norwegian adolescents into two independent sub-samples, Røysamb et al. conducted exploratory and confirmatory analyses on the first and second sample respectively in six steps.

In the first step, Røysamb et al. analyzed 22 risk-related behaviors, which increase or decrease the probability of injury, using an exploratory first-order principal component analysis (PCA) with oblique rotation. This test resulted in a seven-factor solution in the first sample. In the second step, using five of the LISREL 8 measures of fit, Røysamb et al. tested the seven-factor model against the data of the second sample and compared the model with one-dimension and bidimensional models. The statistical analysis illustrated better fit of the seven-factor model on the five measures compared to the one-dimention and bidimensional models.

In step three, on the first sample, Røysamb et al. (1997) expanded the seven risk-related factors with five health-related behaviors: cigarettes smoking, alcohol consumption, exercise, diet, and dental hygiene. They analyzed the 12 factors by a second-order exploratory PCA. Three underlying factors: Addiction, High action, and Protection resulted from the factor-loadings. In step four using confirmatory factor analysis (CFA) on the second sample, Røysamb et al. compared the three-factor model with a one-factor model, two-factor model, and the PCA suggested four-factor model. The three-factor model was the best-fit model among the models on all the model fit measures.

In the fifth step, again on the first sample, Røysamb et al. analyzed the three-factors by a third-order exploratory PCA. This statistical analysis resulted in a bipolar third-order factor, which encompassed a pole of Health-Threatening behavior and a pole of Health-Enhancing behavior. The last step included examining the fit of the model's three levels simultaneously on the second sample. Following the modification indices, Røysamb et al. allowed the physical activity variable to load on both the High Action and Protection factors. This modification produced acceptable fit of the adjusted model on the five measures of fit. In the three PCA's analyses, each level explained a significant proportion of the health-related behavior variation.

Røysamb et al. (1997) argued that each level of the multidimensional model supports a different health-related behavior structure. For instance, the third level supports a one-factor structure, as in the problem behavior theory, and the first level supports the multifactor structure. The various views of health-related behaviors' dimensionality (i.e., one-dimension, bidimensionality, and multidimensionality) apply and have complementary and mutual roles in the model (Røysamb et al., 1997). The levels of the hierarchical aggregation of behaviors in the multidimensional model structure may allow better understanding of the adolescent tendency to engaging in risk behavior. For instance, swimming while intoxicated illustrates an overall health-threatening predisposing or risky lifestyle at the third level. At the same time, this behavior reflects addiction tendency of the adolescent at the second level and engagement in particular risk behavior at the first level. The multidimensional model explained a significant proportion of the health-related behavior variance, 64.7%, 50.0%, and 53.0% in the first, second, and third level respectively. Nevertheless, Røysamb et al. noted unexplained latent errors in the second-order factors.

Røysamb et al.'s (1997) selection of health-related variables according to their probability in causing or preventing injury is questionable. In particular, Røysamb et al. overlooked significant health-related risk and protective factors: sexual activity, drug use, delinquency, aggressive and violent behaviors, religiosity, and school attainment (de Looz et al., 2011; Feldstein & Miller, 2006; Jessor & Jessor, 1977; Salas-Wright et al., 2014; Willoughby et al., 2004). It is more likely that the second-level factors are limited to the concentration of variables on specific risk and protection variables. One might assume that adding variables of drug use, delinquency, and aggression to this model will produce additional or different factors. A good example to note is Willoughby et al.'s (2004) three-factor model. In this model, the factor loading of a spectrum of risk behaviors resulted in three separate, but moderately interrelated factors: Problem Behavior (e.g., drug use, alcohol, and sexual activity), Delinquency, and Aggression. Moreover, *using toothpicks*, which was one of the dental hygiene variables, is, in fact, an unhealthy behavior that may damage the periodontal tissue (University of Maryland Medical System [UMMS], 2014). These limitations render the variables far from being sufficient for explaining the health-related behavior variation in the model.

Therefore, my use of Røysamb et al.'s (1997) multidimensional model was not restricted to the model's list of variables or categories. This noncompliance had two aspects. First, Røysamb et al. focused on health-related behaviors. My focus was on youth assault-injury, which has particular risk and protective factors differing to a considerable degree from Røysamb et al.'s variables (Buckley et al., 2012; Cheng et al., 2006; Cunningham et al., 2011). Second, although the PBT's problem behavior system supported Røysamb et al. study, Røysamb et al. overlooked critical risk and protective behaviors, which along with many of Røysamb et al.' variables compose the problem behavior system constructs. These missing variables included religiosity, school performance, use of various illicit drug, risky sexual activity, and delinquent behaviors. A review of relevant research to discuss the researchers' use of PBT and the dimensionality while examining youth assault-injury was necessary to support my choice of the theoretical foundation.

The Researchers' Use of Problem Behavior Theory and the Dimensionality for Explaining Youth Assault-Injury in the Literature

Youth assault-injury researchers who used the PBT's lens tended toward predicting the injury occurrence or examining its outcomes. In such studies, researchers frequently used the problem behavior system of the PBT. They consistently examined a limited number of risk and protective factors compared with the Jessor's (1987) suggested variables in the theory. Apparent in such studies is the lack of consensus on the variables selectivity. For instance, de Looze et al. (2011) examined the relationship between early onset of risk behaviors and adolescent injury in 25 countries using the PBT lens. de Looze et al. used a broad injury measure, which included any injury that required medical attention during the last 12 months and then dichotomized the responses to *no-injury* and *at least injured once.* de Looze et al. noted their focus on risk behaviors in early adolescence versus the PBT general focus on risk behaviors in adolescence. de Looze et al. argued that the youth late engagement in problem behavior might be a temporary phenomenon related to the adolescents' development process. However, when most young adolescents are not interested in problem behaviors, the early onset of such behaviors predicts a future risky and unhealthy lifestyle (de Looze et al., 2011). Because the health behavior in school-aged children (HBSC) survey did not include the age of at least one of the problem behavior onsets, de Looze et al. excluded seven countries including the United States from the study. Drunkenness, cigarettes smoking, cannabis use, and early intercourse were the risk factors for injury occurrence at age 15. Physical exercise, gender, and SES were the confounding variables in deLooze et al.'s study. Comparable to the PBT's assumption of risk behavior co-occurrence, de Looze et al. reported consistent and cumulative associations between the number of early engagements in risk behaviors and adolescents' injury cross-countries. The issue, which calls for discussion, is de Looze et al.'s elimination of the behavior system's protective factors and delinquent behaviors including aggressive behavior from their study. Because of this elimination, de Looze et al. overlooked the potential roles of the protective factors and delinquent behaviors and the interactions between risk and protective factors in influencing the injury outcome. The researchers' use of a limited number of risk factors and their overlooking of protective factors are frequent in youth assault-injury studies.

For instance, Walsh et al. (2013) used the PBT lens and examined medically treated injury (i.e., intentional or unintentional) as an outcome of weapon carrying and physical fighting in five countries including the United States. Walsh et al. reported statistically significant associations between physical fighting and weapon carrying and the medically treated injury occurrence. These results were consistent across countries. Walsh et al.' use of two risk behaviors and then their combination of intentional and unintentional injury in a single variable illustrate inconclusiveness and an oversimplified view of assault-injury. The inclusive lists of problem behaviors exist in studies in which researchers examined the adolescents' PBS, but not assault-injury.

Research in which authors encompassed a comprehensive list of problem behaviors and focused on examining the dimensionality of the PBS is rare: however, it does exist. A good example of such research is the Sullivan et al. (2010) study. Within the framework of PBT, Sullivan et al. distinguished four problem behavior-related groups in the latent class analysis results. In addition to the differences in characteristics and level of engagement in risk behavior per group, Sullivan et al. reported correlations between risk factors within each group. Among the four groups, the higher degrees of school victimization, which included bullying and assault, and physical and sexual assault victimization indicated greater degrees of risk behaviors (Sullivan et al., 2010). Although the focus of Sullivan et al.'s study was not youth assault-injury, two significant aspects are relevant to the present study. First is the comprehensive list of problem behaviors and their existence and interrelations according to the group level of engagement in problem behavior. Second is that the degree of physical assault victimization positively correlated with the degree and breadth of the adolescents' engagement in *generalized* problem behavior.

In Sullivan et al.'s (2010) study, the dimensionality usage resulted in grouping adolescents according to their level of engagement in problem behavior not in categories of problem behavior. This dimensionality is still relevant since Sullivan et al. reported patterns of behaviors, which reflected categories of behaviors, among each group. For instance, physical assault associated with *generalized* problem behavior. Sullivan et al. measured physical assault in two instances: relational physical assault and assaults at school, which included physical assault and bullying victimization. This measure is relevant because of the evident overlap between victimization and perpetration, the similarity of risk factors between the physically violent and the physically and relationally violent groups, and the associations between the physical and relational victimization and injury (Dukes et al., 2010; Herrenkohl et al., 2007; Jennings, Piquero, & Reingle, 2012; Jennings, Higgins, Tewksbury, Gover, & Piquero, 2010; Schreck, Stewart, & Osgood, 2008). Sullivan et al.'s and other researchers' results supported the dimensionality of the PBS (Childs, 2014; Chun & Mobley, 2010).

In summary, it appears that the PBT is appropriate for examining youth assault-injury in view of the PBS. Supporting this applicability is the researchers' frequent use of PBT in research to examine the problem behavior dimensionality. The dimensionality expands the understanding of the co-occurring risk and protective factors' differential patterning. In the PBT, Jessor's (1987) assumption of one-dimension PBS, even though established in the literature, explained a small percentage of problem behavior variation compared to multidimensional models. Researchers who studied the PBS's dimensionality provided various models according to the list of variables and the approach and focus that buttressed their generation of models. Although Røysamb et al.'s (1997) multidimensional model is not devoid of limitations; this model suggests better explanation of the health-related behavior compared to a one-dimension model. In assault-injury research with a PBT's lens, authors frequently used a limited number of assault-injury risk factors (de Looze et al., 2011; Walsh et al., 2013). Absent in the literature I reviewed are studies in which authors examined youth assault-injury etiology and/or dimensionality by using an inclusive list of risk and protective factors. Thus, my use of PBT and the multidimensional model and an inclusive list of risk and protective behaviors might have overcome this gap in youth assault-injury literature. In the literature I reviewed, youth assault-injury existed in two main interrelated themes: youth violence and youth injury. Many concepts in youth violence and youth assault-injury relate to my research and call for discussion.

Assault-Injury-Related Concepts in Youth Violence Research

In the research on youth violence, I found five salient concepts relating to the focus of my study. The first concept is that researchers often included youth assault-injury in the violence variables for almost all physical violence forms including perpetration, victimization, and witnessing (Henry et al., 2012; Herrenkohl et al., 2007; Reingle et al., 2013; Stoddard et al., 2013). The second concept is the authors' noticeable use of aggressive behaviors (e.g., physical fighting, weapon carrying, and weapon threat to others), which are assault-injury's predictors, to assess violence (either victimization or perpetration; Buckley et al., 2012; Cunningham et al., 2011; Walsh et al., 2013). These aggressive behaviors variables repeatedly lacked intensity and motivation specifications (Dahlberg, Toal, Swahn, & Behrens, 2005; Henry et al., 2012; Herrenkohl et al., 2007; Reingle et al., 2013; Stoddard et al., 2013). The third concept is the researchers' frequent distinction between profiles of victims and profiles of perpetrators and their focus on only one profile (Foshee et al., 2011; Lin et al., 2011; Steiner et al., 2014). In such studies, the researchers overlooked the evident overlap between victimization and perpetration and the similarity in their risk factors (Jennings et al., 2012; Jennings et al., 2010; Schreck et al., 2008; Logan-Greene et al., 2010).

The fourth concept is the authors' repeated use of *intention* or similar expressions (e.g., *with the idea* of hurting others) in violence assessment measures (Dahlberg et al., 2005). Two issues render the use of the *intention* of the youth to measure physical-violence highly questionable. The first such issue is the incomplete development of the adolescents' cognitive system, which gives rise to immature judgment and ability, to differentiate *intentional* from *unintentional* acts. The adolescents' *idea* and *their intention* of inflicting harm on others are, in fact, neither precise nor measurable (Rosset & Rottman, 2014). The second issue is the continuing controversy in regard to the bias of the explanations and inferences of the term *intentional* (Burns, Caruso, & Bartels, 2012; Hughes, Sandry, & Trafimow, 2012; Rosset, 2008). Unfortunately, researchers have frequently used items that included such mental states as though they are reliable and measurable in physical-violence assessments (Henry et al., 2012; Reingle et al., 2013; Stoddard et al., 2013).

The fifth concept is the researchers' frequent inclusion of items, such as engagement in a physical fight, in a serious fight, and in a group fight, either combined or not, in the violence measures (Bernat et al., 2012; Dahlberg et al., 2005; Loh et al., 2010; Moon, Patton, & Rao, 2010; Salas-Wright et al., 2012). In the literature I reviewed, except for the violence measurements' reliability scores, scientific typology of physical fights seriousness levels and explanations of the violence-related differences between engagement in a physical fight, in a serious fight, and in a group fight were absent. In research on youth violence, researchers' selectivity of such items to measure violence seemed arbitrary. With the lack of scientific typology, it might be logical to consider the occurrence of fight-related injury an appropriate measure for engagement in a serious fight. This logical consideration supports my selection of youth assault-injury as an outcome variable, which reflects adolescents' actual involvement in violence.

An illustration of the researchers' use of assault-injury, its predictors, and immeasurable state of mind in the violence assessment measures is Herrenkohl et al.'s (2007) research. Herrenkohl et al. examined whether physically violent youths, relationally aggressive (i.e., nonphysically violent) youth, violent and aggressive youths, and nonoffenders share similar risk factors on all socioecological levels. Herrenkohl et al. measured physical violence by three items: perpetrating assault-injury, threatening others with a weapon, and attacking others with the idea of seriously hurting them. Herrenkohl et al. reported overall consistent differences in risk factors between the *relationally aggressive* and the *physically violent* groups. They noted similarity between the *physically violent* group and the *violent and aggressive* group. Although Herrenkohl et al. stated the limitation of excluding the protective factors from the study variables; they failed to report the potential impact of dichotomizing physical violence into two categories. These categories were *zero* for adolescents who responded negatively to all the questions and *one* for adolescents who responded positively to any of the items. Herrenkohl et al.'s assumption of similarity between youths who caused physical harm to others and youths who positively responded to the question of the *idea to harm*, which is immeasurable and lacked intensity, frequency, motivation, and outcome specifications (e.g., one-time self-defense) might be misleading. Herrenkohl et al.'s focus on violence perpetration and their exclusion of victimization from the study are frequent in violence research.

Taking into account the evident overlap between violence perpetration and victimization, the authors' focus on one type and elimination of the other might also be misleading particularly when they aim to distinguish different violent groups (Jennings et al., 2012; Jennings et al., 2010; Schreck et al., 2008). Nurius, Russell, Herting, Hooven, and Thompson (2009) examined the differences in the violence risk and protective factors among four groups of youths at high risk of dropping out of school. Nurius et al. hypothesized that exposure to violence exists in a structure of multiple risk factors and that greater exposure to violence predicts elevated and numerous problems. Accordingly, Nurius et al. categorized the adolescents into *no-exposure*, *single-exposure*, and *multiple violence exposure* groups. Nurius et al. utilized five items in the assessment measures of exposures to violence. Two items related to witnessing family violence and three to experiencing physical abuse, sexual abuse, and /or assault-injury. Nurius et al. confirmed the importance of considering the rate of exposure to violence; they found statistically significant differences between the *no-exposure, single-exposure*, and *multiple types of violence exposure* in all risk factors. They reported similar, but less prominent tendencies for protective variables. Nurius et al. noted that the *multiple violence exposure* group was higher in risk factors and lower in protective factors compared to the other violent groups. Nurius et al. focused on victimization and disregarded the potential effects of perpetration on groups' characteristics and the frequency of exposure to violence (Jennings et al., 2012; Jennings et al., 2010; Schreck et al., 2008). For instance, the single-exposure group might have included adolescents who were frequent violence perpetrators. Accordingly, including youth assault-injury perpetration and victimization in my study overcame the potential effects of the overlap between these two types on the study results.

The influence of researchers' use of various fight-related items, with the lack of scientific typology, specifications, and explanations of the differences between these items, on research results remains unspecified. For instance, Salas-Wright et al. (2012) examined the associations between different levels of religious involvement and substance use, violence, and delinquency among 17,705 adolescents. Salas-Wright et al. included three violence-related variables: the adolescents' self-report of past year involvement in fights, in group fights, and in violent attacks. They generated five distinct religious involvement classes: disengagement, infrequent, private religion, regular, and devoted groups. Salas-Wright et al. reported statistically significant associations of the membership in the religiously devoted group and the religiously regular group with a decrease in past year involvement in fights compared with disengaged group. Salas-Wright et al. observed no associations of the membership in any of the religious involvement classes with past year group fight and violent attack. The statistically significant associations of the membership in the religiously devoted group and the religiously regular group with a decrease in past year involvement in fights, which is a violence measurement, but not with decrease in the other two fight-related variables, which are also violence measurements, is unjustifiable. It remains unclear how fighting, group fighting, and violent attack are different: they share being, in fact, violent attacks.

In conclusion, the absence of researchers' consensus on the violence assessment items, which consistently lacked intensity, outcomes, and motivation specifications, and the authors' dependence on the adolescents' report of their *intention* to harm others in the violence assessments items are prominent aspects in many of the youth violence studies. Furthermore, the authors' categorization and assessments of violent groups' characteristics and risk and protective factors differ significantly; scientific typology of the different violent youth groups is also absent. These gaps provide justification for the need for my study, which might enhance the knowledge of the risk and protective behaviors of youth assault-injury (as an actual act of violence) for both perpetrators and victims. In order to complete the picture of the authors' approaches to studying youth assault-injury in the literature, examining concepts related to my focus in research on adolescents' injury appears to be necessary.

Assault-Injury-Related Concepts in Youth Injury Research

In the literature I reviewed, with the exception of the prevention research, authors focused less frequently on youth assault-injury compared to the wealth of youth violence studies, wherein researchers embedded assault-injury in the violence assessments. Often, in research on adolescents' injury, authors combined intentional and unintentional injury in the same variable, while inaccurately assuming similarity in the risk and protective factors of both types (de Looze et al., 2011; Linakis et al., 2009; Walsh et al, 2013). In some cases, when researchers distinguished intentional from unintentional injury, they combined suicide with homicide in the same category (Mattila et al., 2008). Studies wherein authors examined a limited number of the adolescents injury risk and protective factors either locally or across countries are frequent. In all such studies, researchers combined intentional and unintentional injury in a single variable (de Looze et al., 2011; Pickett et al., 2009; Pickett et al., 2005; Ranney et al., 2009; Walsh et al., 2013). Research conducted in which authors focused on assault-injury etiology and/or dimensionality are absent in youth assault-injury literature. My focus on youth interpersonal violence-related/assault-injury, as distinct from self-inflicted, inmate violence-related, sexual assault, and unintentional/accidental injury, and my inclusion of an inclusive list of risk and protective factors might have overcome the gaps in the literature. These gaps are researchers' combination of various types of injury in a single variable, their use of a limited number of risk and protective factors, and their failure to examine youth assault-injury etiology.

Even with the evident differences between youth intentional and unintentional injury risk factors, the researchers' frequently combined both injury types in a single variable (de Looze et al., 2011; Linakis et al., 2009; Pickett et al., 2005; Walsh et al., 2013). Exemplars of this combination are the cross-countries studies of de Looze et al. (2011) and Walsh el al. (2013). de Looze et al.'s (2011) injury assessments included a single question about any medically attended injury during the last 12 months. In this question, de Looze et al. asked respondents to report all unintentional/accidental and violence-related injuries. de Looze et al. dichotomized the responses to *no-injury* and *at least injured once* in the last 12 months. Walsh et al. (2013) measured injury using the same question. These studies provided a global description for the distributions of adolescents' injuries and some of the risk and protective factors. However, in youth violence research, authors illustrated consistent differences in the risk factors between nonviolent and violent groups (Foshee et al., 2011; Herrenkohl et al., 2007; Logan-Greene et al., 2010; Nurius et al., 2009). In youth assault-injury research, authors demonstrated differences between the predictors of youth intentional and unintentional injury (Carter et al., 2013; Cunningham et al., 2011; Dukes et al., 2010). Therefore, the researchers' grouping of intentional and unintentional injuries in one profile and their assumption of shared risk factors is unjustifiable and might be misleading (Cherpitel, 2007; Linakis et al., 2009). This combination of intentional and unintentional injuries is frequent in adolescent injury literature (Buckley et al., 2012; Pickett et al., 2005). Other authors distinguished these two types of injury, but failed to distinguish suicide from homicide.

The authors' distinction between intentional and unintentional injury are even more misleading when they combine homicides and suicides in one category. For instance, to examine if adolescents' health and health-related behaviors predicted injury-death in adulthood, Mattila et al. (2008) followed 57,407 Finnish 14 to 18-year-olds for 652,530 person-years. Mattila et al. also compared the risk factors of intentional (i.e., homicide and suicide) and unintentional (i.e., poisoning, drowning, water and road traffic accident, and fall) injury-deaths. Mattila et al. linked the cohort baseline data with the official cause-of-death statistics, and then reported statistically significant higher injury deaths among male than female. For intentional injury-deaths, Mattila et al. noted that suicides were the leading cause of death among both men (96.7%) and women (92.3%). Mattila et al. reported that both recurring drunkenness and daily smoking were significant predictors for intentional and unintentional injury-deaths. Mattila et al. also noted that perception of poor health and the number of weekly stress symptoms were associated with intentional injury-deaths, while there were no associations between any of the health-related variables and intentional and unintentional injury-deaths. Mattila et al. concluded that intentional and unintentional injury-deaths have similar health and health behavior risk factors. This conclusion is unwarranted, since Mattila et al. failed to take into account the small proportions of homicides among intentional injury-deaths: 3.3% among men and 7.7% among women. Moreover, Mattila et al. overlooked the differences between the homicide and suicide risk and protective factors.

In suicide literature, the suicide risk factors, with few exceptions, differ from the homicide risk factors (Jones-Webb & Wall, 2008; Loeber & Farrington, 2011). According to Nock et al.'s (2008) systematic review of suicide epidemiology studies between 1997 and 2007, the male gender, family suicide history, homosexuality, chronic and terminal illnesses, and psychiatric, psychological, and biologic factors were the suicide risk factors across countries. Nock et al. also noted that stressful life events interacted with risk factors and increased the risk of suicide. Nock et al. delineated suicide protective factors, which included religiosity, spirituality, social support, being pregnant, and having young children. Van Dulmen et al. (2013) reported mutual associations between violence and suicidality, which were stronger among males and younger adults, and found that violence predicts future suicide. Accordingly, Mattila et al.'s (2008) assumption of similarity in characteristics and risk and protective factors between the self-harmful, the suicidal, and the aggressive adolescents is unjustifiable. This misleading assumption might relate to the lack of studies in which researchers differentiated and comprehensively examined youth assault-injury and its risk and protective factors. My study enhanced the understanding of the interpersonal intentional/violence-related injury risk and protective factors since I used an inclusive list of behaviors. This inclusiveness was missing in prior relevant research.

When authors differentiated intentional from unintentional injuries, they examined only a limited number of risk factors and repeatedly overlooked protective factors. Cunningham et al. (2011) conducted a cross-sectional study on adolescents presenting to the emergency department (ED) at Hurley Medical Center, Flint, Michigan for any medical reason. They examined the prevalence of injury in the past year and associated factors among 1,128 respondents. In the in the self-report questionnaire, Cunningham et al. differentiated intentional injury, which included weapon-related and physical fight-related injury, and injury from being physically attacked, from unintentional injury, which resulted from sports, falls, car accidents, and/or starboard and bike accidents. Cunningham et al. noted that out of 293 respondents who reported intentional injuries, 186 were physical fight-related (26.3% of which received medical attention), 105 were injuries from physical attack (40.0% of which received medical attention), and 93 were gun-related injuries (18.3% of which received medical attention). Cunningham et al. examined the relationships among gender, age, race, binge drinking, marijuana use, cigarette smoking, weapon carrying, and the receipt of public assistance and youth intentional compared to unintentional injury. Cunningham et al. noted the study limitations, which included the cross-sectional design and the survey daily timing (between 1:00 and 11:00 PM). Although Cunningham et al. included an array of the assault-injury risk factors; they eliminated the protective factors and other risk factors (e.g., history of violence; Dukes et al., 2010; Ranney et al., 2011; Wiebe et al., 2011). Of particular importance in Cunningham et al.'s (2011) study are the high percentages of assault-injury that did not receive medical attention, which reflect an incomplete picture of assault-injury prevalence among adolescents, particularly the physical fight- and the gun-related injury.

In summary, youth-assault injury, despite its significance, remains confounded in the extant research. The limitations in prior studies include the researchers' combination of intentional and unintentional injuries (de Looze et al., 2011; Pickett et al., 2005; Walsh et al., 2013) and suicides and homicides (Mattila et al., 2008). Other limitations are the authors' use of a limited number of risk and protective factors or their elimination of protective factors and confounders in the statistical tests (Cunningham et al., 2011; Dukes et al., 2010). The above review, which highlighted many gaps in the literature, necessitated prudent selection and additional investigation of relevant research to demonstrate the youth assault-injury key variables in the literature.

Literature Review of Key Variables

In Røysamb et al.'s (1997) multidimensional model, first-order relevant variables produced the second-order factors/categories, which were High action, Addiction, and Protection. These categories resulted in Health-Enhancing and Health-Threatening classes in the third level. In the third-order level, risk sports and action, physical training, car speeding, and motorcycle risk formed the High Action category at the second-order level. Alcohol consumption, smoking, risk behavior while intoxicated, and car driving while intoxicated composed the Addiction category in this model; behaviors in the Protective category were proper diet, dental hygiene, using safety equipment, and wearing seat belts.

Of particular concern in the use of Røysamb et al.'s model in the present study is the variables' applicability to youth assault-injury. Røysamb et al. focused on Norwegian youths' health-related behaviors, and my focus is on American youth assault-injury. My focus necessitates taking into account the American youth assault-injury risk (e.g., weapon carrying) and protective factors. These factors differ to some extent from Røysamb et al.'s variables (Cunningham et al., 2011; Dukes et al., 2010). Although Røysamb et al. (1997) based their multidimensional model on the behavior system of Jessor's (1987) PBT, they excluded drug use, delinquency (norm-violating and aggressive behaviors), and risky sexual behavior. In relevant studies, researchers illustrated co-occurrence of these behaviors with adolescents' aggression (Childs, 2014; Hair et al., 2009; Reingle et al., 2012; Sullivan et al., 2010; Willoughby et al., 2004).

Røysamb et al. (1997) also excluded the behavior system's conventional behaviors: school performance and church attendance. Jessor (1987) assumed that these two behaviors reflect the adolescents' accordance with social norms. In relevant studies, researchers illustrated protective effects of average grade level and religiosity on the likelihood of youth violence (Baier, 2014; Bernat et al., 2012; Salas-Wright et al., 2014). Røysamb et al.'s (1997) variables did not include all the American youth assault-injury risk and protective factors. Therefore, my selection of variables included the variables constructing the PBT's behavior system (drug use, risky sexual intercourse, delinquent and aggressive behaviors, school performance, and religiosity; Jessor, 1987).

Since my focus was on youth assault-injury risk and protective behaviors not on assault-injured youth characteristics, and researchers illustrated influence of demographic characteristics on assault-injury occurrence likelihood, I included a discussion of the youth assault-injury covariates: age, sex, race and ethnicity, and SES (Baxendale, Cross, & Johnston, 2012; Cunningham et al., 2010; Melzer-Lange, Van Thatcher, Liu, & Zhu, 2007; Ranney et al., 2009; Simpson et al., 2005). My discussion of these variables illustrated the rationale for controlling for these variables in the statistical analyses.

Explaining each of the youth assault-injury key variables was essential to illustrate the available knowledge, the controversies, and the gaps that necessitated further research. Because of the assault-injury studies' limitations and scarcity, I have included studies on youth violence and PBS in the discussion of variables. What follows is a comprehensive demonstration of Røysamb et al.'s (1997), Jessor's (1987) variables, and covariates as they correlate with youth assault-injury in the literature.

Youth Assault-Injury

Authors' methods to produce youth assault-injury variables have varied significantly, and each of these approaches has its limitations. For instance, authors frequently used the ED records, which included classifications for intentionality, injuries, and causes (Cunningham et al., 2011; Ranney et al., 2011). In the ED records, in addition to the missing information, the intentionality is repeatedly miscoded (Ranney & Mello, 2011). In such studies, researchers overlooked untreated injuries. Other authors utilized the self-report of being hurt, or hurting others, with or without a weapon, for operationalizing the injury variables (Pickett et al., 2005; Walsh et at., 2013). In such studies, authors often overlooked the motivations, intensity, frequency, and outcomes of the aggressive behaviors or examined only a limited number of the assault-injury predictors (Dahlberg et al., 2005; Henry et al., 2012; Herrenkohl et al., 2007; Swahn, Simon, Hammig, & Guerrero, 2004). Youth assault-injury might be an outcome or a predictor of violence, aggression, and various risk factors and behaviors. The authors' use of a variable of assault-injury exclusively is rare in relevant studies. Such studies usually suffer from various limitations, such as the lack of randomization, oversampling of particular minority or sex groups, small sample size, and the inclusion of a limited number of risk factors (Cheng et al., 2006; Cunningham et al., 2011; Murphy et al., 2010).

Oversampling minority and particular sex groups and the lack of randomization are frequent limitations in studies of youth assault-injury. Cheng et al. (2006) examined the situations and mechanisms that led to assault-injury among a convenience sample of

143 adolescents presenting to two EDs with interpersonal assault-injury in urban areas. Cheng et al. noted the oversampling of African Americans (93%) and males (71%). Cheng et al. produced the assault-injury variable from all injuries from firearms, blunt objects, and stabbing and fighting with unarmed persons. Cheng et al. observed statistically significant higher weapon-related injuries and previous fights among males, compared to females, and a greater likelihood of reporting last year's injuries (intentional and unintentional) among weapon-injured respondents. Cheng et al. also noted that almost half the respondents reported two or more fights in the past 12 months and that 45% of the assault-injured youths had a history of violence perpetration. The limitations in the Cheng et al.' study and those of many other studies render these studies inappropriate for establishing comprehensive understanding of youth assault-injury and its determinants. Unfortunately, these limitations are not the only gaps in the literature that prevent such understanding.

In examining a limited number of predictors, authors might distinguish assault-injury variables but overlook the untreated injuries. Swahn et al. (2004) categorized assault-injury in two classes: past year rate of recurrence of fight-related medically treated injuries and frequency of causing medically treated-injury to others. From the national longitudinal study of adolescent health data (Add Health), Swahn et al. selected a sample of 8,885 adolescents who had at least one drink in the past year. Swahn et al. examined the correlations between various patterns of alcohol use and assault-injury and violence. They reported greater likelihood of fighting, assault-injury, and injuring others among respondents who reported binge drinking, problem drinking, peer drinking, and recurrent drinking, compared with these who did not report these behaviors. Since high percentages of assault-injured youths do not get medical attention, the exclusion of injury that did not require medical attention from Swahn et al.'s assault-injury assessment measures might have influenced their research results (Cunningham et al., 2011). Taking into account the confounders, the other risk factors, and the protective factors effects on the adolescents' assault-injury, the influence of Swahn et al.'s elimination of these variables on the study results also remains unclear (Dukes et al., 2010; Herrenkohl et al., 2012; Vazsonyi et al., 2010). It might be difficult to depict a comprehensive picture of youth assault-injury from relevant research. Research wherein researchers examined the problem behavior syndrome comprehensively might be useful to complete this picture.

Research in which authors focused on the co-occurrence of problem behaviors might illustrate the assault-injury relationships with other risk variables among different violent and non-violent adolescent's groups (Childs, 2014). Consistently, in these studies, researchers combined assault-injury with other aggressive behaviors in the violence variables. In such studies, the authors used factor models, which resulted in grouping the adolescents according to their level of involvement in problem behaviors (Hair et al., 2009; Reingle et al., 2012). The adolescents who reported little or no involvement in any problem behavior constituted a group of non-involvement individuals. Youths with infrequent involvements in a limited number of risk behaviors constituted a group of moderate risk-involvement individuals. Numerous involvements in various risk behaviors were the characteristics of the high-risk involvement group members (Sullivan et al., 2010; Willoughby et al., 2004). The percentages of these groups varied between studies, and the majority of adolescents were in the moderate involvement groups. In these studies, violence persistently related with multiple risk behaviors among the moderate and high-risk involvement groups (Childs, 2014; Hair et al., 2009; Reingle et al., 2012; Sullivan et al., 2010; Willoughby et al., 2004). In such studies, researchers illustrated associations between physical assault and aggressive behaviors and involvements in various problem behaviors.

For instance, Willoughby et al. (2004) examined the dimensionality of the PBS on a sample of 7,430 adolescents in Ontario, Canada. In addition to interpersonal and contextual predictors, Willoughby et al. identified ten problem behaviors to examine their co-occurrence in adolescence. These problem behaviors included alcohol, marijuana, and drug use, smoking, gambling, risky sexual behavior, and delinquent and aggressive behaviors. Based on the adolescents' level of involvement in the problem behavior, Willoughby et al. identified three levels for each risk variable: no-involvement, at risk with some involvement, and high-risk, which indicated consistent involvement in the behavior. Willoughby et al. included gang membership and carried a knife and/or a gun in the major delinquency measure, and they formed the direct aggression variable using items of physical attacks (e.g., kicking, hitting, shoving) and bullying (e.g., calling names). Willoughby et al. reported statistically significant associations between pairs of problem behaviors for each level of involvement.

Among individuals with any involvement in problem behaviors, Willoughby et al. (2004) noted statistically significant associations between the involvement in direct aggression and the involvement in all other problem behaviors compared with no-involvement in direct aggression. Willoughby et al. also noted that the involvement in direct aggression associated with risk ratios, which varied from 1.67 for smoking to 3.48 for delinquency and 4.28 for indirect aggression compared with no direct aggression. Willoughby et al. stated that at higher values of relative risks, which existed among high-risk involvement, the co-occurrence of problem behaviors became limited. Taking into account the associations between fighting and injury and the associations between aggression and injury, the involvement in the direct aggression behaviors was more likely to have had resulted in assault-injury (Ducks et al., 2010; Rudatsikira, Muula, & Siziya, 2008; Snider & Lee, 2007). Consequently, to some extent, Willoughby et al.'s study results illustrated patterns of associations between assault-injury and all other problem behaviors.

In brief, youth assault-injury is one of the multiple problem behaviors, which mutually exist and correlate. Researchers' assessments of assault-injury, separate from other violent behaviors, do occur in research. Many of these studies contained methodological limitations and in many such studies authors excluded the high percentages of the non-treated assault-injuries (Cunningham et al., 2011; Swahn et al., 2004). Associations between aggression and a list of problem behaviors, which align with Jessor's (1987) PBT, exist in research in which researchers embedded youth assault-injury in the aggression variables. These researchers' studies results do not provide evidence for such associations. Because of the limitations of youth assault-injury research, the absence of studies on youth assault-injury etiology, and the significant associations between adolescents' aggressive behavior and all other problem behaviors, my study may well be the first to examine an inclusive list of youth assault-injury's risk and protective behaviors on a nationally representative sample. My study dependent variable: youth assault-injury included self-reported perpetration and/or victimization of medically treated and non-treated injuries that resulted from violent encounter including involvement in a weapon use, physical fight, and/or physically attacking others and being physically attacked. The following is a discussion of independent variables related to youth assault-injury based-on PBT and the multidimensional model.

The High Action Variables and Youth Assault-Injury

Risk sports and action, physical training, car speeding, and motorcycle risk formed the High-Action category in Røysamb et al.'s (1997) multidimensional model. Røysamb et al. included variables such as parachuting, hang gliding and Alpine sports as risk sports variables. They also included driving a motorcycle on an icy road and diving into the water from a height of 5 meters as risk action variables. In the literature I reviewed, theory and research on the relationships of Røysamb et al.'s risk sports and action variables and youth-assault-injury are absent. The lack of supportive theory and research necessitate the exclusion of Røysamb et al.'s risky sports and action from my study.

Only Buckley et al. (2012) integrated car speeding in one risky driving variable, and then illustrated significant association between risky driving and Australian adolescents' injury. Among the studies I reviewed, no other researchers incorporated car speeding as youth assault-injury risk factors. In research on risky driving including car speeding, authors found statistically significant correlations between Australian young adults' aggression and an increase in car speeding likelihood (Begg & Langley, 2004; Vassallo et al., 2007). These authors suggested that car speeding is more likely to be the outcome of, but not a risk factor for young adults' aggressive behaviors. Accordingly, from the variables in Røysamb et al.'s High Action category, car speeding and physical training (weekly physical exercise) are the variables that relate to youth-assault-injury and thus to my study.

Røysamb et al.'s excluded the weapon carrying, delinquency, violence, and risky sexual behaviors variables from their study. These variables are critical components of Jessor's (1987) problem behavior system and might reflect the adolescents' involvement in high action behaviors. The correlations between weapon carrying and history of violence with youth-assault injury are well established in the literature (Cheng et al., 2006; Cunningham et al., 2011; Dukes et al., 2010; Ranney et al., 2011; Thurnherr et al., 2009; Wiebe et al., 2011). Conversely, researchers seldom examined the relationship between delinquency and youth assault-injury (Morash & Stevens, 2010). In such research, the methodological weaknesses render the researchers' results doubtful. In studies on youth violence, researchers reported inconsistent association between delinquency and youth violence (Henry et al., 2010; López & Emler, 2011). In the literature I reviewed, there were no studies in which researchers examined the relationship between risky sexual activity and youth assault-injury. In research on PBS, authors illustrated significant correlations between the adolescents' risky sexual activity and the membership in multiple problem behaviors groups (Childs, 2014; Sullivan et al., 2010). The gaps in the literature about the relationships between delinquency and risky sexual behaviors variables and youth assault-injury and the correlations between violence and weapon carrying and youth assault-injury support my inclusion of these variables in my research. This inclusion might overcome the gaps and enhance the understanding of the youth assault-injury's underlying structure among these and other risk and protective variables.

Car speeding and youth assault-injury. In the literature I reviewed, there was only one study in which researchers examined the relationship between car speeding and youth injury. In this study, Buckley et al. (2012) used a sample of 540 Australians 13- to 14- year-olds to examine the associations between anti-social behaviors and both medically treated and untreated injury. Buckley et al. measured risky driving by a combination of items of driving without a license, speeding, driving while intoxicated, and joyride. They assessed injury by self-reported medically treated and non-treated types of injuries (e.g., broken bones, sprain) in the past three months. Buckley et al. reported a statistically significant correlation between risky driving and injury, and a statistically significant correlation between passenger risk (riding with a dangerous driver or a drunk driver) and injury. Buckley et al.'s combination of various risk driving behaviors in a single variable and intentional and unintentional injury in another single variable render their research results insufficient to establish a correlation between car speeding and youth assault-injury.

Since driving is a part of American adolescents' culture, it seems logical that this is an important risk variable. Because of the lack of research on the relationship between car speeding and American youth assault-injury I decided to include this variable in my study. The Add Health dataset did not include any variables related to car speeding, but included variables of risky driving (driving while intoxicated and wearing a seat belt). Accordingly, I selected the risky driving variables and discussed their inclusion in my study in later sections.

Physical training (weekly physical exercise) and youth assault-injury. In the research I reviewed, physical training appeared only in studies on youth violence, but not in studies in which researchers focused on youth-assault injury. Researchers illustrated contradictory results with regard to the relationship between physical activity and youth violence (Childs, 2014; Sullivan et al., 2010; Swahn & Donovan, 2004, 2006). Researchers found that all levels of weekly physical exercise were not significant predictors of membership in any violent and nonviolent group compared with exercise five times and more a week controlling for age (Childs, 2014). Other authors found that groups of high involvement in diverse problem behaviors have significant lower values of past month regular exercise compared with nonviolent group (Sullivan et al., 2010). Other researchers noted that frequent physical exercise was a statistically significant risk factor for female violence in cross-sectional studies compared to male violence, but did not predict future violence for either males or females (Swahn & Donovan, 2004). Moreover, researchers found statistically significant association between weekly sports activity and alcohol-related fighting among White and Hispanic adolescents, but not among African Americans (Swahn & Donovan, 2005). Accordingly, the relationship between physical training (weekly physical exercise) and youth assault-injury remains uncertain, and this uncertainty calls for further research. Therefore, including a variable of physical activity in my study might clarify this relationship.

Weapon carrying and/or use and youth assault-injury. The co-occurrence and the mutual associations between weapon carrying and youth assault-injury were apparent in relevant studies. Consistently, in such studies, researchers illustrated statistically significant associations between both variables, regardless of which was the predictor or the outcome (Cheng et al., 2006; Cunningham et al., 2011; Thurnherr et al., 2009). For example, when intentional injury was the outcome, Cunningham et al. (2011) reported that weapon carrying increased the intentional injury likelihood 2.31 times. Cunningham et al. (2006) found that carrying a knife was a statistically significant predictor for membership in the severe violence perpetration group compared with the nonviolence group. In Cheng et al.'s (2006) study of 143 youths presenting to EDs with assault-injury, Cheng et al. stated that 40% of the injuries were weapon-related.

Moreover, researchers found a consistent correlation between a history of physical violence and weapon carrying and use. For instance, Thurnherr et al. (2009) examined the characteristics of adolescents who carried weapons, these who did not, and these who used the weapon in a fight. On a stratified random sample of 7,548 Swiss adolescents, Thurnherr et al. analyzed an array of risk factors and behaviors for the three groups on three levels: school, family, and individual, which included problem behaviors (e.g., physical violence victimization history). Thurnherr et al. noted that males were more likely to carry and use weapons compared to females and that having been a victim of physical violence was a statistically significant predictor for weapon carrying among both males and females. Thurnherr et al. noted that having being a victim of physical violence in the past year did not predict weapon use in a fight. Correspondingly, Duckes et al. (2010) noted that physical bullying predicted higher weapon carrying among both male and female adolescents. In the physical bullying variable, Dukes et al. included items of physically attacking and threatening others, which might or might not result in injury. Carter et al. (2013) examined the predictors of weapon carrying among 689 14-24-year-olds presenting to ED with assault-injury: they reported statistically significant correlations of substance use and engagements in serious fights in the past six months with weapon carrying. According to the evident correlations between weapon carrying and use and youth assault-injury, I included these two variables in my study to illustrate their structure and patterns of interactions with other risk and protective behaviors and Addiction and Protection categories and youth assault-injury.

Risky sexual behavior and youth assault-injury. In the literature I reviewed, researchers did not examine the relationship between risky sexual behavior and youth assault-injury. In youth violence studies, however, authors either examined the predictors (including violence) of risky sexual behavior or compared gender and grade levels associations with problem behaviors co-occurrence (including violence and risky sexual activity; Chun & Mobley, 2010; Walton et al., 2011). In studies wherein researchers focused on the PBS, they observed relationships between violence, which included assault-injury and/or fighting and risky sexual behaviors. As an illustration, Childs (2014) examined the gender differences in the co-occurrence of different problem behaviors and health-related factors using a sample of 10,360 adolescents. Childs examined the co-occurrence among 16 problem behaviors including the number of sexual partners and past year engagement in unprotected sex. Among the health-related factors, Childs included violence victimization and measured this variable by items of past year experience of threats or injury by a weapon, attacks, and assault-injury, and witnessing weapon-related violence. Childs stated that latent class analyses resulted in a four-class model for males and three-class model for females controlling for age. Childs noted that the male model encompassed Abstainers, Substance Users with Sexual Risk-Taking, Experimenters, and High and Diverse Risk Behaviors groups. For females, the statistical tests resulted in the exclusion of the Experimenters' group. Childs reported that the probabilities of having one unprotected sexual encounter in the past 12 months were .20 among the Experimenters and .27 among the High and Diverse Risk Behaviors group. Childs (2014) also noted that among the female groups, the probabilities for having unprotected sex in the past year were .35 and .32 for the groups of Substance Users with Sexual Risk-Taking and High and Diverse Risk Behaviors respectively.

Childs' (2014) results are consistent with the results of Sullivan et al.'s (2010) study on the problem behaviors dimensionality. For the variable of not using a condom in the last sexual intercourse, Sullivan et al. reported probabilities equal to .307 for the group of Experimenters and .323 for the High and Diverse Risk Behaviors group. Sullivan et al. stated that among the High and Diverse Risk Behaviors group, the probabilities were .235 for having two sexual partners and .230 for having three or more sexual partners in the past three months. Given the absence of studies in which authors examined the relationship between risky sexual behavior and youth assault-injury and the co-occurrence of risky sexual behavior with violence, the relationship between these variables remains unknown. Including this variable in my study provided better understanding of this relationship.

Delinquency and youth assault-injury. Authors seldom included delinquency among youth assault-injury risk factors. In such studies, authors selected violence-related items for the delinquency variable and then reported no association between delinquency and assaulting or attacking others (Morash & Stevens, 2010). Such studies suffer from various limitations. One of the methodological limitations is the researchers' inclusion of physical assault in both the independent/delinquency variable and the dependent assault-injury variable (Morash & Stevens, 2010). In such cases, the statistical analysis results might reflect the difference in the dependent variable, but not the correlation between the two variables (Nau, 2014).

For instance, Morash and Stevens (2010) examined the predictors of male's and female's physical assault in late adolescence in their longitudinal study from 1997 (age 12 to 13) to 2002 (age 17 to 18) on a sample of 2,552 youths. Morash and Stevens produced the outcome variable from questions on the frequency of assaulting or attacking others in the data of 2002. Morash and Stevens included questions on the frequency of last year theft, selling drugs, destroying other people property, and assaulting others in the delinquency variable in the 1997 data. They noted that the delinquency did not predict physical assault in late adolescence for males and females. Morash and Stevens inclusion of assaults and attacking others in the assault and delinquency variables rendered their study results insufficient to draw a conclusion about the relationship between delinquency and youth-assault-injury. The limitations of the studies in which researchers examined the relationship between delinquency and youth assault-injury necessitate the discussion of this relationship in youth violence literature.

Authors with a focus on violence, which include assault-injury in the violence measures, reported inconsistent associations between delinquency and youth violence (Henry et al., 2010; López & Emler, 2011; Sullivan et al., 2006). For example, from a convenience sample of 115 adolescent (51% African Americans) presenting to ED in an urban area, Cunningham et al. (2006) generated three groups according to the responses to the past year various violence perpetrations. These groups were no violence, moderate, and severe violence. Cunningham et al. found no correlations between the nonviolent delinquency and any level of violence. Conversely, Henry et al. (2012) assessed nonviolent delinquency by items such as thefts, damaging other people property, painting graffiti, and cheating in tests. They measured violence by items of assault-injury and involvement in fighting. Henry et al. utilized longitudinal data of a random sample of 5,580 adolescents. They reported that the involvement in delinquency was a statistically significant predictor of violence in later grades. They also noted a statistically significant association between the avoidance of involvement in nonviolent delinquency and the avoidance of involvement in violence in later grades.

Likewise, Lin et al. (2011) assessed how three distinct violence victimization profiles affect youth delinquency. These profiles were violent victimization (experiencing), vicarious violent victimization (witnessing), and dual violent victimization (both experiencing and witnessing). Lin et al. assessed violent-victimization by items of being attacked or threatened with or without an object or a weapon. Lin et al. reported associations between the three groups and juvenile delinquency: the dual violence victimization was the strongest predictor for drug use and violent/property crime. In studies in which researchers focused on the problem behavior structure, the delinquent behaviors occurred simultaneously with violence (Willoughby et al., 2004).

The lack of rigor in assault-injury studies in which researchers examined the relationship between delinquency and youth assault-injury necessitates the inclusion of this variable in my study. The correlation between violence and delinquency in relevant research supported this inclusion. My study overcame the gap in youth assault-injury literature. My study results explained the inconsistent relationship between delinquency and violence in youth violence literature.

Aggression and youth assault-injury: violence predicts violence. In the literature I reviewed, the most persistent predictor of assault-injury was the history of violence including assault-injury (Ranney et al., 2011; Wiebe et al., 2011). Dukes et al. (2010) examined the concurrent associations of direct/physical aggression (physical bullying and physical victimization) and indirect/behavioral aggression (relational bullying and relational victimization) with assault-injury and weapon carrying among adolescents in a Colorado school district. Dukes et al. assessed the assault-injury by the respondent self-report of being injured by someone in a manner that required bandage or visiting a doctor in the past year. Dukes et al. reported a statistically significant correlation between the frequency of physical victimization and the frequency of assault-injury controlling for grades at school. Dukes et al. noted that this relationship was significantly higher among boys than among girls. They also found that the higher rate of relational aggression independently predicted greater frequency of assault-injury and that this association was similar for boys and girls. Also similar for adolescent boys and girls, Dukes et al. found a small, but statistically significant correlation between relational victimization and assault-injury.

Similarly, Wiebe et al. (2011) followed 95 adolescents who presented to an urban university ED with interpersonal (not with a partner) acute assault-injury for eight weeks. Wiebe et al. indicated that within eight weeks from the hospital discharge, 18.2% of the adolescents reported being beaten up by someone and 20.7% beating someone. From the follow-up, Wiebe et al. stated that 2.9% reported being injured by a weapon, 2.9% reported injuring someone with a weapon, and 12.9% were injured in a fight. Ranney et al. (2011) noted that 84.2% of the acute assault-injured adolescents presenting in the ED reported aggression against peers in the past 12-month, and that among the 190 adolescents with assault-injury, 55.8% reported past year assault-injury excluding the last visit to the ED. Cheng et al. (2006) also noted that almost half the adolescents who presented at the ED with assault-injury reported two or more fights in the past 12 months and that 45% of the assault-injured youths had a history of violence perpetration. These correlations between history of violence and future violence are persistent in youth violence research (Reingle et al., 2012). Research shows that the history of youth violence is a reliable predictor of youth assault-injury. Therefore, including variables of the history of violence in my research was necessary to examine their patterns, structure, and interactions with other variables and categories, and the influence of these patterns and interactions on youth assault-injury.

The Addiction Variables and Youth Assault-Injury

In Røysamb et al.'s (1997) multidimensional model, smoking, alcohol consumption, car driving while intoxicated, and risk behavior while intoxicated composed the Addiction category. Jessor (1987) included the adolescents' smoking, alcohol use, problem drinking, risky driving, and drug use among the problem behavior constructs in the PBT. In relevant research, authors illustrated inconsistent associations of smoking and drug use with youth assault-injury, but they found consistent associations of alcohol misuse with youth assault-injury (Cunningham et al., 2011; Mercado-Crespo & Mbah, 2013; Murphy et al., 2010; Rudatsikira et al., 2008; Sullivan et al., 2006; Swahn et al., 2004). In studies on youth assault-injury, researchers also illustrated correlations between risk behaviors while intoxicated and assault-injury (Sheppard et al., 2008; Walton et al., 2009). I discussed the relationship of each of the addiction-related variables with youth assault-injury in the literature to illustrate the rationale for including the variables in my study.

Cigarette smoking and youth assault-injury. Researchers with a focus on youth assault-injury found no associations between cigarette smoking and youth assault-injury (Cunningham et al., 2011). Other researchers illustrated a high percentages of cigarette smoking among assault-injured adolescents (Ranney et al., 2011). When authors examined adolescent violence, they illustrated inconsistent associations between cigarette smoking and adolescents' violence (Rudatsikira et al., 2008; Smith-Khuri et al., 2004;

Walton et al., 2009). Studies in which authors combined the use of different substances, including smoking, in one variable are abundant in the literature (Moon et al., 2010; Sussman, Skara, Weiner, & Dent, 2004). In such studies, researchers illustrated statistically significant associations between substance use and assault-injury or fighting. Unfortunately, these associations do not provide evidence of a relationship between cigarette smoking and youth assault-injury (Moon et al., 2010; Sussman et al., 2004).

When authors distinguished intentional from unintentional injury and the use of different substances, they illustrated an inconsistent relationship between cigarette smoking and adolescents' intentional injury. Cunningham et al. (2011) examined a list of the youth intentional injury risk factors including cigarette smoking. In the bivariate analysis, Cunningham et al. reported a statistically significant association between cigarette smoking and intentional injury compared to no-injury. Cunningham et al. noted that this relationship lost its significance in the multinomial regression analysis. Conversely, Ranney et al. (2011) described the characteristics of adolescents presenting to the ED with acute assault-injury, and they noted high rates of cigarette smoking in the past year among the male (38.1%) and female (34.4%) assault-injured adolescents.

In studies on youth violence, researchers found inconsistent relationships between smoking and violent behaviors (e.g., fighting, physical victimization; Rudatsikira et al., 2008; Smith-Khuri et al., 2004; Walton et al., 2009). Smith-Khuri et al. (2004) illustrated a correlation between smoking and fighting. They examined the violence-related behaviors among 11- to 15-year-olds in five countries including 5,168 adolescents from the United States. Smith-Khuri et al. included injury from fighting, bullying, engagement in fighting, and weapon carrying as the violence variables. Across the five countries, Smith-Khuri et al. noted statistically significant associations of smoking and alcohol use with fighting, whether frequent or not, controlling for country, sex, and grade at school. Unfortunately, Smith-Khuri et al. did not examine the associations between cigarette smoking and injury from fighting. Likewise, on a sample of 276 adolescents, mainly African Americans, Sullivan, Farrell, and Kliewer (2006) assessed the associations between different risk behaviors including substance use and peers' relational and physical victimization. Sullivan et al. reported statistically significant associations between smoking and alcohol use and physical victimization.

In contrast, Walton et al. (2009) examined the correlations between a list of risk behaviors, including cigarette smoking and adolescents' moderate and severe violence. Walton et al. included past year slapping and slamming others into a wall in the moderate violence variable. In Walton et al.'s study, the past year’s involvement in serious and group fights, causing injury to others, and using a weapon against others composed the severe violence variable. Walton et al. noted no statistically significant association between cigarette smoking and each of the adolescents' violence level: nonviolent, moderately violent, and severely violent. I examined if cigarette smoking correlates to assault-injury directly or as a component of the category of various addiction behaviors, which might occur simultaneously and reflect the adolescents' tendency toward Addiction. My assessment of youth assault-injury dimensionally provided a better explanation for the correlation between cigarette smoking and youth assault-injury.

Illicit drug use and youth assault-injury. Although Røysamb et al. (1997) did not include any drug use variable in the multidimensional model to examine the adolescents' health-related behaviors, Jessor (1987) suggested drug use as a youth problem behavior. In the literature I reviewed, there was an apparent ambiguity in regard to the drug use association with youth assault-injury. The first reason for this uncertainty was that authors frequently combined smoking, alcohol, and marijuana, and occasionally hard drug use in a single variable of substance use (Sussman et al., 2004; Walton et al., 2009). The second reason was that other authors combined various illicit drugs in one measure (Buckley et al., 2012; Rudatsikira, 2008). In studies where researchers utilized the joint substance use variables, many authors not only overlooked drug use frequency, but also dichotomized the responses to user and nonuser, which might have led to incorrect interpretations of the associations between the use of different drugs and youth assault-injury (Henry et al., 2012; Mercado-Crespo et al., 2013; Sheppard et al., 2008). The third reason was that in relevant studies, researchers illustrated an inconsistent relationship between the most-assessed drug, marijuana, and youth assault-injury (Mercado-Crespo et al., 2013; Sullivan et al., 2006). Further complicating the assessments of the relationship between drug use and youth assault-injury is the authors' inclusion of assault-injury with other violent behaviors, which might not result in injury, in a single variable (Walton et al., 2009; White et al., 2013).

Authors distinguished different substances in examining violence, but reported no associations between marijuana use and either youth violence or youth assault-injury. On a sample of 276 adolescents, primarily African Americans, Sullivan et al. (2006) assessed the associations between different risk behaviors, including substance use and the peers' relational and physical victimization. Sullivan et al. measured physical aggression by questions about hitting, slapping, shoving, and pushing a peer in the past month. Except for the alcohol use items, Sullivan et al. did not combine the items in the drug use subscale, and they reported statistically significant associations between smoking and alcohol use and physical victimization. Sullivan et al. stated that marijuana use did not predict physical victimization. Although Sullivan et al.'s study is limited to a restricted geographic area and contains an oversampling of African Americans, their results are consistent with Cunningham et al.'s (2011) results. Cunningham et al. distinguished smoking, marijuana, and alcohol use in their examination of the youth intentional injury risk factors. In the bivariate analysis, Cunningham et al. reported a statistically significant association between marijuana use and intentional injury compared to no-injury. Cunningham et al. noted that this relationship lost its significance in the multinomial regression analysis. These results are not consistent with the results of researchers who focused on youth violence.

For example, Mercado-Crespo et al. (2013) illustrated an association between marijuana use and adolescents' physical aggression. Using a sample of 14,103 adolescents, from youth risk behavior survey data of 2007, Mercado-Crespo et al. assessed the associations of race, ethnicity, marijuana use, and alcohol use with adolescents' physical aggression: involvement in the past year in at least one fight. Mercado-Crespo et al. reported a statistically significant increase in the physical aggression likelihood among youth who reported marijuana use in the past year, compared to non-users "(OR = 3.18, 95% CI [2.53, 4.00])" (p. 1377) controlling for age, sex, and race and ethnicity.

Studies in which researchers combined all drug use in one variable further complicate the understanding of the relationships between use of various drugs and youth violence. For example, Rudatsikira et al. (2008) combined marijuana with other illicit drugs in one variable. They noted a statistically significant positive correlation between drug use and fighting on school property. Since marijuana is not a consistent predictor of assault-injury, and marijuana might decrease the likelihood of aggressive behavior (White et al., 2013), this combination makes it hard to determine which drug influenced the drug use association with fighting on school property.

In general, researchers reported inconsistent correlations between marijuana use and youth assault-injury and violence. Studies in which authors examined the associations between use of hard drugs and youth assault-injury were absent in the literature I reviewed. However, researchers who examined problem behaviors' co-occurrence, consistently illustrated correlations of physical victimization and direct aggression with illicit drug use (Sullivan et al., 2010; Willoughby et al., 2004). The inclusion of a marijuana use variable in my study explained that marijuana use has a direct influence on youth assault-injury, it was a component of addiction pattern, and it was a component of a generalized problem behavior. The lack of studies in which researchers examined the correlations between the use of various drugs and youth assault-injury supported the inclusion of hard drug use variables in my research to examine their relationship, if any. My research results expanded the understanding of the relationships between the use of different drugs and youth assault-injury.

Alcohol use, problem drinking, and youth assault-injury. Studies in which researchers illustrated correlations between alcohol misuse and youth assault-injury are abundant in the literature (Cunningham et al., 2011; Murphy et al., 2010; Swahn et al., 2004). Linakis et al. (2009) utilized a nationally representative sample for 13- to 20-year-olds who visited EDs from 2001 to 2004. Linakis et al. categorized injuries as self-inflicted, assault, or unintentional and combined assault and self-inflicted injuries in the intentional injury variable. In their retrospective cross-sectional study, Linakis et al. examined the relationships between the adolescents' alcohol use and their injury-related visits to ED. Linakis et al. noted that injuries were significantly more likely to be intentional for alcohol-related visits compared to nonalcohol-related visits. Linakis et al. reported no statistically significant differences between alcohol and nonalcohol-related unintentional injuries. Linakis et al.'s study is not free of limitations.

Linakis et al. (2009) discussed the study limitations, which included the differences between coders in classifying alcohol use and the absence of medical measures for alcohol misuse (e.g., binge drinking). The combination by Linakis et al. of assault and self-inflicted injuries in the intentional injury variable might be misleading because of the differences in the characteristics and the risk factors between self-harmful and violent adolescents (Nock, Prinstein, & Sterba, 2009; Nock, Joiner Jr. Gordon, Lloyd-Richardson, & Prinstein, 2006). Accordingly, the influence of Linakis et al.'s combination of self-inflicted and assault-injury on the study results is unclear. Linakis et al.'s research results remain consistent with other authors' results illustrating the statistically significant association between alcohol misuse and youth assault-injury (Cunningham et al., 2011; Swahn et al., 2004; Sullivan et al., 2010).

Cunningham et al. (2011) examined the injury risk factors, among 14- to 18-year-olds presenting to an ED between September 2007 and September 2008 (n = 1,128). Cunningham et al. assessed the alcohol use frequency and quantity using items from the alcohol use disorders identification test (AUDIT), which included questions of the past year daily frequency of alcohol use and the frequency of drinking five or more drinks on one occasion. Cunningham et al. stated that 768 respondent reported injuries and that the non-injured group was a reference for all statistical tests. Cunningham et al. found no statistically significant association among marijuana use, binge drinking, and weapon carrying and unintentional injury compared to the no-injury group. Cunningham et al. noted the statistically significant 1.94 times increase of the likelihood of intentional injury with binge drinking. Swahn et al. (2004) also reported higher likelihood of fighting, assault-injury, and injuring others among respondents who reported binge drinking, problem drinking, peer drinking, and recurrent drinking compared with these who did not report these patterns.

Similarly, Murphy et al. (2010) examined the relationship between alcohol use and psychological distress and the violent intentional injury among 67 youths presented with facial injuries at two urban trauma centers in Los Angeles. Murphy et al. reported statistically significant differences of the mean AUDIT scores among three injury groups: adolescents with unintentional injury, one type of intentional injury (either from fighting or from being attacked), and both types of intentional injury. They noted that the group that experienced both types of violent injuries had the higher score. Murphy et al. observed that the unintentional injury group had the lower score. Accordingly, I included alcohol misuse and binge drinking in my research, since authors found that only binge drinking and alcohol misuse predicted youth assault-injury. This inclusion provided better understanding of the underlying structure of youth assault-injury among variables of addiction behaviors and other variables and categories.

Driving while intoxicated and youth assault-injury. In the literature I reviewed, authors focusing on youth assault-injury did not integrate risky driving behaviors with the risk factors. When authors included risky driving with other risk factors, they embedded driving while intoxicated with other risky driving behaviors, such as a joyride and riding a motorbike on the road, in one variable, and then combined intentional and unintentional injury in another variable (Buckley et al., 2012). In such studies, authors reported statistically significant correlation between risky driving and adolescents' injury (Buckley et al., 2012).

Other researchers distinguished groups of 19- to 20-year-olds with different levels of risky driving, which included drinking and driving, driving while under illegal drug influence, and speeding, then they examined the differences in risk factors between these groups (Vassallo et al., 2007). In such studies, authors showed that higher aggressive behaviors were statistically significant predictors of greater risky driving among young adults. Authors who distinguished adolescents' groups according to the level of involvement in various problem behaviors reported relatively high mean percentages of driving while intoxicated among moderate and high problem behaviors involvement groups (Childs, 2014). Researchers with a focus on youth violence included risky driving among the predictors, and then reported a statistically significant correlation between risky driving and violence (Logan-Greene et al., 2010). In such studies, in addition to assault-injury, the violence variable encompassed items of witnessing and experiencing different types of violence (e.g., sexual abuse).

Unfortunately, the above researchers' studies results, though many are statistically significant, might not be sufficient to establish an evident relationship between driving while intoxicated and youth-assault-injury. These limitations and the lack of studies wherein researchers examined driving while intoxicated and youth assault-injury supported the inclusion of this variable in my study. This inclusion highlighted a relationship between driving while intoxicated and youth assault-injury.

Risk behaviors while intoxicated and youth assault-injury. In youth assault-injury research, authors illustrated statistically significant correlations between fighting while intoxicated and assault-injury. For instance, from the data of a national representative sample of adolescents presenting to EDs, Linakis et al. (2009) found that injuries were significantly more likely to be intentional for alcohol-related visits compared to non-alcohol-related visits. Sheppard et al. (2008) estimated the percentages of alcohol and drug involvement at the time of the assault-injury incidence. Using the Maryland Trauma registry data of 2,189 adolescents, Sheppard et al. reported the actual percentages of alcohol and/or drug occurrence, which varied from 62% to 72% among assault-injured youths with known alcohol and/or drug involvement. They estimated this occurrence among adolescents with unknown alcohol and/or drug use to be from 54% to 66%. Researchers who examined the alcohol-related fighting risk factors illustrated statistically significant associations among problem drinking, marijuana use, and fighting while intoxicated (Kodjo, Auinger, & Ryan, 2004; Swahn & Donovan, 2006; Walton et al., 2009).

Researchers also reported statistically significant correlation between having sexual intercourse while intoxicated, violence, and carrying weapons. Walton et al. (2011) examined correlates among risky sexual behavior, other problem behaviors (e.g. violence, school failure, and carrying a weapon), and demographics. They collected data from participants 14– to 18- year-olds presenting to ED in an urban area. Among sexually active youth who composed 60% of the 1,576 cases in the sample, Walton et al. reported statistically significant correlation between having sexual intercourse while intoxicated and peer violence and carrying weapons. In the literature I reviewed, researchers did not examine the relationship between having sex while intoxicated and youth assault-injury.

Accordingly, I included risk behavior while intoxicated in my research to examine youth assault-injury comprehensively. To complete the list of variables that may compose the underlying structure of youth assault-injury, it was necessary to discuss youth assault-injury protective factors in the literature.

Youth Assault-Injury Protection Variables

The protection variables vary considerably between Røysamb et al.'s (1997) list of variables and Jessor's (1987) conventional behavior construct. Røysamb et al.'s (1997) protective behaviors were proper diet, dental hygiene, using safety equipment, and wearing a seatbelt. The protective behaviors in Jessor's (1987) PBT are church attendance and school performance, which reflect the adolescents' compliance with social norms. Since Røysamb et al. (1997) focused on adolescents' health-related behaviors, their choice of health-related protective variables, which reflect a healthy lifestyle, is reasonable. However, there is still a need for theory that explains the relationships between these variables and adolescents assault-injury (León, Carmona, & García, 2010).

In the literature I reviewed, researchers did not examine the relationship of proper diet, dental hygiene, using safety equipment, and wearing seatbelt with youth assault-injury. In studies on problem behavior syndrome, authors illustrated significant correlation between the adolescents' low rating of their health status (e.g., poor health) and greater involvement in various problem behaviors compared to adolescents who rated their health as excellent (Childs, 2014). Other authors examined the relationship between adolescents' consumption of soft drinks and aggressive behaviors; they then reported that greater consumption of soft drinks significantly correlated with higher adolescents' aggression (Solnick, & Hemenway, 2014; 2012). Conversely, when authors focusing on the PBS included healthy diet and dental hygiene with the protective factors, they illustrated no significant influence of these variables on the members of violent groups (León et al., 2010; Sullivan et al., 2010). When authors included wearing a helmet as a risk factor, they reported a significant association between the failure to wear a helmet and adolescents' injury (Buckley et al., 2012). Unfortunately, in such studies the authors did not distinguish intentional from unintentional injury (Buckley et al., 2012).

Since Røysamb et al.'s (1997) protective behaviors reflect adolescents' predisposition toward a healthy and safe lifestyle, even without supporting theory and youth assault-injury research, I included proper diet, dental hygiene, using safety equipment, and wearing a seatbelt in my research but not in the following discussion of protective variables. The inclusion of these variables in my research explained their relationship with youth assault-injury. In the following, I discussed the two protective behaviors from Jessor's (1987) PBT as they relate to youth assault-injury and violence. These variables are religiosity and school performance.

Youth assault-injury and religiosity. Studies in which authors examined the relationship between religiosity and youth assault-injury are absent in the literature I reviewed. A few authors did examine the relationship of religiosity and youth violence, and showed inconsistent correlations between these variables (Baier, 2014; Resnick et al., 2004; Salas-Wright et al., 2014; 2012). For instance, Salas-Wright et al. (2012) examined the associations between different levels of religious involvement and substance use, violence, and delinquency among 17,705 adolescents. Salas-Wright et al. measured violence by three variables: the adolescents' self-report of past year involvement in fights, in group fights, and in violent attacks. Salas-Wright et al. noted that the latent factor analysis resulted in five distinct religious involvement classes: Disengagement, Infrequent, Private Religion, Regular, and Devoted groups. Salas-Wright et al. reported statistically significant associations of the membership in the Religiously Devoted group and the Religiously Regular group with a decrease in past year engagement in fights compared with the Disengaged group. Salas-Wright et al. noted that membership in the igh involvement in Private Religion group, which does not entail public engagements in religious activities, did not influence problem behaviors. Accordingly, Salas-Wright et al. stated that the social norms and controls that accompany religiosity have a critical role in decreasing problem behaviors among youths. Wright et al.'s study results are inconsistent with other researchers' results.

Other researchers illustrated no association between religious-related activity on the one hand and youth violence and a statistically significant protective effect of the perceptions of religion as important on youth violence on the other hand. For instance, Sinha et al. (2007) studied the associations between religious activity and youth risk behaviors using a nationally representative sample of parents and adolescents. Sinha et al. used the perceptions of the importance of religion, participation in religious services, and participation in faith-based activities as the religion core variables. Sinha et al. examined the relationships among these three variables and ten risk behaviors, including interpersonal violence (e.g., hit or threatened others) and weapon carrying. Sinha et al. noted only a statistically significant correlation between the perception of the importance of religion and a decrease in the likelihood of interpersonal violence. Sinha et al. noted that the church attendance and participation in faith-based groups did not decrease interpersonal violence. Researchers' contradictory results on the influence of religiosity on violence, and the absence of studies in which researchers examined the relationship between religiosity and youth assault-injury, highlight the importance of including religiosity in the present study. Such inclusion might have provided better understanding of the relationship between religiosity and youth assault-injury, if any.

School performance and youth assault-injury. In studies on youth assault-injury, researchers rarely included school performance, and so could illustrate no significant correlation between failing grades and youth intentional injury (Cunningham et al., 2011). Researchers with a focus on youth violence frequently used different concepts (e.g., grade average level, connectedness to school, and educational expectations) to examine the relationship between school performance and youth violence. In such studies, authors reported inconsistent relationships between school performance and youth violence. When authors did illustrate statistically significant correlations between the two variables, they found that school performance has bidirectional effects (risk and protection) on the likelihood of violence. Resnick et al. (2004) examined the risk and protective factors for future violence perpetration in a longitudinal study using data from 13,110 adolescents who participated in two waves of the National Longitudinal Study of Adolescent to Adult Health (Add Health). Resnick et al. measured violence, which was the outcome variable, in the second wave, by items of past year fight, assault-injury, and weapon threat or use against others. They noted a statistically significant association between repeating a grade and future violence perpetration by males, controlling for demographics. Resnick et al. also noted statistically significant protective influence of the males' grade average level and future violence perpetration. Resnick et al. stated that school connectedness and grade average level were statistically significant protective factors for the females' future violence perpetration. The results of the Resnick et al. study are consistent with those of Henry et al. (2012). Henry et al. found that among the protective factors, positive school achievement (the teachers' report of the adolescent's study skills) had a statistically significant protective effect on later violence, controlling for demographics and the interventions (schools were subject to three interventions and one control). Henry et al. noted that poor school achievement became a statistically significant risk factor for later violence with negative study skills.

Conversely, other authors found no association between school performance and youth violence. For instance, Bernat et al. (2012) utilized the data of Add Health Waves II and III. They measured violence by items that included hurting others, involvement in serious fights, and using a weapon in a fight. Bernat et al. examined a number of violence risk and protective factors, and they observed no associations between the grade-point average and attachment to school and future youth violence. Herrenkohl et al. (2012) reported that only the attachment to school at age 10 to 12 was a statistically significant protective factor for violence at age 13 to 14, controlling for sex, race, poverty, and individual factors. Herrenkohl et al. reported no significant associations between the school performance variables at age 10 to 12 and age 13 to 14 and violence likelihood at age 15 to 18 controlling for sex, race, poverty, and individual factors. The limited amount of research in which authors examined the correlation between school performance and youth assault-injury, and the inconsistent results of studies on youth violence, support the need for my study. In my study, I examined the relationship of the school performance variable with youth assault-injury. My research results were critical to overcome the gaps in youth assault-injury and violence literature.

Youth Assault-Injury Covariates

In many of the studies on youth assault-injury, authors reported demographics-related statistically significant differences in the likelihood of assault-injury as well as in its risk and protective factors. Differences existed between males and females, older and younger ages, the various races, and low and high SES (Cunningham et al., 2011; Melzer-Lange et al., 2007; Ranney et al., 2009; Simpson et al., 2005). These differences are not consistent across all studies on youth assault-injury. Other authors reported no differences between assault-injured female and male adolescents in race, age, and SES (Ranney et al., 2011; Ranney & Mello, 2011).

Many researchers found that the variables of male gender and White/Caucasian race predict youth intentional injury (Cunningham et al., 2011; Melzer-Lange et al., 2007; Ranney et al., 2009). Ranney et al. (2009) utilized the medical records of 446 adolescents presented to the EDs of Hasbro and Rhode Island Hospital with firearm and cutting injuries from 2004 to 2007 to examine the differences in characteristics between intentionally and unintentionally injured adolescents. Ranney et al. also observed statistically significant association between the male gender and White/Caucasian race and youth assault-injury compared to females and African Americans respectively. As well, Cheng et al. (2006) found a statistically significant greater number of weapon-related injuries and previous fights among males compared to females. Cunningham et al. (2011) noted that male gender was a statistically significant predictor of the adolescents' past year intentional injury. Cunningham et al. stated that African American race was not a predictor for the adolescents' intentional injury, but this race was a statistically significant predictor for the adolescents' unintentional injury. Thurnherr et al. (2009) observed that males were more likely to carry and use weapons in fights compared to females. Dukes et al. (2010) reported a statistically significant higher correlation between the rate of physical victimization and the frequency of injury among boys compared to girls.

Conversely, other researchers reported no differences between assault-injured female and male adolescents in race, age, and socioeconomic status. For example, Ranney et al. (2011) examined the differences between male and female adolescents in the age, race and ethnicity, SES, past year violence, assault-injury, and alcohol and drug use. Ranney et al. stated that the sample of 190 youths encompassed 64 females, 121 nonwhite, and 112 from low SES. Ranney et al. measured the SES by the adolescent's receipt of public assistance. Ranney et al. noted that the multivariate analysis by sex illustrated no differences between males and females in age, race and ethnicity, and SES. Ranney et al.'s oversampling of nonwhite, low SES, and male adolescents might restrict the generalization of their study results. Ranney and Mello (2011) assessed the differences in age, race, and SES between 235 male and 150 female assault-injured adolescents who presented at an urban city trauma center. Ranney and Mello used insurance status as a proxy for SES; they found no statistically significant difference between assault-injured males and females in the variables of age, race and ethnicity, and SES.

In relevant research, authors illustrated correlations between older age and adolescents' intentional injury. Freed, Milzman, Holt, and Wang (2004) conducted a retrospective study using 1992 to 1999 data from a major trauma center in Washington, DC. Freed et al.'s study sample included 2,191 patients 18 years and younger who presented to the trauma center with weapon-related injury. They found statistically a significant increase in the gunshot and stabbing wounds starting at age 14, and noted that the risk of gunshot and stabbing wounds continued to rise sharply until age 18. Freed et al. reported an increase in assault-injury at age 15, and subsequent increases at age 16 and then at age 17. Sheppard et al. (2008) indicated that older age predicted the alcohol and/or drug use involvement in assault-injury incidence compared with younger age.

Conversely, Stoddard et al. (2013) examined the demographic covariates correlations with youth violent behavior. From the data of 726 adolescents who presented to an urban ED and reported past year aggressive behavior, Stoddard et al. observed a statistically significant correlation between older age and a decrease in violent behavior. They also found no association among race, sex, SES, and adolescents' violent behavior.

The SES correlation with youth assault-injury is not consistent across relevant studies. For instance, Simpson et al. (2005) found statistically significant associations among low SES, increased risk of fighting injuries, and serious injuries that required hospitalization. Simpson et al. also reported correlations between high SES and increased risk of sport-related injuries. Cunningham et al. (2014) noted that parent or self receipt of public assistance was a statistically significant predictor for future assault-injury related visits to ED among illicit drugs user adolescents compared with nondrug user adolescents. Cunningham et al. (2011) reported no relationships between family receipt of public assistance and past year assault-injury among youth visiting ED for assault-injury compared to adolescents with unintentional injury-related visits. Since researchers with a focus on youth assault-injury showed correlations between demographic characteristics and youth assault-injury, I controlled for age, sex, race and ethnicity, and SES to eliminate any confounding effects of these variables on the results of statistical analyses. Controlling for these variables also related to my focus on youth assault-injury risk and protective behaviors, not characteristics.

Summary and Conclusions

This literature review described my literature review strategy and highlighted the absence of studies in which authors examined youth assault-injury etiology and/or dimensionality by using an inclusive list of the risk and protective factors of Jessor's (1987) problem behavior system. In this literature review, I discussed the limitations of Røysamb et al.'s (1997) list of variables that necessitate including Jessor's (1987) suggested variables in my research. The literature I reviewed in this chapter described inconsistencies among the correlations between the protective behaviors and many of the risk behaviors and youth assault-injury. This literature review also demonstrated that it was unknown if the interactions between the categories of risk and protective behaviors' contributions to the variations of youth assault-injury explain these inconsistencies.

This literature review further revealed various limitations of youth assault-injury research and the lack of research wherein authors examined the relationships among risky sexual activity, physical training, use of various illicit drugs, driving while intoxicated and youth assault-injury. The review highlighted the potential importance of my study in filling the gaps in the literature. I used PBT, the multidimensional model, and an adequate list of variables in examining the structure, relationships, patterns, and interactions of these variables that underlie youth assault-injury; my examination provided a better understanding of this significant problem. The use of a cross-sectional quantitative design and appropriate statistical analyses allowed me to answer my study questions and examine my research hypotheses. The following chapter included a detailed discussion of my research design and methodology.

Chapter 3: Research Method

My purpose in conducting this cross-sectional quantitative study was to examine if the construct of Røysamb et al.'s (1997) multidimensional model explains the underlying structure of American youth assault-injury. In this study, I compared first-order variables (physical training, weapon carrying and use, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking, alcohol misuse, car driving while intoxicated, risk behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing a seat belt, religiosity, school performance, and school connectedness) and second-order factors (High Action, Addiction, and Protection) to the variable of assault-injury at the third-order level, while controlling for age, sex, race, and SES. My subsequent aim was to use the construct of the multidimensional model to examine the structure and patterns of the relationships between variables at the third-order level and categories at the second-order level and youth assault-injury.

I begin this chapter with a discussion of the present study design and the rationale for using this design. Second is a comprehensive explanation of the parent study methodology and the present study population, sampling, instrumentation, and data analysis plan. Third is a discussion of the internal and external threats to the study validity. Fourth is an explanation of ethical procedures. The chapter ends with a summary and a transition to the next chapter.

Research Design and Rationale

In this survey cross-sectional quantitative research, the component variable was youth assault-injury. The indicator variables were the youth assault-injury related variables that produced the second-order categories in Røysamb et al.'s (1997) multidimensional model plus additional variables from Jessor's (1987) behavior system. In Røysamb et al.'s multidimensional model, first-order variables created the three factors/categories of the second-order level: High Action, Addiction, and Protection. In my research, the variables of the High Action category included physical training, speeding in cars, carrying and use of weapons, risky sexual behavior, delinquency, and aggression. The Addiction category variables were smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, and risky behavior while intoxicated. The Protection category variables were proper diet, dental hygiene, using safety equipment, wearing a seatbelt, religiosity, school performance, and school connectedness. Control variables were age, sex, race, and SES.

My choice of design involved fulfilling various requirements related to the research questions and the theoretical foundation. The present study questions addressed correlations between independent and dependent variables. Answering these questions necessitated using statistical analysis, which required quantitative data on the specific variables (Creswell, 2013). A survey design allows generalization of results to the study population (Creswell, 2013). Quantitative observational survey design was appropriate to examine relationships between human behaviors and a particular outcome in the real world and to test a theory (Punch, 2014). My purpose was to examine the structure of risk and protective behaviors, which underlie youth assault-injury. The main theoretical assumption, which buttressed this examination, was the co-occurrence of these behaviors. This co-occurrence necessitated using cross-sectional, not longitudinal, design.

The cross-sectional design is the most frequent design in social science. It allows examining patterns of relationships between variables, which are not manipulated, and an outcome. This design, however, is not sufficient to establish causal relationships between variables (Frankfort-Nachmias & Nachmias, 2008). Supporting my choice was the frequent use of this design by researchers to examine the dimensionality of the PBS (Childs, 2014; Hair et al., 2009; Reingle et al., 2012; Sullivan et al., 2010; Willoughby et al., 2004). For testing the applicability of Røysamb et al.'s (1997) model to American youth assault-injury, my use of a design similar to Røysamb et al.'s study design (a quantitative cross-sectional design) seemed appropriate.

I used the cross-sectional data from the 1996 National Longitudinal Study of Adolescent to Adult Health (Add Health) Wave II in-home interview survey. These data included a representative sample of American adolescents (Harris, 2009). The cross-sectional design using secondary data does not require time and resources for collecting data. This method allows examination of the characteristics of a large population from a small number of individuals (Creswell, 2013).

Using cross-sectional designs, researchers have supported the multidimensionality of PBS, but not youth assault-injury (Childs, 2014; Hair et al., 2009; Reingle et al., 2012; Sullivan et al., 2010). In addition, inconsistencies existed in regard to the relationships between protective factors and a few risk factors, and youth assault-injury (Cunningham et al., 2011; Mercado-Crespo et al., 2013; Sinha et al., 2007; Salas-Wright et al., 2014; 2012). However, it is unknown whether the interactions between the categories of risk and protective behaviors' contributions to the likelihood of youth assault-injury explain these inconsistencies. My use of quantitative observational cross-sectional design overcame earlier researchers' failure to examine the variation and the underlying structure of youth assault-injury comprehensively according to Jessor's (1987) problem behavior system constructs and interrelations.

Methodology of Parent Study: Add Health

In my research, I used secondary data from Wave II in-home interview of the Add Health study. This dataset included variables of sampling weight. These variables allowed calculating the population estimates. My study population included all American adolescents in 1996 that enrolled in Grades 7 to 11 in the school year 1994-1995. Add Health is a longitudinal study, which started in 1994 as a response to "the U.S. Congress mandate to fund a study of adolescent health" (Harris, 2013, p. 2). Researchers followed a representative sample of adolescents who were in Grades 7 to 12 in 1994-1995 over the following years. The Add Health study is still proceeding: researchers started a fifth wave in 2015. The Wave II sample, which I used in my study, is derived from the Wave I sample. Therefore, it seemed critical to discuss the sampling and sampling procedures in Waves I and II.

Sampling, and Sampling Procedures of Add Health Wave I

In Wave I, researchers employed stratified random sampling techniques, with probability proportion to size, to select 80 high schools that had Grade 11 students and a minimum enrollment of 30 students (Harris et al., 2009). The stratification criteria included U.S. high school size, type, and percentage of White, census region, and distribution of school location among urban, rural, and suburban (Harris et al., 2009). Among the eligible schools, 70% agreed to participate. Researchers replaced the schools that declined to participate with schools from the same stratum of the original school using the main selection criteria plus the additional criteria of the percentage of African American students, the census division, and the grade span (Harris et al., 2009). These procedures generated 80 schools that were representative of the 26,666 high schools in the United States.

Researchers asked the high schools to identify feeder schools that offer Grade 7 and send at least five students to high school annually. Except for the high schools that have Grades 7 and 8, researchers randomly selected a feeder school for each high school and replaced schools that declined to participate. These sampling procedures resulted in the selection of 132 schools with enrollment of less than 100 to over 3,000 students in 80 different areas across the United States (Harris et al., 2009). Researchers selected a nationally representative sample of adolescents from these schools.

Population, Recruitment, and Data Collection in Wave I

In Wave I, from the 132 schools, researchers collected in-school data from school administrators who completed a 30-minute questionnaire. Researchers also collected data from students in Grades 7 to 12 who were attending school at the interview administration dates during the period September 1994 to April 1995. The total sample of this in-school 45- to 60-minute self-administered survey was 90,118 students. These students, in addition to students who did not complete the questionnaire but were in the school roster composed a nationally representative sample of all American adolescents in Grades 7 to 12 in the 1994-1995 school year. This representative sample was the sample frame for the core sample of Wave I in-home interview survey (Harris et al., 2009).

After cross-stratifying the sample frame by grade and sex, researchers randomly selected 17 students from each stratum at each school (almost 200 students from each pair of schools). This selection produced the study's core sample of 12,105 adolescents: a nationally representative sample of adolescents enrolled in Grades 7 to 12 in U.S. schools in the school year 1994-1995. Seventy-nine percent of all students participated in the 90-minute in-home interview (Harris, 2013). After obtaining written informed consent forms from a parent or legal guardian and the adolescent, researchers interviewed these 12,105 participants in their homes between April and December 1995. In addition to the core sample and according to the students’ responses to the in-school survey, researchers generated special oversamples of various ethnicities, disabled students, genetic sample of twins and siblings, and students' social network (saturation). Since I used sampling weight variables that overcame the oversampling of various groups in the data, a discussion of these special oversamples seemed irrelevant. Researchers followed the core sample in 1996 for Wave II, in 2001-2002 for Wave III, and in 2008-2009 for Wave IV.

Recruitment and Data Collection in Wave II

Following Wave I, researchers collected data of Wave II between April and August 1996. In this wave, researchers conducted a 90-minute in-home interview with 14,738 participants (including the core sample and the oversamples). This sample included adolescents who were in Grades 7 to 11 in Wave I, the adolescents in Grade 12 who were in the genetic and adopted samples, and an additional small number of participants who did not contribute in Wave I. In Wave II, researchers did not interview the disabled and those who were at Grade 12 in Wave I.

The University of North Carolina (UNC) School of Public Health Institutional Review Board (IRB) approved the in-home interview procedures. The IRB guidelines are based on the Code of Federal Regulations on the Protection of Human Subjects 45 CFR 46 (Harris, 2009). Researchers informed parents via U.S. mail and their children (through their schools) prior to data collection. For each in-home interview, researchers obtained written informed consent forms from a parent or legal guardian and the adolescent. Researchers collected the data using a computer-assisted personal interview (CAPI) and an audio CASI portion for the sensitive health and risk behavior questions. The latter minimized the influence of the interviewer on the adolescent's responses.

In Wave II, from the in-home interviews, researchers collected a vast array of data, which cover almost all aspects related to the adolescent's characteristics, personality, and risk and protective behaviors. Researchers also collected contextual behaviors about adolescents' relationships with peers, siblings, family, and romantic relationships, as well as additional contextual data. The contextual data included information about the participating adolescents' residential neighborhood and communities from responses and other resources (e.g., CDC, National Center for Health Statistics, U.S. Census Bureau). In addition to the adolescents' responses, researchers collected family and school context data from parents and school administrators (Harris, 2013).

Summary of Waves III and IV

Between August 2001 and April 2002, researchers conducted the follow-up Wave III. They collected data through in-home 90-minute interviews with 15,170 of participants (in the core sample and the oversamples) in Wave I who became 18- to 26-year-olds. The response rate in this wave was 77.4% (Harris, 2013). Similar to former waves, researchers recorded all answers on laptop computers. The interviewers followed the Waves I and II protocol: the interviewer reads the question and enters responses into a laptop computer, and the respondent reads and enters the answers to sensitive questions into a laptop privately using headphones. This wave included collection of participant's biological specimens at the end of the interview (Harris, 2013). In this wave, data included Wave I questions and additional questions pertaining to the late adolescent and young adulthood relationships in their context (e.g., parent-child relationship, political participation).

For the Wave IV follow-up, from January 2008 to February 2009, researchers re-interviewed 15,701 of the participants in Wave I (80.3% response rate). The participants had become 24 to 32 years old at this wave. The 90-minute in-home interview also followed the previous waves' protocol for sensitive and other questions. The survey questionnaire for this wave included questions from former waves and further questions related to the early adulthood context and relationships (e.g., occupational stressors, financial resources, parenting). Researchers at the end of the interviews collected physical measurements, biospecimen, and DNA samples. Researchers also collected contextual data about the community and neighborhood and the participants' move to another location.

Sampling and Sampling Procedures of the Present Study

My use of Wave II restricted-use data allowed me to answer my research questions. These cross-sectional data encompassed appropriate assessments of almost all my study's variables. These assessments included adolescents' physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various use of various illicit drugs, alcohol drinking patterns, driving while intoxicated, risky behavior while intoxicated, diet, dental hygiene, using safety equipment, wearing a seatbelt, religiosity, school performance, and school connectedness (Harris et al., 2009). The Wave II data also included appropriate measures for the adolescent's age, sex, race and ethnicity, and SES.

The Wave II restricted-use dataset was available through a contractual agreement with the UNC at Chapel Hill. This dataset contained the 1996 Wave II in-home interview data and additional contextual data, including the interviewer's responses to questions on the adolescent's home environment and neighborhood characteristics. This dataset included interviews with 14,738 respondents 11 to 21 years of age. Because some of the risk behaviors become acceptable in young adulthood (e.g., drinking alcohol), I excluded participants who were age 19-to 21-year-olds from the dataset. I also excluded cases with missing sampling weight values. These exclusions resulted in a total sample n = 12,623 of American male and female adolescents 11 to 18 years of age; which made the Wave II data the most appropriate data set for my study.

Sample size. An adequate statistical test power increases the probability of rejecting a false hypothesis. The statistical test power relates to the level of significance α, the sample size, and the effect size. In SEM, adequate sample size is critical to assure that values of parameters estimates are equal to the population values, standard errors are not over- or under-estimated, and the number of cases is adequate for convergence into a proper solution/model (Wolf, Harrington, Clark, & Miller, 2013).

Various guidelines exist for adequate samples size for SEM. These guidelines include, for example but not limited to, a minimum of 100 to 200 cases, 10 cases for each variable, and a ratio equal to 20:1 for the sample size to the number of free parameters (Bentler, & Chou, 1987; Tanaka, 1987; Wolf et al., 2013). Given these guidelines, the present study's sample size n=12,623 seemed appropriate. These rules do not include considerations for the model characteristics, such as the type of model, missing data, and model likely rejection (model fit/propriety; Wolf et al., 2013). For SEM, calculating the adequate sample size according to the required power for a test of model fit was critical to avoid accepting a false hypothesis or an improper solution.

Using Preacher and Coffman's (2006) web utility for computing power and minimum sample size, I conducted a sample size calculation for the root mean square error of approximation (RMSEA). For the following values: α = .01, power: 1-β = .99, arbitrary close fit for the null hypothesis H_0: $\varepsilon_0 \geq 0.05$, arbitrary extreme fit for the alternative hypothesis H_a: $\varepsilon_a = 0.01$, and a degree of freedom df = 10 (k (k – 1)/2 where k is the number of independent variables), the required sample size is n = 222. According to the above information and calculations, my study's sample size n = 12,623 is appropriate to assure RMSEA test's power 1-β = .99. This value of the test power maximized the probability of rejecting a false hypothesis at a significance level α = .01.

Procedures for Gaining Access to the Dataset

The Carolina Population Center (CPC) at UNC distributes the restricted-use data to researchers who hold a confidentiality certificate from the Department of Health and Human Services and who are willing to maintain limited access to data. Entering into a contract with the CPC to obtain the dataset necessitated submitting various documents. These documents included the IRB approval of the proposal (The IRB approval number for this study is 05-18-15-0265179) and the sensitive data handling, storing, and securing plan, confidentiality certificate, the investigator's plan for sensitive data security, and signing an agreement to keep the data confidential. Harris (2013) stated, "Add Health has been a pioneer in the secure release of confidential data with an enlightened dissemination strategy" (p. 2). Indeed, the data suppliers safeguarded the data against any potential deductive disclosure: the dataset does not include student identification numbers. Protecting respondents' identity from deductive disclosure is a major concern for federal agencies and researchers, and a requirement of the ethical code of conduct in research (CDC, 2014c).

The contractual agreement with the CPC obliges users to agree on terms of data use. These terms included taking extra precautions to protect respondents from any deductive disclosure and protect data from any unauthorized use. The data storage processes should include copying data only once and restricting the access to data (e.g., saving the CD-ROM in a locked cabinet, creating a password for accessing the data file), saving the analytical tests results but not the data files, and shredding printouts no longer in use. Data use should be exclusively for statistical analysis and research purposes (Harris, 2009). Users should inform the CPC of any unintentional discovery of any of the research subjects. The contractual agreement of restricted-use data included obligations for investigators, research staff, and the researchers' institution as follow:

- The data use should be solely for statistical analysis with no attempt to identify or publish sensitive data on individual or family level.
- The investigators should inform the CPC within 24 hours of any accidental identification of individual, family, households, school, and/or geographic area. In such a case, the researchers should destroy all documents related to such identification according to the CPC guidelines.
- To eliminate the risk of deductive disclosure, the cross-tabulation and figures should always contain more than three cases, tables' rows and columns should include more than one cell for all cases, and the data combination with other known data should not permit any disclosure.

- Except for the persons who signed the agreement, no other persons are allowed access or use of the data.
    - The investigator should comply with the data security plan and any requirements from Add Health related to this plan and should allow Add Health personnel to inspect the physical housing and handling of data and related information's files.

After gaining IRB approval of the study proposal and the sensitive data security plan, my dissertation Chairperson submitted a signed contract with the required attachments (Appendix C) to CPC at UNC to obtain the dataset.

Instrumentation and Operationalization of Constructs

The Add Health Wave II in-home interview questionnaire contained 39 sections. These sections included the adolescents' demographics, behavior, perspectives, knowledge, relationships in the social context, and socio-economical context. The questionnaire also included a section for the interview settings and a section for the interviewer’s remarks. The measurements varied significantly among sections that included the items that I selected for operationalizing the present study variables. The instrument included scales, multi-item composites, and individual characteristics. Add Health researchers developed the various measurements of the instrument using different approaches. They reported appropriate internal consistency reliability estimates for the majority of scales, but not for the multi-item composites.

The Instrument's Validity and Reliability

Scales. Except for the additional detailed questions in the nutrition section and the questions about sun exposure, the Wave II questionnaire is identical to that of Wave I (Harris et al., 2009). Add Health researchers used a deductive construct-orientation approach to developing the scales in the questionnaire. During the theoretical phase, researchers randomly split the final sample of Wave I into two halves: an exploratory sample for constructing the multi-item scales empirically and a validating sample for cross-validating the scales internal consistency. Based on theory, they grouped items according to their content into potential scales. They calculated Cronbach's alpha of each scale with and without each of the items in the scale. They deleted items if they were less correlated with the scale total then other items in the same scale and if the deletion of the item increased the scale's alpha coefficient > .02 (Sieving et al., 2001).

Sieving et al. (2001) reported internal consistency reliability estimates of the scales' standardized items from the validating sample. These estimates were .82 for violence, .78 for deviant behavior, .75 for school connectedness, .74 for weapon carrying, .66 for victimization history, and .65 for substance use with sex. Sieving et al. noted that the small reliability of the later two scales relates to the low response to the problem behavior (e.g., being shot), which skewed the response distribution. Sieving et al. reported the Pearson *r* coefficient of the two items measure of religious identity =.53. Sieving et al. also reported no significant changes in the internal consistency reliability estimates among Grades 7 to 8 and 9 to 12 or the gender and various ethnic and race groups.

Multiitem composites. For the multi-item composites of alcohol use, marijuana use, contraceptives and condom use, and cigarette smoking, Add Health researchers did not calculate the internal consistency reliability estimates (Sieving et al., 2001). They developed these measures "from items following logical skip patterns, whereby participants who gave a negative response to an initial question did not answer remaining questions in that section" (Sieving et al., 2001, p.76). Add Health researchers did not calculate the internal consistency reliability estimates for the theory-supported measure of grade point average since they expected inconsistent responses to the items in this assessment. Udry (2001) noted, "It should be recalled that the survey instrument and its components were extensively pilot tested. Questions were revised as necessary in response to pilot test results" (p.1). Udry, however, invited investigators to assess the questionnaire validity and reliability using various approaches. In the literature I reviewed, there were no further explanations for the Add Health Waves I and II instruments validity and reliability.

I selected appropriate items for operationalizing the variables from the questionnaire, which quantitatively assessed responses through nominal, ordinal, interval, and Likert-type scale measurements (see Appendix D for a list of Wave II questions). I based my selection of items on the literature review, the present study questions, and the dataset components. Tables A1 and A2 illustrates detailed explanations of all the variables and their related questions' measurements, types, wording, and coding in the Wave II questionnaire.

The Component Variable: Youth Assault-Injury

Cunningham et al. (2011) defined assault-injury as weapon-related and physical fight-related injury and injury from being physically attacked and physically attacking someone. In Add Health Wave II dataset, researchers collected the responses for section 29, fighting and violence, using audio CASI. From this section, I extracted five questions that reflected the adolescents' self-report of their experience and/or perpetration of injurious violence.

The first question addressed the frequency of the adolescent's experience of being shot by a firearm during the last 12 months. The second question addressed the frequency of the adolescent's experience of a cut or a stab from a weapon other than a firearm during the last 12 months. The third question asked the rate of the adolescent's perpetration of shooting, cutting, and/or stabbing another person during the last 12 months. The fourth question inquired about the frequency of the adolescent's experience of a physical-fight-related injury that required medical treatment in the past 12 months. The fifth question addressed the frequency of the adolescent's perpetration of a physical-fight-related injury that required medical treatment in the past 12 months (see Table A1 for a detailed explanation of the questions).

I recoded each of the five questions to a new dummy dichotomous variable with two values: 0 for no assault-injury and 1 for self-report of any assault-injury in the last 12 months. I computed a sum score variable for assault-injury from these five items. A value of 0, in the composite variable, reflected no assault-injury and all values greater than 0 indicated that the adolescent was engaged in assault-injury events as either a victim or perpetrator in the past 12 months. I calculated and reported the internal consistency reliability estimate (Cronbach's alpha) for the items that composed this variable in Chapter 4.

The Indicator Variables

The indicator variables included the adolescents' problem and protective behaviors, which constructed the behavior system in the PBT, as well Røysamb et al.' (1997) assault-injury-related variables. Researchers illustrated associations between problem drinking and alcohol misuse, aggression, and weapon carrying and use, and youth assault-injury (Cheng et al., 2006; Cunningham et al., 2011; Ranney et al., 2011; Wiebe et al., 2011). Researchers have also reported contradictory results about the correlations between cigarette smoking, marijuana use, delinquency, school performance, school connectedness, and youth assault-injury (Cunningham et al., 2011; Morash & Stevens, 2010; Ranney et al., 2011; Resnick et al., 2004). Research is lacking on the relationships among physical training, risky sexual activity, car speeding, various illicit drug use, driving while intoxicated, religiosity, proper diet, dental hygiene, using safety equipment, wearing a seatbelt, church attendance, and youth assault-injury.

Physical training. Sullivan et al. (2010) defined physical training by the amount of regular exercise in the past month. Røysamb et al. (1997) also used the time spent in sports per week to measure physical training. From section 2 of the Wave II questionnaire, I extracted a question that measures the rate of the active sport participation (e.g., baseball, softball, basketball, soccer, swimming, football) in the past week (See Table A1 for details about this question).

Speeding in cars. Unfortunately, the dataset did not include any question in regard to speeding in cars. In the questionnaires, there are questions about risky driving (e.g., wearing a seatbelt, driving while intoxicated). Since I used these questions for operationalizing other variables, I excluded speeding in cars from the statistical analysis.

Carrying and use of weapons. Thurnherr et al. (2009) defined carrying a weapon as having carried any weapons (e.g., firearm, bat, or knife) at least once in the past 12 months. They defined weapon use as using any of these weapons in a fight in the past 12 months. Accordingly, I selected four questions from sections 29 and 28 that reflected the frequency of the adolescent's carrying and use of weapons in the past 12 months. The first three questions asked whether the adolescent pulled a knife or a gun on someone, used a weapon in a fight, or carried a weapon at school in the previous year. The fourth question addressed the frequency of use or threatening to use a weapon to get something from someone in the past year (See Table A1 for details about these questions). These items were appropriate for operationalizing the carrying and use of weapons, even with my exclusion of the questions of weapon-related injury, which I employed in the outcome variable.

I recoded each of the four questions to a new dummy dichotomous variable with two values: 0 for never or none and 1 for any self-report of carrying or use of weapons in the last 12 months. I computed a sum score variable for carrying or use of weapons from these four items. A value of 0 in the composite variable reflected no weapon carrying or use; all values greater than 0 indicated that the adolescent carried and/or used a weapon in the past 12 months. I calculated and reported the internal consistency reliability estimate (Cronbach's alpha) for the items that composed the new composite variable in Chapter 4.

Risky sexual behavior. Sullivan et al. (2010) defined risky sexual behavior as not using a condom during the most recent sexual intercourse and/or having two or more sexual partners in the past three months. Childs (2014) defined this variable as having one or more unprotected sexual encounters, no use of any birth control method in the past 12 months, and having two or more sexual partners. I selected three questions from section 23: contraceptives and from section 25: nonromantic relationship history, which were among the audio CASI self-administered portion of the interview. The first question asked about the rate of condom use in sexual intercourse since the previous interview of Wave I. The second question was about the frequency of birth control use since the previous interview. The third question inquired about the number of sexual but not romantic partners since the Wave I interview (See Table A1 for details about these questions).

I recoded the condom use variable to a dummy variable with two values: 2 for using a condom all the time and 1 for all other rates of not using a condom all the time when the respondent has had sexual intercourse since the Wave I interview (the past year). I also recoded the contraceptives use variable to a dummy variable with two values: 2 for using contraceptives (by the respondent or the partner) all the time and 1 for all other rates of not using contraceptives all the time when respondent has had sexual intercourse since the Wave I interview. I recoded the question about the number of people with whom the adolescent has had a sexual relationship, excluding romantic relationship partners, since the Wave I interview to a dummy variable. The new variable had two values: 2 for having one partner and 1 for having two or more partners. From the three dummy variables, I computed a sum score variable for risky sexual behavior. Values greater than 0 and less than 8 indicated that the adolescent has engaged in various levels of risky sexual behavior and a value of 8 indicated that the adolescent has not engaged in risky sexual behaviors. I estimated and reported the Cronbach's alpha for the items that composed the new composite variable.

Delinquency. Herrenkohl et al. (2012) defined nonviolent delinquency as stealing and breaking into buildings (e.g., store, house, school) without permission. López and Emler (2011) defined delinquency in two instances: offending and antisocial behaviors. They defined offending behaviors as thefts, robberies, criminal damages to other people's properties, and selling drugs. Their definition of antisocial behaviors included having been rude or noisy in public places, painting graffiti on other people’s or public properties, annoying neighbors, and being rude to others. Since I used questions about interpersonal aggression in other variables, the delinquency variable will include the adolescents' nonviolent delinquency. In the dataset, there was a delinquency scale (See Appendix E), which included 14 questions, two of which were on violent delinquency. I excluded the two violent delinquency items (threatening someone with a weapon and involvement in group fight) from the scale and recalculated the scale reliability with the remaining 12 items (See Table A1 for details). I computed the 12 items into a delinquency sum score variable using STATA commands. A value of 0 on this scale indicated no engagement in any delinquent behavior in the past 12 months. The values 1 and greater reflected the frequency of the adolescent's engagement in one or more delinquent behaviors in the past 12 months.

Aggression. Pickett et al. (2009) defined aggression as the frequency of adolescent's engagement in physical fighting and the frequency of physical bullying of peers in the past year. Chun and Mobley (2010) defined aggression as engagement in a serious fight, injuring others, and engagement in a group fight in the past year. Other authors included being a perpetrator or a victim of hitting, kicking, grabbing, shoving, and threatening (Dukes et al., 2010). For operationalizing the aggression variable, because I included injurious and weapon-related aggression in other variables, I selected two questions that included noninjurious and nonweapon-related violence. These questions addressed the frequency of the adolescent's involvement in a serious fight and/or a group fights in the past 12 months (See Table A1 for details about these questions). Both questions had the same measurement level. Therefore, after estimating and reporting their Cronbach's alpha, I computed a sum score variable from both items. A score of 0 in this variable indicated noninvolvement in aggression behaviors and the other scores indicated various levels of involvement in aggression behaviors.

Cigarette smoking. Cunningham et al. (2011) defined cigarette smoking as the frequency of smoking in the past year. From the Wave II questionnaire, audio-CASI section 27: tobacco, alcohol, and drugs, I selected one question for this variable. This question inquired about regular, daily cigarette smoking for 30 days since the Wave I interview (See Table A1 for details about these questions).

Illicit drug use. Cunningham et al. (2011) defined marijuana use as the rate of smoking marijuana in the past year. Rudatsikira et al. (2008) described drug use as any use of marijuana and hard drugs (e.g., heroin, ecstasy, glue, cocaine). I selected five questions that addressed an adolescent's use of marijuana and other illicit drugs. The first question addressed the frequency of marijuana use since the Wave I interview. The second question asked about the frequency of cocaine use since the Wave I interview. The third question addressed the frequency of the adolescent's use of inhalants, such as glue or solvents, since the Wave I interview. The fourth questions inquired about the rate of the adolescent's use of any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, or pills, without a doctor's prescription. The fifth question asked the frequency of taking an illegal drug using a needle in the past 30 days (see Table A1 for details about these questions). In the literature I reviewed, research was lacking on the relationships between each of the illicit drug used and youth assault-injury. Researchers reported inconsistent results in regard to the relationships between marijuana use and youth assault-injury; therefore, I used each item as an independent variable.

Problem drinking and alcohol misuse. Various authors utilized the alcohol consumption frequency, quantity, binge drinking in the past year, and/or having being drunk at least once in the past 30 days to define problem drinking and alcohol misuse (Walton et al., 2009; Thurnherr et al., 2009). From the audio CASI section: 27, I selected three questions: the number of drinks the adolescent usually has each time he/she has had drink in the past 12 months, the daily frequency of drinking five or more drinks at one sitting in the past 12 months, and the number of days the adolescent has gotten drunk or "very, very high" on alcohol in the past 12 months (see Table A1 for details about these questions).

I recoded the first question into a dummy variable with two values: 0 for fewer than five drinks and 1 for five or more drinks the adolescent usually has each time he/she has had drinks in the past 12 months. I recoded the second question into a dummy variable with two values: 0 for never and 1 for any number of days the adolescent drank five or more drinks at one sitting in the past 12 months. I also recoded the third question into a dummy variable with 0 for never and 1 for any number of days the adolescent has gotten drunk or "very, very high" on alcohol in the past 12 months. I calculated and reported the Cronbach's alpha for these three items and then computed them into a sum score variable of binge drinking and alcohol misuse. For the binge drinking and alcohol misuse composite variable, a value of 0 indicated that the respondent never had five or more drinks on any day in the past 12 month; the greater values indicated binge drinking and/or alcohol misuse in the past 12 months.

Driving while intoxicated. The frequent definition of this variable is operating a motor vehicle while under the influence of an alcoholic beverage, marijuana, or controlled drugs (Texas Department of Transportation, 2014).. Zakletskaia, Mundt, Balousek, Wilson, and Fleming (2009) defined adolescents' alcohol-impaired driving as the past six months self-report of driving a car after drinking alcohol and riding in a car with a driver who had being drinking alcohol. For this variable, I selected two questions from section 27 and one question from section 30: audio CASI joint occurrence of problem behaviors. The first question inquired if the adolescent ever operated a motor vehicle while drunk since the Wave I interview. The second question asked if the adolescent has ever operated a vehicle while high on drugs since the Wave I interview (see Table A1 for details about these questions). The Cronbach's alpha of a composite variable that included the two items of driving while intoxicated was relatively small. Therefore, I used each item as an independent variable.

Risky behavior while intoxicated. For this variable, I selected eight questions that addressed the frequency of adolescents' weapon carrying, involvement in a physical fight, and having sexual intercourse while drunk or under the influence of illicit drugs. The first two questions asked if the adolescent have used drugs or drank alcohol while carrying a weapon in the past 12 months. The third question concerned the frequency of getting into a physical fight in the past 12 months because the adolescent had been drinking. The fourth and the fifth questions asked if the adolescent had been drinking when he/she got in the last fight and if he/she was drunk. The sixth and seventh questions inquired if the adolescent was drunk or had been using drugs when he/she most recently had sexual intercourse. The last question asked if the adolescent had gotten into a fight when he/she had been using drugs since the Wave I interview (see Table A1 for details about these questions).

Since all questions, except the third question, are dichotomous, I recoded the third question to a dummy variable with two values: 0 and 1. A value of 0 indicated that the adolescent has never gotten into a physical fight because she/he had been drinking, and the value 1 reflected that the adolescent has gotten into a physical fight because she/he had been drinking in the past 12 months. I estimated and reported the Cronbach's alpha of the eight items. I computed a sum score variable for risky behavior while intoxicated. In the composite variable, the value of 0 indicated that the adolescent never engaged in risk behaviors while intoxicated in the past 12 months. The greater values indicated engagement in one to seven risk behaviors while intoxicated in the past 12 months.

Proper diet. Various authors defined proper diet as the frequency of eating fruits and low-fat food (León et al., 2010; Sullivan et al., 2010). Section 4 of the Wave II questionnaire included a vast array of questions that addressed the adolescent's dietary intake during the previous day (see Table A1 for detailed explanations). Using the SPSS compute variable, after estimating the Cronbach alpha, I computed a sum score variable from 21 dichotomous questions (yes or no) that addressed the previous day's intake of various types of fruits, beans, vegetables, tofu, and nuts. In the composite variable, a value of 0 indicated that the adolescent did not eat any fruits, vegetables, beans, tofu, or nuts; values greater than 0 reflected the amount of healthy items that the adolescents consumed on the previous day.

Dental hygiene. Only two questions address dental hygiene in the questionnaire. One addressed wearing braces on teeth and the other asked if the adolescent had a dental examination by a dentist or a dental hygienist in the past year. Although these two questions did not address the daily practice required for dental hygiene, they reflected attention to dental hygiene. Since not wearing braces may indicate healthy teeth free from malocclusion, I used only the question that asked if the adolescent had a dental examination by a dentist or a dental hygienist in the past year (see Table A1 for detailed explanations).

Using safety equipment. Røysamb et al. (1997) defined using safety equipment as using a reflector during night walking and a safety jacket when in small boats. Neither of these items existed in the questionnaire. Therefore, I selected a question, which marked the frequency of wearing a helmet when riding a bicycle in the past year. The values of the responses ranged from never to always (see Table A1 for detailed explanations).

Wearing a seatbelt. I selected one question, which addressed the frequency of an adolescent's wearing a seatbelt when riding in or driving a car. The values of the responses ranged from never to always (see Table A1 for detailed explanations).

Religiosity. Sinha et al. (2007) defined a religion variable as the adolescent's perceptions of the importance of religion, participation in religious services, and participation in faith-based activities. From section 36, I selected four questions for operationalizing this variable. The first question asked about the frequency of attending religious services in the past 12 months. The second and third questions inquired about the adolescent's perception of the importance of religion and the frequency of prayer, respectively. The fourth question addressed the frequency of the adolescent's participation in faith-based activities in the past 12 months (see Table A1 for detailed explanations).

I planned to recode the religious activity questions to new variables with ascending values from 0 for never; 1 for less than once a month; 2 for once a month or more, but less than once a week; and 3 for once a week or more. I also planned to recode the question about the adolescent's perception of the importance of religion into a new variable with ascending values: 0 for not important at all, 1 for fairly unimportant, 2 for fairly important, and 3 for very important. I estimated the Cronbach alpha for the composite scale of these new variables. I computed a sum score variable from the four items. The sum score variable included values that range from 0 to 8. A value of 0 indicated that the adolescent never attended any religion-related activities and that he/she perceives religion as unimportant. Values of 1 to 4 reflected infrequent religion-related activities and/or the adolescent's perception of religion as somewhat unimportant. Values of 5 and 8 indicated frequent religion-related activities and/or the adolescent's perception of religion as important. In Chapter 4, I explained the adjustment of recoding items that composed this variable.

School performance. Various authors defined school performance as grade-point average for English, math, science, and history (Bernat et al., 2012; Herrenkohl et al., 2012). For this variable, I choose four questions about the grade-point average scores in English, mathematics, history, and science. I estimated the Cronbach's alpha for these new variables. I computed a sum score variable from the four items. Values of 1 to 4 in the new variable indicated good school performance while the value of 4 and greater indicated low school performance.

School connectedness. Bernat et al. (2012) defined school connectedness as feeling close to people at school, feeling a part of the school, feeling happy at school, feeling that teachers treat students fairly, and feeling safe at school. I selected five Likert scale questions that asked about the adolescent's level of agreement or disagreement with feeling close to people at school, feeling a part of the school, feeling happy at school, feeling that teachers treat students fairly, and feeling safe at school (see Table A1 for details). I estimated and reported Cronbach's alpha of these questions and computed them into a sum score variable for school connectedness where higher average scores indicate lower school connectedness.

The Covariates

Age. In the dataset, the variable age was calculated based on the calculation of adolescent age according to his/her report of their date of birth.

Sex. This variable included the interviewer report of adolescents' biological sex and has two values 1: male and 2: female.

Race. This variable measurement included one question that asked if the respondent is of Hispanic or Latino origin and other questions that asked if the respondent is White, Black or African American, American Indian or Native American, Asian or Pacific Islander, or other.

SES. Carter et al. (2013), Cunningham et al. (2011), and Ranney et al. (2011) defined socioeconomic status as the receipt or not of public assistance. Schlack et al. (2013) defined SES as a score of parents' occupation, education, and net income. From sections 14 and 15, I selected six questions; two questions asked about the education level and two questions concerned the occupation of the mother and the father with whom the adolescent lives and two questions asked if either the mother or the father receives public assistance, such as welfare (See Table A1 for details about these items). I recoded the residential mother and father education level to new variables with three values: 0 for less than high school, 1 for high school graduate but less than college, and 2 for college graduate and beyond. A value of 0 indicated low education. A value of 1 reflected medium education level and a value of 2 indicated high education level. I recoded the questions of the occupation of the residential mother and father to new variables with three values from 0 for the answer *none* (no working parent), 1 for Blue- and Pink-collar workers, and 2 for White-collar workers. I also computed a sum score variable for the mother and father receipt of public assistance with values 0 to 2. A value of 0 indicated that both residential parents receive public assistance; a value of 1 indicated that either the residential mother or the residential father receives public assistance, and a value of 2 indicated that neither the mother nor the father receives public assistance. I calculated and reported the Cronbach's alpha for the five items and then I computed an average score variable of the five items. Average score lower than .60 indicated low SES; scores greater than .06 and lower than 1.2 reflected a medium and scores greater than 1.2 indicated high SES.

Data Analysis Plan

I used the Statistical Package for Social Science (SPSS) and STATA 14 software for dealing with data and LISREL 9.2 conducting SEM to test the present study hypotheses and answer its questions. I conducted SEM on the Wave II restricted-use data of in-home interview. From this dataset, I selected cases that fulfilled the age ≤ 18 and eliminated the cases with ag e> 18. This selection resulted in a total sample size *n* = 12,623.

Data Cleaning and Screening Procedures

For facilitating the analytical processes, I created a separate subset of data from the indicator, component, control, and sample weight variables. I excluded cases 18 years and older using SPSS. In SEM, outliers affect the indices of model fit, the standard errors, and the parameter estimates and might result in improper solutions. I examined the patterns of the missing values in the dataset after recoding the variables. I explored the pattern of missing values using the nested pattern of missing values and the nesting rules that describe the pattern. For each variable's missing values that illustrated potential correlation with other variables' missing values, I created a binary indicator variable (observed value = 0 and missing value =1). I conducted pairwise correlation analysis for each of the indicator variables with all other variables. I examined whether large or moderate correlations among the indicator variables of missing values and the other variables exist. This examination allowed determining whether data were missing at random.

Regardless whether missing data were at random or at complete random, LISREL software provides the option for performing Full Information Maximum Likelihood (FIML), also known as raw-data maximum likelihood. Researchers illustrated that FIML outperforms listwise, pairwise, similar response pattern imputation (SRPI), and other methods of missing data deletion for both data missing at random (MAR) and data missing at complete random (MACR; Enders, & Banderols, 2001). This function provided appropriate estimates of the maximum-likelihood (ML) parameter and standard errors for the model. FIML uses the available information in each case to maximize the case ML function and the overall ML function.

Study Questions and Hypotheses

In the multidimensional model, Røysamb et al. (1997) excluded a few constructs of the behavior system in the problem behavior theory (Jessor, 1977). These constructs were delinquency, use of various illicit drugs, aggression, risky sexual behavior, school performance, school connectedness, and religiosity variables. In relevant studies, researchers who examined the PBS dimensionality, consistently reported that aggression variables loaded on a separate relevant category in the second-ordered level of the multi-dimension models (Childs, 2014; Chun & Mobley, 2010; Mobley & Chun, 2013; Willoughby et al., 2004). Moreover, in few studies do researchers examined the relationships between delinquency and risky sexual activity and youth assault-injury. Accordingly, I included religiosity, school connectedness, and school performance among the protective category variables since the problem behavior theory supports their protective influence on problem behavior likelihood. I included the aggression, delinquency, and risky sexual activity among the high action variables.

Neither Jessor's (1977) PBT nor Røysamb et al.' (1997) model accounted for demographic characteristics. In relevant studies, researchers reported the confounding role of demographic characteristics on youth violence and assault-injury. I did not intended to examine the model according to the adolescents' demographic characteristics (e.g., males and females, older adolescents and younger adolescents). Therefore, I included and controlled these variables in the model. This inclusion minimized the potentiality of testing an under-identified model.

Research Question 1

Does the construct of the multidimensional model explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES?

Null hypothesis H_0: The construct of the multidimensional model does not explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES.

Alternative hypothesis H_a: The construct of the multidimensional model does explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES.

Data Analysis Plan

Descriptive statistics. I used SPSS and STATA descriptive statistics to describe the demographic characteristics of the sample. I reported the age, sex, race, and SES proportions in the sample's population. Using descriptive statistics, I examined the distribution of the study variables and the frequency and percentages of assault-injury and the risk and protective behaviors in the sample.

Multivariate analysis. For answering the research questions, taking into account the complexity of data, I used SEM, which allows exploring complex and multidimensional interrelationships and paths among a set of variables with different measurement levels simultaneously. SEM provides graphical interference and ability to fit even non-standard models (nonnormally distributed and incomplete data). It concurrently tests overall model fit and individual parameter estimates. SEM also allows comparing regression coefficients, means, and variances across numerous between-subjects groups.

The SEM assumptions. There are four assumptions for conducting SEM (Ullman, 2006). The first assumption is a large sample size. In SEM, small sample size will result in convergence failures (no solution), improper solutions, and inaccurate parameter estimates. The guidelines suggested a sample size of at least 100 cases for a model with two to four factors or 15 cases for each parameter. The present study sample size n = 12,623 does not validate this assumption. The second assumption is a normally distributed and continuous endogenous/dependent variable. To assure compliance with univariate and multivariate normality assumption, I used Satorra-Bentler (S-B) scaled chi-square (χ^2) test statistic (Bryant & Satorra, 2012). This function produces robust estimates of the χ^2 goodness of fit test, parameter estimates, and standard errors in large samples when data violate univariate and multivariate normality. In LISREL 9.2, I performed the S-B scaled χ^2 by including the asymptotic covariance matrix as weight matrix along with the maximum likelihood (ML) command in the model setup. S-B scaled χ^2 test statistic is also appropriate when data violate the assumption of independence of factors and errors (Ulman & Bentler, 2004).

The third assumption is appropriate handling of missing data. LISREL allowed computing FIML, which makes use of all available information in the data. The fourth assumption is model specification based on theory. Specification errors may result from omitting relevant variables from the systems of equations in SEM. The specification errors may also bias the parameter estimates and may influence the power of other parameters' test in the model. In the present study, in addition to the relevant variables and their specific interrelationships in Røysamb et al.'s (1997) empirical model, I selected variables that reflected all the constructs of the behavior system in Jessor's (1977) PBT. (see Figure 1).

The model estimation and test statistics. As the first step in conducting SEM, I specified the structural equation model in the form of a path diagram of the multidimensional model in LISREL graphics (see Figures B1 and B3). The SEM translates the relations in the diagram into equations and then estimates the model. The results of the maximum likelihood test allowed me to simultaneously examine the ability of the hypothetical multi-dimensional model to explain the underlying structure of youth assault-injury among the High Action, Addiction, and Protection and their related indicator variables and the relationships between and among these variables while controlling for age, sex, SES, and race.

Basically, SEM is a concurrent sequence of multiple linear regressions model with one dependent variable (y): $y = i + Xb + e$, where y is observed values on the dependent variable, i is the y-intercept, X is the model's matrix of independent variables, b is the regression weights, and e is disturbance or residual or error unexplained by the model (Fox, 2002). In SEM, the structural model for latent variables η is $\eta = \alpha + \mathrm{B}\eta + \Gamma \mathrm{x} + \zeta$, where α is a vector of intercept, B is the matrix of structural parameters, Γ is regression parameter matrix for regressions of latent variable(s) η on explanatory variable(s) x, and ζ is a vector of disturbance (Muthén, 1984; Ullman, 2006).

The SEM produces an overall test of model fit and tests of individual parameter estimates, unstandardized regression coefficients and their standard errors, standardized regression coefficients, and squared multiple correlation (R^2) for the regression equations (the proportion of variance in the dependent variable explainable by the set of the predictors). After data cleaning and screening, I tested the ML, which included estimation of population parameters. In the outputs of the ML test, I included standardized estimates (standardized solution), squared multiple correlations, sample moments (covariance matrix), residual moments (the covariance matrix of the residuals), factor score weights, indirect, direct, and total effect, the covariances of estimates, and the modification indices.

Results interpretation.

The model evaluation. The first step was evaluating the overall fit of the model and checking for the test errors and warnings. The output included the χ^2 test statistic of absolute model fit, its degrees of freedom, and significance level *p*. A statistically significant χ^2 indicates that the model is not consistent with the data and allows accepting the first hypothesis. It is difficult to interpret the χ^2 test statistic, because this test is highly sensitive to departure from multivariate normality and its estimation bases on the sample size; a large sample size produces an inflated χ^2. This χ^2 test is $(N - 1)\ F_{\min}$. N is the sample size and $F_{\min}$ is the value of the function minimum of F, that is

> $F = (s - \sigma(\Theta))W(s - \sigma(\Theta))$, where s is the vector of... the observed sample covariance matrix, σ is... the vector of the estimated population covariance matrix..., and (Θ) indicates that σ is derived from the parameters (the regression coefficients, variances and covariances) of the model. W is the matrix that weights the squared differences between the sample and estimated population covariance matrix (Ullman, 2006, p.42).

Therefore, to be able to draw a conclusion about the model adequacy, I examined the descriptive measures of fit in the output, which included various fit indexes.

Of the multiple fit indexes in LISREL outputs, the less sensitive to large sample size were the baseline comparisons and RMSEA. These indexes place the theoretical model on a correspondent value on a continuum with an independent model, where variables are completely uncorrelated on one end and a saturated/perfect model on the other end. The values on this continuum range from 0 for no fit to 1 for perfect fit (Ullman, 2006). These baseline comparisons include normal fit index (NFI), relative fit index (RFI), incremental fit index (IFI), Tucker Lewis Index (TLI), and comparative fit index (CFI), which is the one that I used. Among these indexes, the rules of thumb for a good fit vary from .80 for NFI to .95 for the CFI and the value of one indicate perfect fit (Ullman, 2006). The other index that I used is RMSEA. RMSEA is a residual based fit index that estimates the lack of fit of the hypothesized model compared to a perfect/saturated model. RMSEA estimation values ≤.06 indicate a good fit of the hypothesized model. Values ≥.10 indicate poor fit of the model.

The values of the multidimensional model fit in CIF and RMSEA with a good fit or close fit suggest that the model is adequate. These values illustrate (1) evidence that the construct of the multi-dimensional model explains the underlying structure of youth assault-injury among the independent variables while controlling for demographic variables; and (2) evidence that some of the independent variables are significant indicators of youth assault-injury. The values of the multidimensional model fit indexes with poor fit of the model suggest that the model is inadequate and allow accepting the first hypothesis.

However, the fit indexes may result in conflicting evidence (Ullman, 2006). Therefore, I did not draw a conclusion without examining the fitted residuals, not the standardized residuals, for examining misfit in the model for two reasons. First, LISREL calculates standardized residuals based on the normality assumption. My study's variables violation of the assumption of multivariate normality may bias the standardized residuals. Second, LISREL results of observed standardized residuals are not precise and may result from rather an arbitrary scaling of the observed variables' residuals (Jöreskog, Sörbom, & Yang-Wallentin, 2006). In LISREL, the fitted residuals illustrate the difference between the sample covariance and the tested model's covariance matrixes. Small fitted residuals values illustrate good fit and large values indicate poor model fit.

From the test outputs, I also examined the squared multiple correlations that is the percentage of variance of the mediating (High Action, Addiction, and Protection) variables and the dependent variable that the predictor variables explain. It was critical to examine the *areas* of misfit in the model, before making a judgment about accepting or rejecting the first research hypothesis.

Three issues necessitated exploring the misfit in the model components. The first issue was the lack of research into the relationships among delinquency, risky sexual activity, illicit drug use (except marijuana use) and youth assault-injury. The second issue was the lack of theoretical explanation, in the problem behavior theory, about the relationships among physical training, dental hygiene, proper diet, using safety equipment, wearing a seatbelt, and youth assault-injury. The third issue was the potential differences between the population of Røysamb et al.'s (1997) study (Norwegian adolescents) and the population of the present study (American adolescents). These three issues may have resulted in a potential misspecification of the factors and intercepts and misspecification of particular parameters.

The modification indices produce tabulations that include additional paths in the model. For each of these paths, the test statistics results provide the amount of reduction in the overall chi-square of model fit. I explored the severe misfit in the modification indices. Accordingly, I re-specified the model base on the misfit that did not affect the model's theory-related substantive meaning. After re-specifying the model, I repeated the ML test statistics and followed the above steps in interpreting its results. The test statistics results of the modified model allowed me to make the decision about rejecting the first null hypothesis.

Research subquestion 1. Does the construct of the multidimensional model explain the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and the latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES?

Null subhypothesis H_{01}: The construct of the multidimensional model does not explain the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and the latent factors of High

Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES.

Alternative subhypothesis H_{a1}: The construct of the multidimensional model explains the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and the latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES.

Interpretation of parameter estimates. LISREL software provides two options for interpreting the results: detailed tables and a visual representation of the parameter estimates on the path diagram of the model. For testing the first subhypothesis, I examined the unstandardized regression weight estimates, standard error estimates, and critical ratio z that is the unstandardized coefficient estimate divided by its standard error. The unstandardized regression coefficients provided the amount of change in the dependent or mediating variable for each one-unit change in the independent variable. I examined the p values for each estimate to test the null subhypothesis H_0: the structure of the multi-dimensional model does not explain the relationships among the independent variables while controlling for the demographics variables. The p values $\leq .05$ illustrate that a variable is a significant predictor of the mediating or the dependent variable. Since the variables in the study have different levels of measurement, I examined the standardized regression coefficient estimates, which illustrate the changes in the mediating' or dependent variable's standard deviation related to a one standard deviation change in the predictor. From the output of the direct and standardized direct effect, I explored the direct effect of each independent variable and mediating factor on the dependent variable. From the indirect and standardized indirect effect, I explored the mediating the effects of High Action, Addiction, and Protection on the relationships between assault-injury and the indicator variables. According to these results, I rejected the null sub-hypothesis.

Research Question 2

Is there a correlation between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race?

Null Hypothesis H_{02}: There is no correlation between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

Alternative hypothesis H_{a2}: There is a correlation between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

For answering the second research question, I did not covariate latent factors but I added reciprocal paths between the categories of High Action, Addiction, and Protection (See Figures B2 and B5). I repeated the SEM test statistic for this adjusted model. From the parameter estimates, I examined the regression coefficients and the direct and indirect effects of the latent factors on each other and on youth-assault injury. The results of such examination allowed me to reject the second null hypothesis.

Treats to Validity

The cross-sectional survey design using secondary data allows examination of the characteristics of a large population from a small number of individuals (Creswell, 2013). My study's sample is a representative sample of adolescents who were enrolled in school during the school year 1994-1995. The Add Health researchers' exclusion of home-schooled students and adolescents who dropped out of school during sampling procedures restricts the study results generalization. Another concern about this study results' generalization is the date of data collection, 1996. The characteristics of adolescents, their behaviors, and the social and economic context of this study's participants might differ from these of their counterpart adolescents now. Response bias is less likely to affect this study results because of the high response rate of 88.6% in Wave II.

In addition to the lack of information about the instrument's convergent, discriminant, and concurrent validity, various factors may have contributed to increasing the probability of inaccuracies of this study's data. The first factor is the likelihood of investigators and respondents' personal bias occurrence during in-person interviews. Add Health researchers used a CASI portion for the sensitive health and risk behavior questions. This approach might have minimized the influence of the interviewer on the adolescent's responses. The second factor is the incomplete development of the cognitive system during adolescence. Adolescents' responses to sensitive questions relate to their level of maturity and their perception of behaviors either as risk or normative. The third factor is the potential recall bias in the data since, except for the questions on illicit drug use, all questions about risk behaviors require a 12-month recall period. The fourth factor is that Add Health Wave II in-home survey was a follow-up of Wave I with the same participants using almost identical questionnaires. In Add Health website and related literature, information is lacking about the testing effects on Wave II responses. In addition to the above factors, social desirability and random measurement error may have influenced data accuracy. Since I am not using other sources of data, it is difficult to determine the extent to which the above factors influenced data accuracy.

Ethical Procedures

After and only after the IRB approval for the study proposal, Walden University policy allows investigators to conduct research. This restriction applies to dealing with secondary data. The IRB approval number for this study is 05-18-15-0265179. The IRB approval assures that researchers' procedures comply with the federal Code of Ethics and the standards of professional conduct to assure maximum protection of human subjects (U.S. Department of Health & Human Services, 2010). The IRB approval of my study proposal was also essential to request the restricted-use dataset from the UNC CPC. To gain access to data, my dissertation Chairperson sent a contractual agreement (Appendix A) to the UNC CPC. The agreement included the investigators' information, an agreement for use of restricted-use data signed by the investigators, supplemental agreements with research staff, and security pledges signed by all persons who used the data. With this agreement, the CPC obliges researchers to incorporate a plan for sensitive data security, a copy of the IRB approval of the sensitive data security plan and the research project, which took into special consideration deductive disclosure risks, and confidentiality certificates for the primary investigator and research staff from the Department of Health and Human Services.

Treatment of Human Participants in Parent Study

The IRB of the UNC School of Public Health approved the Add Health in-home interview procedures. The UNC IRB guidelines are based on the Code of Federal Regulations on the Protection of Human Subjects 45 CFR 46 (Harris, 2009). This Code and its Subpart D obliges researchers to obtain informed consent forms from parents and legal guardians of children, as well as from children who are capable of providing assent (U.S. Department of Health & Human Services, 2010). For each in-home interview, Add Health researchers obtained written informed consent forms from a parent or legal guardian and the adolescent.

The participation in Add Health Waves was voluntary: only after contacting parents or legal guardians, did researchers conduct the in-home interviews with these who agreed to participate. They collected the data using a CAPI, ACASI and a CASI portion for the sensitive health and risk behavior questions. The latter minimized the influence of the interviewer on the adolescent's responses.

Treatment of Human Participants and Data Security in Current Study

From the CD-ROM, I downloaded the anonymous data only one time on a stand-alone desktop computer, which I permanently disconnected from the Internet or any other networks. For the stand-alone desktop computer, I assured physical security of the computer and the data. I kept the computer in a locked room, created a strong password, and activated screen saver at three minutes of inactivity and protected it with a strong password. I enabled encryption for directories containing secure data and configured statistical software to point temporary work files to the encrypted directory. Periodically, I ran a secure erasure program for deleting all temporary files completely from the system. I saved the CD-ROM in a locked safe. After completing the research, I deleted all data and related files from the system and returned the CD-ROM to UNC CPC.

All persons who had access to data were willing to maintain limited access to data. They had confidentiality certificates and certificates of protecting human research participants. No person intended or tried to identify any participant, family, group, or school in the dataset. I used data solely for statistical analysis with no attempt to identify or publish sensitive data on the individual or family level. There was no accidental identification of an individual, family, household, school, and/or geographic area. Except for the persons who signed the agreement, I allowed no other persons to access or use the data. I expressed my willingness to Add Health personnel to accommodate any required inspection of the physical housing and handling of data and related information's files.

There were no conflict of interest or power differentials since I conducted this research on secondary data. Using secondary data reduced the risk, time, and discomfort of participants in the parent study. My aim was to enhance the knowledge about youth assault-injury and I received no financial assistance from any other parties. In general, the present study did not involve greater than minimal risk (45 CFR 46, Subpart D, §46.404; U.S. Department of Health & Human Services, 2010).

Summary

The purpose of the present cross-sectional quantitative study, using a representative sample of American adolescents from secondary data, was to inquire if the construct of Røysamb et al.'s (1997) multidimensional model applies to the examination of the underlying structure of youth assault-injury. This structure included the first-order level variables of physical training, car speeding, weapon carrying and use, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, car driving while intoxicated, risk behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing a seatbelt, religiosity, school performance, and school connectedness. The second-order level included three categories/factors namely, High Action, Addiction, and Protection, while the third-order level included assault-injury and the covariates age, sex, race, and socioeconomic status. The subsequent purpose was to use the multidimensional model to examine the structure and patterns of the relationships among variables at the third-order level and categories at the second-order level and youth assault-injury.

This chapter highlighted the appropriateness of using a cross-sectional survey design and a representative sample of American adolescents from the Add Health in the present study. This design allowed me to answer the study questions and test the hypotheses. This chapter included a comprehensive explanation of the parent study methodology and the present study population, sampling, and instrumentation. In this chapter, I also discussed data cleaning and handling procedures. The study questions, relevant hypotheses, and related data analysis contained discussions of the structural equation model, its assumptions, and interpretation of its results. This chapter also revealed the internal and external threats to the validity of the study. These threats included the data collection year; the lack of information about the instrument's convergent, discriminant, and concurrent validity; the recall bias; the potential interviewers' and respondents' bias; and random measurement error. This chapter pointed out the minimal risk of the present study to participants, and the procedures I followed to protect the study participants' sensitive data. The next chapter contained a detailed explanation and the appropriate discussion of the data analysis results.

Chapter 4: Results

Introduction

My purpose in conducting this cross-sectional quantitative study was to examine if the construct of Røysamb et al.'s (1997) multidimensional model explains the underlying structure of American youth assault-injury. In this study, I compared first-order variables (i.e., physical training, weapon carrying and use, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking, alcohol misuse, car driving while intoxicated, risk behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing a seat belt, religiosity, school performance, and school connectedness) and second-order factors (i.e., High Action, Addiction, and Protection) to the third-order variable of assault-injury, while controlling for age, sex, race, and SES. My subsequent aim was to use the construct of the multidimensional model to examine the structure and patterns of the relationships between variables at the third-order level and categories at the second-order level and youth assault-injury.

To fulfill these aims, I answered two main questions and one subquestion. The first research question asked whether the construct of the multidimensional model explains the youth assault-injury underlying structure among the study's risk and protective variables controlling for age, sex, race, and SES. For answering the first research question, I tested the first null hypothesis H_0: The construct of the multidimensional model does not explain the youth assault-injury underlying structure among the risk and protective variables controlling for age, sex, race, and SES. The first subquestion asked if the construct of the multidimensional model explains the relationships among the study's risk and protective variables and youth assault-injury controlling for age, sex, race, and SES. For this subquestion, I tested the first subhypothesis H_{01}: The construct of the multidimensional model does not explain the relationships among the risk and protective variables and youth assault-injury controlling for age, sex, race, and SES. The second research question asked if a correlation exists between adolescent assault-injury likelihood and patterns of interactions among categories of High Action, Addiction, and Protection when controlling for age, sex, SES, and race. This question called for testing the second null hypothesis H_{02}: There is no correlation between adolescent assault-injury likelihood and patterns of interactions among categories of High Action, Addiction, and Protection when controlling for age, sex, SES, and race.

I begin this chapter with an outline of the parent study's data collection. Next, I note the sample size and provide baseline demographic characteristics of the sample and its population estimates. Then, I explain the development of measures according to data characteristics. Next, I discuss the missing data in the sample and the appropriate approach for handling missing values in the statistical tests. Following that, I report descriptive statistics and discuss the SEM assumptions. Next, I report the SEM results according to the study questions and hypotheses. I end this chapter with a summary of the findings and transition to Chapter 5.

Data Collection

Timeframe for Data Collection and Response Rates

I used the cross-sectional archival data from the Add Health Wave II in-home interview survey. Add Health researchers collected these data between April and August 1996. In this wave, researchers conducted a 90-minute in-home interview with 14,738 participants. Add Health researchers received approval of the in-home interview procedures from the UNC IRB. Then they informed parents via their children (through their schools) and via U.S. mail prior to data collection. For each in-home interview, Add Health researchers obtained written informed consent forms from a parent or legal guardian and from the adolescent (Harris, 2013). The response rate for this wave was 88.6% (Harris, Halpern, Haberstick, & Smolen, 2013).

Obtaining the Add Health Wave II data necessitated the fulfillment of the UNC requirements and procedures. These procedures included assuring data protection against any deductive disclosure by securing a stand-alone computer and providing a signed data use agreement and data security plan to UNC. The timeframe between submitting the documentation to UNC and receiving the data CD-ROM was 45 days. The CD-ROM included Waves I and II, and variables for weighting the data and the codebooks. The UNC personnel provided the appropriate password for opening the data files.

Sample Size and Demographic Characteristics

Wave II did not include race variables. Therefore, in SPSS 21, I merged these variables from the Wave I dataset with the Wave II in-home interview dataset, using the respondent identifier number as the key variable. I used SPSS 21 software to create a subdataset that included my study's variables. I also used SPSS to calculate baseline descriptive statistics. In Chapter 3, I noted my plan to use AMOS SPSS for data analysis. Since this software is incompatible with complex samples and survey data analysis, I used STATA 14 for data handling and LISREL 9.2 for all other statistical procedures.

In the Wave II dataset, there was 7.9% loss of the total sample n = 14,738 because 1,168 of the cases did not have values for the grand sample weight variable GSWGT2 (see Table 1). Chen and Chantala (2014) suggested deletion of cases with missing weight values. They noted that the weighted sample (excluding the cases with missing weight values) projects the sample of adolescents into the study population. Cleaning the data from cases with missing weight values resulted in a sample n=13,570 (See Table 1).

Table 1

Case Processing Summary

	Valid		Cases missing		Total	
	N	Percent	*N*	Percent	*N*	Percent
GRAND SAMPLE WEIGHT - W2	13570	92.1%	1168	7.9%	14738	100.0%

Since some of the risk behaviors become acceptable in older adolescence, I excluded cases of age ≥ 19 year-olds from the subdataset. This exclusion resulted in a sample n = 12,623. This sample is 93% representative of the total sample. It is also a nationally representative sample of 11 to 18 years olds in 1996 who enrolled in Grades 7 to 12 in U.S. schools in the academic year 1994-1995.

The study population estimate. The Add Health longitudinal study's core sample of 12,105 adolescents is a nationally representative sample of adolescents enrolled in

Grades 7 to 12 in U.S. schools in the academic year 1994-1995 (Harris, 2013). The Wave II in-home interview sample included youth who were in Grades 7 to 11 in Wave I, the adolescents in Grade 12 who were in the genetic and adopted samples, and an additional small number of participants who were not in the Wave I core sample. In Wave II, researchers did not interview the disabled and those who were at Grade 12 in Wave I. The UNC provided sample weight variables for each level of analysis. The strata weight variable (REGION), the primary sampling unit (PSU) variable (PSUSCID), and the grand sample weight variable (GSWGT2) allow obtaining unbiased population parameters and standard errors estimates, thus projecting the sample of youth into the study population. Chen and Chantala (2014) noted that the grand sample weight variable "factors in all levels of clustered sampling, corrections for nonresponse, oversampling, and post-stratification" (p. 8).

Following the suggestions of Chen and Chantala (2014), I weighted the dataset using the PSU weight variable (PSUSCID), the strata weight variable (REGION) and the grand sample weight variable (GSWGT2) in LISREL 9.2. According to the recommendation of Harris et al. (2009), I generated a composite variable (Race) from the race variables. Then, I calculated the population estimate. For number of strata = 4, number of observations n = 12,623, design df = 128, and number of PSUs = 132, the population size for this sample is N = 17,654,556. For this sample, the population proportion estimation for males = .4969, females = .5030, Whites = .6589, Hispanics = .1193, African Americans = .1531, Native Americans = .0205, Asians = .0374, and others

= .0103. In the sample population, the proportion of 14-18 year-olds = .9408 (see Table 2).

Table 2

Survey: Population Proportion Estimates

Variable name	Proportion	Linearized Std. Err.	[95% Conf. Interval]	
Bio-sex*				
Male	.4969872	.0058363	.4854428	.5085348
Female	.5030128	.0058363	.4914652	.5145572
Calculated age*				
11	.0006821	.0006087	.0001166	.0039788
12	.0012191	.0008199	.000322	.0046049
13	.0574235	.0064502	.0459151	.0716001
14	.1799304	.0181728	.1467264	.2187222
15	.2033108	.0129605	.1788656	.2301605
16	.2130573	.0109929	.192115	.2356168
17	.1993421	.0146566	.1719152	.2299296
18	.1450346	.0121894	.1225398	.1708548
Race*				
Hispanic	.1193055	.0158832	.091278	.1544761
African American	.1531152	.0201498	.1173422	.1973555
Asian	.0374292	.0073842	.0252661	.0551164
Native Americans	.0205102	.0028098	.0156293	.0268738
Other	.0103483	.0015252	.0077276	.0138454
White	.6589264	.0279568	.6016576	.7119041
Missing	.0003652	.0001659	.0001457	.0009149

Note. * Number of strata = 4, number of observations = 12,623, number of PSUs = 132, population size = 17,654,556, and design *df* = 128

Measures

I created a single race variable from the six variables in Wave I (see Table A2). In the new variable, following Harris et al.’s (2009) suggestions, I gave each respondent a single race category even if she/he marked other races. For instance, if the respondent answered yes to Hispanic, I eliminated this respondent from the other race categories and repeated the procedures. There were 11 cases with missing race values. Except for two cases, for which the interviewer did not provide a valid answer, I replaced the missing race values with the values from the interviewer's observation of the respondent race.

I used the Wave II in-home interview codebooks as guides for recoding the variables. I recoded *refused* and *don't know* as missing values (.) and (.a) respectively. I also re-coded *legitimate skip* as *No* since it indicated that respondent answered '*no*' to previous question(s) related to the current question (i.e., Respondent has never been involved in the risk behavior; Roane & Taylor, 2008). The recoding of the *legitimate skip* was consistent with the answers *No* in all variables except the risky sexual behaviors.

In the measures of risky sexual behavior, the *legitimate skip* in Item H2CO9 included the following: the respondent age < 15 year-olds, never had sexual intercourse, used a condom in most recent intercourse, most recent intercourse was earlier than 12 months, used a condom the first time had sex, and *refused* and *don't know* in all the preceding questions. In Item H2CO10, the *legitimate skip* included the same values, as in Item H2CO9, plus the values *No* in H2CO9. The *legitimate skip* in Item H2CO11 also included respondent age < 15 year-olds, never had sexual intercourse, most recent intercourse was earlier than 12 months, and *refused* and *don't know* in all the former items. In Question H2NR8, the *legitimate skip* included respondents who reported not having sexual relationships with anyone other than one romantic partner. Therefore, I recoded these variables into three categories: 0 for legitimate skip, 1 for never or less than always use of a condom or contraceptives and having multiple partners, and 2 for always using a condom and/or contraceptives and having one partner. I took this recoding into consideration in my interpretation of the statistical analysis results related to risky sexual behavior. Finally, in a departure from the plan I noted in Chapter 3, for religiosity measure, I kept the values sequence in all items, I did not recode the items with ascending values (see Tables A1 and A2 for details about the items). In this study, the variable of SES was average scores for its items. All other scales and composite variables were sum scores of their recoded items.

Various changes in selecting variables were necessary to avoid any reduction in the sample size and/or to enhance the composite variables' internal consistency. These changes included replacing the items that asked about the frequency of various illicit drug use with questions that inquired whether the respondent used the illicit drug. The former variables had a limited number of cases. For instance, out of the 12,623 total cases, there were only 44 valid observations in Question H2TO64 (past month use of needles to inject illicit drugs). I also added Question H2CO9 (i.e., whether the respondent or partner ever used a condom during sexual intercourse in the past 12 months) to the risky sexual behavior composite measure (see Table A2).

I decided to include the two questions about driving drunk and driving while high on drugs in the past year as a separate, not a composite, measures in the statistical analysis (see Table A2). This decision related to the low Cronbach's α = 58.23 of the composite variable of these two items. None of the above changes affected the model’s theory-related substantive meaning and/or the variables' scientific definitions. I calculated the internal consistency reliability (Cronbach's α) for all scale and composite variables. The values of scale reliability coefficient ranged from .6174 for the SES to .9933 for the problem drinking and alcohol misuse measure (see Table 3).

Table 3

The Study's Measures and Their Standardized Cronbach's α

Measure name	Average inter-items correlation	Number of items	Scale reliability coefficient
Assault-injury	.37	5	.7478
Weapon carrying and use	.70	4	.9043
Risky sexual behavior	.39	4	.7247
Delinquency scale	.53	11	.9251
Aggression	.62	2	.7684
Problem drinking and alcohol misuse	.98	3	.9933
Risky behavior while intoxicated	.19	8	.6606
Healthy diet	.09	22	.6946
Religiosity	.83	4	.9533
School performance	.98	4	.9955
School connectedness	.75	4	.9235
Socioeconomic status	.21	6	.6174

Missing Data

I performed the analysis of missing data in two steps using STATA 14. In the first step, I analyzed the data that Add Health reported as missing in the dataset (values = !). The nesting rule of the pattern illustrated that less than 1% of values were missing in four variables. These variables were H2RM4 with one missing, H2JO13 with six, H2CO11 with18, and Race with five missing values. There was a total of 30 missing values in the dataset (see Table 4).

In the second step, I examined the patterns of the missing values in the dataset after re-coding *refused* and *don't know* to missing values (.) and (.a) respectively in all variables. The nesting rule of the pattern illustrated that there were 2.95% missing values in the dataset. It also illustrated that there were a total of 373 missing values in the sample. I explored the pattern of these missing values using the nested pattern of missing values and the nesting rules that describe the pattern (see Appendix F). I created a binary indicator variable (observed value = 0 and missing value =1) for each variable in which the missing values illustrated potential correlation with other variables' missing values. Then, I conducted pairwise correlation analysis for each of the indicator variables with all other variables. The results of the correlation analysis illustrated no large or moderate correlations among the indicator variables of missing values and the other variables; the correlations ranged from (-.04) to (.05). These small correlations support the assumption that data were MAR.

Table 4

Nested Pattern of Missing Values=!

H2RM4	H2CO11	H2JO13	Race
1	0	0	0
			0
		0	0
			0
	1	0	0
			0
		1	0
			1
12,622	18	0	0
			0
		18	0
			18
	12,604	6	0
			6
		12,598	5
			12,593

Note. Number missing listed first

For handling the missing data, I performed FIML, which is available with the SEM in LISREL 9.2. FIML outperforms listwise and pairwise deletion and other data imputation methods such as similar response pattern imputation and ML estimation (Enders & Bandalos, 2001). FIML uses the available information in each case to maximize the case ML function and the overall ML function. Along with SEM statistical test, FIML, automatically, produces the ML solution based on expectation maximization. Accordingly, I ignored the missing data only in the univariate analysis and descriptive statistics and performed FIML with the SEM.

Results

Sample Characteristics

In this study, 16 and 17 year-olds accounted for almost half the sample (46.39%) while 11 to 13 year-olds comprised 4.76% of the sample. In this sample, the distributions of females (51.83%) and males (48.17%) were almost equal. The race distribution reflected oversampling of African Americans (21.37%), Hispanics (16.47%), and Asians (6.79%), and under-sampling of Whites (52.55%), Native Americans (1.84%), and *other* (.94%; see Table 5). The medium SES comprised almost two-thirds (69.39%) while high SES accounted for only 8.47% leaving one-fifth (21.44%) of the sample for low SES (see Table 5).

In this study's sample, 12.9% of the 18-year-olds reported at least one assault-injury in the past year. Among 17-year-olds, 13.3% reported at least one assault-injury in the past year. The percentage among 17-year-olds was the same as among 16-year-olds. The greatest percentage of assault-injury was among 15-year-olds (14.3%), while the lowest percentage of 2.7% was among 12-year-olds (see Table 6).

Table 5

Baseline Descriptive Statistics

Variable name	Frequency	Percent	Cumulative %
Bio-Sex			
Male	6,081	48.17	48.17
Female	6,542	51.83	100
Total	12,623	100	
Calculated age			
11	5	0.0	0.04
12	13	0.10	0.14
13	583	4.62	4.76
14	1,756	13.91	18.67
15	2,149	17.02	35.70
16	2,845	22.54	58.23
17	3,011	23.85	82.09
18	2,261	17.91	100
Total	12,623	100	
Race			
Hispanic	2,079	16.47	16.47
African American	2,697	21.37	37.84
Asian	857	6.79	44.62
Native Americans	232	1.84	46.46
Other	119	.94	47.41
White	6,634	52.55	99.96
Missing	5	.04	100
Total	12,623	100	
Low SES			
0	1,059	8.39	8.39
.2	1,647	13.05	21.44
Medium SES			
.4	3,284	26.02	47.45
.6	2,486	19.69	67.15
.8	2.069	16.93	83.54
1	921	7.30	90.83
High SES			
1.2	882	6.99	97.82
1.4	123	.97	98.80
1.6	49	.39	99.18
1.8	7	.06	99.24
2	8	.06	99.30
Missing	88	.70	100
Total	12,623	100	

Table 6

Assault-Injury Distribution Among Different Age

	Assault-injury							
Age	0	1	2	3	4	5	Missing	Total
11	3	1	0	1	0	0	0	5
12	13	0	0	0	0	0	0	13
13	523	39	11	5	2	0	3	538
14	1,532	157	43	10	4	1	9	1,756
15	1,840	205	60	16	5	3	20	2,149
16	2,466	250	73	24	6	3	23	2,845
17	2,610	253	81	32	7	7	21	3,011
18	1,969	178	57	18	12	3	24	2,261
Total	10,956	1,083	325	106	36	17	100	12,623

In my study's population, a proportion of .06 of males reported at least one assault-injury in the past year. The proportion of females who reported at least one assault-injury in the past year was .03. Of the study's total population, a proportion of, .09 reported at least one assault-injury in the past year (see Table 7).

Table 7

Assault-Injury Proportion among Gender Groups

	Assault-injury							
Biological sex	0	1	2	3	4	5	Missing	Total
Male	.4017	.0615	.0188	.0047	.0023	.0019	.0061	.497
Female	.4647	.0281	.0064	.0018	2.5e-04	0	.0017	.5039
Total	.8663	.0896	.0252	.0066	.0026	.0019	.0078	1

Note. Number of strata = 4. Number of observations = 12,623. Number of PSUs = 132. Population size = 17,654,556. Design df =128

Key: cell proportion. Pearson: Uncorrected *chi2*(6) = 382.8201. Design-based *F*(5.28, 676.00) = 30.9098, *P* = 0.00

The pairwise correlation coefficients results illustrated that, excluding the variable of healthy diet, assault-injury was statistically significantly correlated (p <.01) with all indicator variables. Excluding the variable of using a seat belt, the correlation coefficients between assault-injury and Protection variables were marginal (range from |.03| to |.06| (see Table 8)

Table 8

Pairwise Correlations Coefficients of Assault-Injury and Indicator Variables

Indicator variable	Correlation coefficient with assault-injury
Physical activity/Ph_Activ	.04*
p-value	.00
n	12,523
Weapon carrying and use/weapon	.56*
p-value	.00
n	12,505
Delinquency/delinque	.38*
p-value	.00
n	12,451
Aggression/aggressi	.63*
p-value	.00
n	12,509
Risky sex/riskysex	.15*
p-value	.00
n	12,402
Cigarette smoking/Cigarett	.16*
p-value	.00
n	12,516
Marijuana use/ Marijuan	.20*
p-value	.00
n	12,489
Cocaine use/Cocain	.16*
p-value	.00
n	12,483
Inhalants use/Inhalant	.14*
p-value	.00
n	12,492
Heroin use/Heroin	.16*
p-value	.00
n	12,495
Needle use for drug injection/Needle	.14*
p-value	.00
n	12,499

(*table continues*)

Indicator variable	Correlation coefficient with assault-injury
Alcohol misuse/alcohol	.18*
p-value	.00
n	12,395.
Driving drunk/Drunk_Dr	12*
p-value	.00
n	12,518
Driving high on drugs/Drug_Dr	.14*
p-value	.00
n	12,521
Risk behavior intoxicated/riskbeha	.44*
p-value	.00
n	12,510
Healthy diet/healthyd	-.01**
p-value	.15
n	12,510
Dental hygiene/Dental	-.03*
p-value	.00
n	12,516
Safety equipment use/Equipmen	-.05*
p-value	.00
n	12,523
Wearing a seat belt /Seatbel	-.12*
p-value	.00
n	12,523
Religiosity/Religios	.06*
p-value	.00
n	12,480
School performance/schoolpe	.04*
p-value	.00
n	12,459
School connectedness/schconne	.03*
p-value	.00
n	12,507

Note. * statistically significant coefficient p <.00
* *Nonsignificant correlation: $p > .05$

Statistical Assumptions of SEM

Various assumptions, about the sample and the data, underlie SEM (Kaplan, 2000, Ullman, 2006). Although this study's data violated few assumptions, the statistical software included alternatives that remedy these violations. The first SEM assumption is that the sample size is sufficient for generating unbiased parameter estimates and standard errors. The guidelines suggest a sample size of at least 100 cases for a model with two to four factors or 15 cases for each parameter. The present study sample size n = 12,623 does not violate this assumption.

The second assumption is that observed variables in the data follow univariate and multivariate normal distribution. Ignoring this assumption will result in severe underestimation of parameter estimates and standard errors and overestimation of the χ^2 test statistic, its degree of freedom, and its related goodness of fit (Kaplan, 2000). It is noteworthy that, because four ordinal variables (i.e., delinquency, healthy diet, school performance and school connectedness) had more than 15 categories, LISREL treated these variables as continuous in the data screening statistics. Defining an ordinal or categorical variable as continuous results in biased parameter estimates and standard errors estimates (Byrne, 1998). Therefore, I did not define the ordinal and categorical variables, in my dataset, as continuous.

Moreover, when the sample size is large, the significance tests for univariate and multivariate normality may generate misleading results (Roane & Taylor, 2008). Accordingly, although the delinquency variable showed departure from univariate normality (*M* = 2.62, *SD* = 3.67, skewness = 2.67, and kurtosis = 10.07; see Table 9), I overlooked significance tests for univariate and multivariate normality.

To assure compliance with univariate and multivariate normality assumption, I used Satorra-Bentler (S-B) scaled χ^2 test statistic (Bryant & Satorra, 2012). This function produces robust estimates of the χ^2 goodness of fit test, parameter estimates, and standard errors in large samples when data violate univariate and multivariate normality. S-B scaled χ^2 test statistic is also appropriate when variables are not continuous. In LISREL 9.2, I performed the S-B scaled χ^2 by including the asymptotic covariance matrix as weight matrix along with the ML command in the model setup. S-B scaled χ^2 test statistic is also appropriate when data violate the third assumption of SEM: the independence of factors and errors (Ulman & Bentler, 2004). Therefore, testing the independence of factors and errors in my data, although inapplicable, was not necessary.

Table 9

Univariate Summary Statistics for Continuous Variables

Variable	Mean	St. Dev.	Skewness	Kurtosis	Minimum	Freq.	Maximum	Freq.
AID	*****	*****	-5.90	41.63	*****	1*****	1*****	1
PSUSCID	88.85	67.47	1.39	2.32	1	13	371	62
GSWGT2	1396.23	1258.20	1.42	3.17	18.19	5	8246.08	1
Delinquency	2.62	3.67	2.67	10.07	0	3926	34	1
Healthy diet	3.83	2.88	1.15	2.38	0	1145	22	4
School performance	7.29	3.56	-.10	-2.55	0	869	16	84
School connectedness	8.75	3.75	-.16	.59	0	747	20	37

The fourth assumption is that data are complete for all units of analysis. As I noted earlier, I performed FIML with the SEM test statistics. FIML produces the ML solution based on expectation maximization. The fifth SEM assumption is that independent variables are free from multicollinearity. In my study, the High Action, Addiction, and Protection are latent/unobserved variables. Performing the test of variance inflation factor (VIF) on the injury and the three unobserved variables was inapplicable. LISREL output includes a warning about multicollinearity when it exists in data; the statistical tests results illustrated no multicollinearity in this study's data.

The sixth assumption is that the specification of the model is appropriate. This assumption necessitates selecting variables and paths according to sound theory and scientific knowledge. Specification errors may result from omitting relevant variables and/or paths from the systems of equations in SEM. The specification errors may bias the parameter estimates and influence the power of other parameters' test in the model. In the present study, in addition to the relevant variables and their specific interrelationships in Røysamb et al.'s (1997) empirical model, I selected variables that reflected all the constructs of the behavior system in Jessor's (1987) PBT. (see Figure B3).

Three issues may have had influenced the specification of my study's model. First, neither Jessor nor Røysamb et al. (1997) accounted for demographic characteristics. My inclusion of covariates in the theoretical model violated the assumption of model specification base on theory. Second, there was a the lack of studies in which researchers examined the relationships among several of my study's variables and youth assault-injury. My inclusion of such variables in a particular category lacked sufficient scientific support. Third, I eliminated various variables, which did not apply to American youth assault-injury from Røysamb et al.'s (1997) multidimensional model. To enhance the model specification and eliminate multicollinearity, if any, among latent variables, I used the modification indices to adjust the model.

In conclusion, this study's data violated the assumptions of univariate and multivariate normality, complete data for all units of analysis, and model specification base on theory. I used S-B scaled χ^2 test statistic to remedy the violation of univariate and multivariate normality. I performed FIML to overcome the violation of complete data for all units of analysis. I also adjusted the theoretical model according to the modification indices to improve the model specification.

Statistical Analysis Findings

Research question 1**.** Does the construct of the multidimensional model explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES?

First null hypothesis H_0: The construct of the multidimensional model does not explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES.

Alternative hypothesis H_a: The construct of the multidimensional model does explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES.

The model estimation and test statistics. I specified the SEM in the form of a path diagram of the multidimensional model in LISREL 9.2 graphics (See Figure B3). The SEM translates the relations in the diagram into equations and then estimates the model. Basically, SEM is a concurrent sequence of multiple linear regressions model with one dependent variable (y): $y = i + Xb + e$, where y is observed values on the dependent variable, i is the y-intercept, X is the model's matrix of independent variables, b is the regression weights, and e is disturbance or residual or error unexplained by the model (Fox, 2002). In SEM, the structural model for latent variables η is $\eta = \alpha + \mathrm{B}\eta + \Gamma \mathrm{x} + \zeta$, where α is a vector of intercept, B is the matrix of structural parameters, Γ is regression parameter matrix for regressions of latent variable(s) η on explanatory variable(s) x, and ζ is a vector of disturbance (Muthén, 1984; Ullman, 2006).

I performed the SEM on the sample covariance matrix. This matrix was a (k x k) matrix, in which the diagonal values are the sample variance of the observed variables and the elements below are the estimates of the sample covariance between each pair of the observed variables (see Appendix G). The covariance matrix was *not positive definite*. In this case, LISREL 9.2 took ridge option with ridge constant = 1.00 for all test statistics.

I included the asymptotic covariance matrix in LISREL commands to execute S-B scaled ML χ^2 test statistic. "Because a latent variable is unmeasured, its units of measurement must be fixed by the researcher. This condition concerns how the units of measurement of each latent variable are fixed. Each construct must have ... one fixed nonzero loading (usually 1.0)," (Kenny, 2012, para. 2). Therefore, I fixed the paths between High Action and weapon carrying and use, Addiction and cigarette smoking, and Protection and healthy diet to 1.00. I also set the test significance level to p = .01in SIMPLIS commands.

The model evaluation. For the theoretical model, the scaled ML χ^2 test statistic of absolute model fit was χ^2 (304, n = 12,623) = 16093.217, p = .00. This statistically significant χ^2 indicates that the model is not consistent with the data. SEM best practices guidelines suggest adding further constrains to the model to improve the χ^2 estimate. These constraints should be based on former studies results. Studies in which researchers used similar approach to examine assault-injury were missing in the literature I reviewed. Therefore, I did not add constraints to the model, but I used the fit indexes, not χ^2 estimate, to evaluate the model fit. Supporting my evaluation of the model according to the fit indexes values is that χ^2 calculation is based on the sample size; a large sample size produces an inflated chi-square. This χ^2 test is $(N - 1)\ F_{\min}$, where N is the sample size and $F_{\min}$ is the value of the function minimum of F, which is

> $F = (s - \sigma\ (\Theta))W(s - \sigma\ (\Theta))$, where s is the vector of... the observed sample covariance matrix, σ is... the vector of the estimated population covariance matrix..., and (Θ) indicates that σ is derived from the parameters (the regression coefficients, variances and covariances) of the model. W is the matrix that weights the squared differences between the sample and estimated population covariance matrix (Ullman, 2006, p.42).

Therefore, to be able to draw a conclusion about the model adequacy, I examined the RMSEA, the standardized root mean square residual (SRMR), and the comparative fit index (CFI). The latter two indexes are less sensitive to sample size. The guidelines for RMSEA estimation suggest values $\leq .05$ for close approximate fit, values between .05 and .08 for a reasonable error of approximation, and values $\geq .10$ for poor fit of a model. For the theoretical model, the values of RMSEA and *p*-value for test of close fit (RMSEA < 0.05) were RMSEA = .064, 90% CI [.063, .065] and *p* of close fit = 1.00. For the *p*-value for test of close fit (RMSEA < 0.05), Kenny (2014) noted that the null hypothesis for this measure is that RMSEA = .05 and "The alternative, one-sided hypothesis is that the RMSEA is greater than 0.05. So if the *p* is greater than .05 (i.e., not statistically significant), then it is concluded that the fit of the model is "close." If the p is less than .05, it is concluded that the model’s fit is worse than close fitting (i.e., when the RMSEA is greater than 0.05" (para. 5).

The value of RMSEA indicated close fit and illustrated (1) evidence that the construct of the theoretical model explains the underlying structure of youth assault-injury among the indicator variables while controlling for demographic variables; and (2) evidence that some of the variables and factors are significant indicators of youth assault-injury. The RMSEA value also indicated that the sample size inflated the χ^2 test.

For the theoretical model, the SRMR was .071, which illustrated good fit, as SRMR $\leq .10$ indicates good fit and a value of zero indicates a perfect match between the model and the data. For the hypothetical model, the CFI was .67. The rule of thumb for a good fit is that CFI $\geq .90$ and the value of one indicates perfect fit (Ullman, 2006). It is noteworthy that the complexity of a model influences the CFI since this index pays a penalty of one for each parameter in the model (Kenny, 2014). The value of CFI = .67 contradicted the values of RMSEA and SRMR that indicated close fit of the model. In Appendix I, I reported a complete list of the hypothetical model goodness-of-fit statistics.

The CFI = .67 indicated poor fit since CFI should be ≥ 90 for a model with good fit, while the values of RMSEA = .64, *p* of close fit =1.00, and SRMR = .07, indicated close or good fit of the model (there is a lack of consensus in regards to cut-off values of fit indexes). The conflicting evidence of fit indexes results necessitated further examinations of the model's statistical test results. The squared multiple correlations for reduced form, in SEM, illustrate the variance in the latent factor accounted for by the indicator variables. These correlations indicated that the predictor variables explained 43% of the High Action variance ($R^2 = .43$, $p = .01$), 13% of the Addiction variance ($R^2 = .13$, $p = .01$), and 47% of the Protection variance ($R^2 = .47$, $p = .01$; see Table 10).

Table 10

Squared Multiple Correlations for Reduced Form

Factor/Variable	R^2
High action	.43
Addiction	.13
Protection	.47

Note. The values in the table are the relative variance of the latent factors that were explained by indicator variables.

In SEM, the ML parameter estimates are parallel to the linear regression coefficients. Their significance relate to the *t*-values and *p*-values. For a coefficient to be statistically significantly nonzero, its *t*-value, of the ML estimates, is supposed to exceed the critical value 2.58 for p =.01, two tailed, and sample size >1000 (San José State University, 2015).

In Table 11, I reported the ML structural equations that illustrated statistically significant path coefficients between assault-injury and High Action (z = 45.419, *SEM* = .276, $p < .01$, two-tailed), Addiction (z = 12.674, *SEM* = .011, $p \leq .01$, two-tailed), and Protection (z = 3.068, *SEM* = .114, $p \leq .01$, two-tailed). In the structural equations, each effects/structural path coefficient indicate the magnitude of change in assault-injury that was predicted to accompany a unite change in the relevant latent factor. Each of these effects/structural coefficient was calculated with all other variables and paths in the model left unchanged at their original values.

Table 11

Structural Equations of Latent Factors and Variables

High Action = - 0.0905*SEX - 0.00301*AGE - 0.0193*ses - 0.0254*Race + **0.276***Injury**, Errorvar.= 0.596,

	SEX	AGE	ses	Race	Injury	Errorvar.
Standerr	(0.00770)	(0.00267)	(0.00450)	(0.00496)	**(0.00608)**	(0.0256)
Z-values	-11.742	-1.125	-4.301	-5.110	**45.419**	23.258
P-values	0.000	0.261	0.000	0.000	**0.000**	0.000

$R^2 = 0.433$

Addiction = - 0.0474*SEX + 0.0374*AGE + 0.00382*ses + 0.0500*Race + **0.110***Injury**, Errorvar.= 0.674,

	SEX	AGE	ses	Race	Injury	Errorvar.
Standerr	(0.00604)	(0.00220)	(0.00352)	(0.00395)		(0.0266)
Z-values	-7.838	17.007	1.086	12.674		25.353
P-values	0.000	0.000	0.277	0.000		0.000

$R^2 = 0.132$

Protection = - 0.496* SEX - 0.133*AGE - 0.0189*ses - 0.00462*Race + **0.114***Injury**, Errorvar.= 0.976 ,

	SEX	AGE	ses	Race	Injury	Errorvar.
Standerr	(0.152)	(0.0409)	(0.0126)	(0.0125)	**(0.0372)**	(0.606)
Z-values	-3.269	-3.249	-1.497	-0.370	**3.068**	1.612
P-values	0.001	0.001	0.134	0.711	**0.002**	0.107

$R^2 = 0.473$

Note. R^2 for Structural Equations are Hayduk's (2006) Blocked-Error R^2
* LISREL term to link the effects/structural coefficient value with the relevant observed variable. Each effects/structural coefficient is calculated when all other things in the model left unchanged at their original values
** The path is statistically significantly nonzero at p<.01

In SEM there are two levels of equations/relationships: (1) the measurement level, also called measurement model (the indicator variables relationships with the unobserved latent factors: High Action, Addiction, and Protection) and; (2) the structural level, also called structural model, which includes relationships between latent variables and factors. In my model, the structural level contained the assault-injury, the unobserved latent factors, and the covariates. The measurement model encompassed the 22 indicator variables and the three latent factors (High Action, Addiction, and Protection).

The above table explained the structural equations/relationships between the latent variables. The *p*-values indicated significant nonzero paths between assault-injury and all the three factors. The R-squared in the structural equations cannot be interpreted, only the R-square from reduced form indicates the relative variance of each factor that the model explains (Jöreskog, 1999). Each effects/structural coefficient indicated the magnitude of change in assault-injury that was predicted to accompany a unite change in the relevant latent factor. Each of these effects/structural coefficients was calculated with all other things in the model left unchanged at their original values.

I reported LISREL unstandardized estimates of the ML (i.e., linear relationships) between indicator variables and latent factors (i.e., at the measurement level) in Table 14. I also noted the unstandardized estimates of the ML (i.e., linear relationships) between assault-injury and latent factors (i.e., at the structural level) in Table 15. From the ML results, except the variables of dental hygiene (Dental) and religiosity (Religios), all unstandardized parameter estimates of the linear relationships among assault-injury (Injury) and latent factors and among observed variables and latent factors were statistically significant nonzero ($t \pm 2.58$, $p \leq .01$, two-tailed).

According to the ML results, all indicator variables, excluding dental hygiene and religiosity, were statistically significantly correlated with the relevant factors; at the same time, all factors were statistically significantly correlated with assault-injury. In SEM, the standard errors of estimates are the standard deviations of the coefficients. For the theoretical model, the standard errors related to the statistically significant parameter estimates were acceptable, they ranged from (.014) to (.582). This range indicated good precision of the coefficients calculations (Princeton University, 2007; see Tables 12 and 13).

Table 12

LISREL Estimates (Maximum Likelihood)

LAMBDA-Y/Linear Relationships among Observed and Unobserved Variables			
	Addiction	High Action	Protection
Physical activity/Ph_Activ	- -	-0.097*	0.465*
Standard error		(0.026)	(0.143)
t-value		-3.745	3.253
Weapon carrying and use/weapon	- -	1.620**	- -
Standard error			
t-value			
Delinquency/delinque	- -	1.802*	- -
Standard error		(0.062)	
t-value		29.285	
Aggression/aggressi	- -	1.523*	- -
Standard error		(0.037)	
t-value		40.857	
Risky sex/riskysex	- -	1.208*	- -
Standard error		(0.065)	
t-value		18.554	
Cigarette smoking/Cigarett	0.660**	- -	- -
Standard error			
t-value			
Marijuana use/ Marijuan	0.957*	- -	- -
Standard error	(0.022)		
t-value	43.791		
Cocaine use/Cocain	0.878*	- -	- -
Standard error	(0.021)		
t-value	41.769		
Inhalants use/Inhalant	0.616*	- -	- -
Standard error	(0.019)		
t-value	33.114		
Heroin use/Heroin	0.949*	- -	- -
Standard error	(0.022)		
t-value	43.594		
Needle use for drug injection/Needle	0.716*	- -	- -
Standard error	(0.019)		
t-value	40.687		
Alcohol misuse/alcohol	4.425*	- -	- -
Standard error	(0.109)		
t-value	40.687		

(*table continues*)

	Addiction	High Action	Protection
Driving drunk/Drunk_Dr	0.815*	- -	- -
Standard error	(0.020)		
t-value	39.980		
Driving high on drugs/Drug_Dr	0.959*	- -	- -
Standard error	(0.022)		
t-value	43.840		
Risk behavior intoxicated/riskbeha	2.453*	- -	- -
Standard error	(0.059)		
t-value	41.820		
Healthy diet/healthyd	- -	- -	0.120**
Standard error			
t-value			
Dental hygiene/Dental	- -	- -	-0.015***
Standard error			(0.014)
t-value			-1.142
Safety equipment use/Equipmen	- -	- -	-1.873*
Standard error			(0.582)
t-value			-3.218
Wearing a seat belt /Seatbel	- -	- -	-0.297*
Standard error			(0.093)
t-value			-3.191
Religiosity/Religios	- -	- -	0.063***
Standard error			(0.040)
t-value			1.570
School performance/schoolpe	- -	- -	0.742*
Standard error			(0.230)
t-value			3.222
School connectedness/schconne	- -	- -	0.197*
Standard error			(0.077)
t-value			2.576

Note. * The parameter estimate (path coefficient) is statistically significantly nonzero ($t > \pm 2.58$, $p \leq .01$, two-tailed)
** Fixed path with $p<.01$. The significance level was obtained from the measurement equations (not reported)
*** Statistically nonsignificant path with p>.05 no evidence that the path is nonzero

The values in the table above included the path coefficient/loading/ parameter estimate of each of the indicator variables and the relative latent factor. They also included the standard error (the standard deviation of the relative coefficient) and the *t*-value that is supposed to exceed the critical value of 2.58 for the path to be statistically significantly nonzero. Nonzero coefficient means that the indicator variable is statistically significantly correlated (significant predictor) to the relevant factor.

Table 13

LISREL Estimates (ML)

GAMMA/ Linear Relationships among the Component Variable and Latent Factors	
	injury
Addiction	0.110*
Standard error	
t-value	
High Action	0.276*
Standard error	(0.006)
t-value	3.068
Protection	0.114*
Standard error	(0.037)
t-value	45.419

*Note.** The parameter estimate (path coefficient) is statistically significant nonzero ($t > \pm 2.58$, $p \leq .01$, two-tailed)
** Fixed path with $p<.01$. The significance level was obtained from the measurement equations (not reported)

The values in the table above included the path coefficient/ parameter estimate of each of the latent factor and assault-injury. They also included the standard error (the standard deviation of the relative coefficient) and the *t*-value that is supposed to exceed the critical value of 2.58 for the path to be statistically significantly nonzero. Nonzero coefficient means that the latent factor is statistically significantly correlated (significant predictor) to assault-injury.

In addition to the conflicting evidence of fit indexes and the statistically significant parameter estimates, three issues necessitated my exploration of the misfit in the model components. The first issue was the lack of research into the relationships among delinquency, risky sexual behavior, various illicit drug uses (except marijuana use) and youth assault-injury. The second issue was the lack of theoretical explanation, in the problem behavior theory, about the relationships among physical activity, dental hygiene, healthy diet, using safety equipment, and wearing a seatbelt, and problem behaviors (including youth assault-injury). The third issue was the potential differences between the population of Røysamb et al.'s (1997) study (Norwegian adolescents) and the population of the present study (American adolescents). These three issues may have resulted in a potential misspecification of the factors and intercepts. Therefore, according to the modification indices and the standardized solution results, I added paths that influenced chi-square test statistic, but did not affect the model's theory-related substantive meaning.

For the modified model, according to the modification indices of the theoretical model results, I added paths from Addiction to delinquency, risky sexual behavior, and religiosity. I also added paths from High Action to risk behavior while intoxicated and wearing a seat belt. I deleted the path from High Action to the physical activity variable, since the maximum likelihood results illustrated marginal value of this path ($\lambda_{High\ Action\ physical\ activity} = -0.097$, $p<.01$) compared to the value of the path between physical activity and Protection ($\lambda_{Protection\ physical\ activity} = .465$, $p<.01$).

Also in the modified model, I added error covariance between school performance and school connectedness, needle use for injecting illegal drugs and alcohol misuse, cocaine, inhalants, and heroin use, and between cocaine and inhalants and heroin use. I also co-varied the errors of heroin and inhalants use, and the errors of driving drunk and alcohol misuse, heroin use, and driving while high on drugs. I co-varied the errors of driving while high on drugs and marijuana use and the errors of the covariate sex and needle use for injecting illegal drugs. I set the error covariance of High Action and Addiction free. Then I repeated the S-B scaled ML χ^2 test statistic on the modified model, using a significance level of $p = .01$. "Because a latent variable is unmeasured, its units of measurement must be fixed by the researcher. This condition concerns how the units of measurement of each latent variable are fixed. Each construct must have either... one fixed nonzero loading (usually 1.0)" (Kenny, 2012, para. 2). Therefore, I fixed the paths between Protection and physical activity, High Action and weapon carrying and use, and Addiction and cigarette smoking to 1.00 (see Figure 4).

For the modified model, the scaled ML χ^2 test statistic of absolute model fit was χ^2 (286, n = 12,623) = 5570.776, p =.00 and the fit indexes were RMSEA = .038, 90% CI [.037, .039], p of close fit = 1.00, SRMR = .044, and CFI = .89. The values of RMSEA, p of close fit, SRMR, and CFI suggested that the model is adequate and allowed rejecting the first null hypothesis and accepting the first alternative hypothesis. I reported a complete list of goodness-of-fit statistics for the modified model in Appendix J. To assure that my decision of rejecting the first null hypothesis was adequate, I further examined the fitted residuals of the model.

In LISREL, the fitted residuals illustrate the difference between the sample covariance and the tested model's covariance matrixes. I explored the fitted residuals, not the standardized residuals, for examining misfit in the model for two reasons. First, in LISREL, the calculation of standardized residuals is based on the normality assumption. My study's variables violation of the assumption of multivariate normality may have biased the standardized residuals. Second, LISREL results of observed standardized residuals are not precise and may result from rather an arbitrary scaling of the observed variables' residuals (Jöreskog, Sörbom, & Yang-Wallentin, 2006).

There were five large fitted residuals in the fitted residuals matrix. These fitted residuals were (2.546) and (2.415) for the covariance of risky sexual behavior and age and safety equipment use respectively, (2.237) for the covariance of weapon carrying and use and alcohol misuse, (2.062) for the covariance of aggression and alcohol misuse, and (-1.918) for the covariance of delinquency and safety equipment use. Diamantopoulos and Siguaw (2000) suggested that fitted residuals should be small in contrast to the magnitude of covariance matrix's elements. The fitted residuals of the former variables were small in comparison to the values of elements in the covariance matrix (see Appendixes E and F).

I also examined whether the variables of risky sexual behavior, safety equipment use, alcohol misuse, aggression, weapon carrying and use, and delinquency measured similar behaviors and the results were negative; each of these variables measured a different behavior. The alcohol misuse variable had negative fitted residuals with itself (-.01), but did not have multiple large fitted residuals with other variables. The variables of risky sexual behavior, safety equipment use, aggression, weapon carrying and use, and delinquency did not have negative fitted residuals with themselves (i.e., the fitted residual of weapon carrying and use with itself = .00, delinquency = .36, aggression = .00, risky sexual behavior = .15, and safety equipment use = .00). Nor they had fitted residuals with other variables. Therefore, the fitted residuals examination results in addition to the model SRMR = .04 did not suggest potential misfit in the model.

In summary, the values of RMSEA, SRMR, and CFI and the fitted residuals examination results illustrated no potential misfit in the model. These values allowed rejecting the first null hypothesis and accepting the first alternative hypothesis H_a: the construct of the multidimensional model does explain the youth assault-injury underlying structure among variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness controlling for age, sex, race, and SES. I provided further evidence that supported the rejection of the first null hypothesis and acceptance of the first alternative hypothesis in the following section, which entailed testing the first sub-hypothesis.

Research Subquestion 1

Does the construct of the multidimensional model explain the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, church attendance, and school performance, and the latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES?

First subnull hypothesis H_{01}: The construct of the multidimensional model does not explain the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and the latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES.

Alternative first subhypothesis H_{a1}: The construct of the multidimensional model explains the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and the latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES.

The parameter estimates. LISREL unstandardized ML estimates (i.e., path coefficients) of indicator variables and latent factors illustrated that only the path between Protection and dental hygiene was not statistically significant ($\lambda_{dental\ hygiene}$ = -.007, *SE* = .0028, *t* (12621) = -.237, *p* = .813). Thus, this path was not statistically significant nonzero (see Table 16). All the other indicator variables were statistically significant predictors of the relevant latent factors; they had statistically significant nonzero values (*t* (12621) ±2.58, $p \leq .01$, two-tailed).

For instance, a 2.04 units increase in Addiction was statistically significantly correlated to a one unit increase in the adolescent's report of engagement in delinquent behavior(s) in the last year ($\lambda_{delinquency}$ = 2.041, *SE* = .081, *t* (12621) = 25.067, *p* <.01). Simultaneously, a .71 unit increase in High Action was statistically significantly correlated to a one unit increase in the adolescent's report of engagement in delinquent behavior(s) in the last year ($\lambda_{delinquency}$ = .711, *SE* = .035, *t* (12621) = 20.317, *p* <.01). A .94 unit increase in High Action was statistically significantly correlated to a one unit increase in the adolescent's report of engagement in aggression behavior(s) in the last year ($\lambda_{aggression}$ = .942, *SE* = .023, *t* (12621) = 41.213, *p* <.01). A 1.23 units increase in Addiction was statistically significantly correlated to the adolescent's report of marijuana use in the last year ($\lambda_{marijuana}$ = 1.226, *SE* = .028, *t* (12621) = 43.290, *p* <.01); at the same time, a 5.87 units increase in Addiction was statistically significantly correlated to a one unit increase in the adolescent's report of engagement in alcohol misuse and/or problem drinking behavior(s) in the last year ($\lambda_{alcohol\ misuse}$ = 5.872, *SE* =.142, *t* (12621) = 41.266, *p* <.01).

An increase of .33 unit in Protection was statistically significantly correlated with a one unit increase in the adolescent's report of consuming extra healthy food items in the last day ($\lambda_{healthy\ diet}$ = .334, *SE* = .083, *t* (12621) = 4.049, *p* <.01) and a 1.75 units increase in Protection was statistically significantly correlated with a one unit increase in the adolescent's report of lower grade scores levels in the past year ($\lambda_{school\ performance}$ = 1.753, *SE* =.120, *t* (12621) = 14.651, *p* <.01). Each path in the maximum likelihood results was calculated when all other things in the model being unchanged (see Table 14).

Table 14

LISREL Estimates (ML)

LAMBDA-Y/Linear Relationships among Observed and Unobserved Variables			
	Addiction	High Action	Protection
Physical activity/Ph_Activ	- -	--	1.000**
Standard error			
t-value			
Weapon carrying and use/weapon	- -	1.000**	- -
Standard error			
t-value			
Delinquency/delinque	2.041*	0.711*	- -
Standard error	(0.081)	(0.035)	
t-value	25.067	20.317	
Aggression/aggressi	- -	0.942*	- -
Standard error		(0.023)	
t-value		41.213	
Risky sex/riskysex	2.801*	0.218*	- -
Standard error	(0.098)	(0.038)	
t-value	28.640	5.726	
Cigarette smoking/Cigarett	1.000**	- -	- -
Standard error			
t-value			
Marijuana use/ Marijuan	1.226*	- -	- -
Standard error	(0.028)		
t-value	43.290		
Cocaine use/Cocain	1.018*	- -	- -
Standard error	(0.026)		
t-value	38.832		
Inhalants use/Inhalant	0.632*	- -	- -
Standard error	(0.023)		
t-value	27.239		
Heroin use/Heroin	1.153*	- -	- -
Standard error	(0.028)		
t-value	41.699		
Needle use for drug injection/Needle	0.726*	- -	- -
Standard error	(0.024)		
t-value	30.200		
Alcohol misuse/alcohol	5.872*	- -	- -
Standard error	(0.142)		
t-value	41.266		

(*table continues*)

	Addiction	High Action	Protection
Driving drunk/Drunk_Dr	5.872*	- -	- -
Standard error	(0.142)		
t-value	41.266		
Driving high on drugs/Drug_Dr	1.001*	- -	- -
Standard error	(0.027)		
t-value	37.684		
Risk behavior intoxicated/riskbeha	1.185*	0.720*	- -
Standard error	(0.028)	(0.026)	
t-value	42.142	27.910	
Healthy diet/healthyd	2.560*	- -	0.334*
Standard error	(0.068)		(0.083)
t-value	37.812		4.049
Dental hygiene/Dental	- -	- -	-0.007***
Standard error			(0.028)
t-value			-0.237
Safety equipment use/Equipmen	- -	- -	-4.373*
Standard error			(0.308)
t-value			-14.209
Wearing a seat belt /Seatbel	- -	-0.254*	-0.490*
Standard error		(0.017)	(0.054)
t-value		-14.729	-9.024
Religiosity/Religios	1.193*	- -	0.335*
Standard error	(0.059)		(0.078)
t-value	20.113		4.282
School performance/schoolpe	- -	- -	1.753*
Standard error			(0.120)
t-value			14.651
School connectedness/schconne	- -	- -	0.301*
Standard error			(0.107)
t-value			2.804

Note. * The parameter estimate (path coefficient/loading) is statistically significantly non-zero ($t > \pm 2.58$, $p \leq .01$, two-tailed)

** Fixed path with $p<.01$. The significance level was obtained from the measurement equations (not reported)

*** Statistically nonsignificant path, $p = .813$. No evidence that the path is nonzero

The values in the table above included the parameter estimate/ path coefficient between each of the indicator variables and the relative factor. They also included the standard error (the standard deviation of the relative coefficient) and the *t*-value that is supposed to exceed the critical value of 2.58 for the path to be statistically significantly nonzero. Nonzero coefficient means that the indicator variable is statistically significantly correlated (significant predictor) to the relevant factor.

I reported LISREL unstandardized estimates of the ML for assault-injury and latent factors (i.e., High Action, Addiction, and Protection) in Table 15. From the ML results, the factors High Action, Addiction, and Protection were statistically significant predictors of assault-injury; all structural paths of the modified model were statistically significant nonzero.

As an illustration, an increase of .45 units of the adolescent's report of assault-injury incidence in the past year was correlated to a one unit increase in High Action ($\gamma_{injury\ High\ Action}$ = .445, *SE* = .010, *t* (12621) = 45.440, *p* <.01, two-tailed). A .10 unit increase of the adolescent's report of assault-injury incidence in the past year was correlated to a one unit increase in Addiction ($\gamma_{injury\ Addiction}$ = .097, *SE* =.003, *t* (12621) = 28.340, *p* <.01, two-tailed); at the same time, a .02 unit increase of the adolescent's report of assault-injury incidence in the past year was correlated to a one unit increase in Protection ($\gamma_{injury\ Protection}$ = .024, *SE* = .005, *t* (12621) = 4.385, *p* <.01, two-tailed). Each path in the maximum likelihood results was calculated when all other things in the model being unchanged.

The standard errors related to the ML estimates were acceptable; they indicated good precision of the coefficients calculations. The standard errors values ranged from (.003) to (.098) and were smaller than the relevant coefficients (except the variables of dental hygiene), thus resulted in statistically significant nonzero coefficients ($t \pm 2.58$, $p \leq .01$, two-tailed; Princeton University, 2007; see Tables 14 and 15).

Table 15

LISREL Estimates (NL)

GAMMA/ Linear Relationships among Latent component and Factors	
	Assault-injury
Addiction	0.097*
Standard error	(0.003)
t-value	28.340
High Action	0.445*
Standard error	(0.010)
t-value	45.440
Protection	0.024*
Standard error	(0.005)
t-value	4.385

Note. * The parameter estimate (path coefficient/loading) is statistically significant nonzero ($t \pm 2.58$, $p \leq .01$, two-tailed)

The values in the table above included the parameter estimate/ path coefficient between each of the latent factors and assault-injury. They also included the standard error (the standard deviation of the relative coefficient) and the *t*-value that is supposed to exceed the critical value of 2.58 for the path to be statistically significantly nonzero. Nonzero coefficient means that the latent factor is statistically significantly correlated (significant predictor) to assault-injury.

The difference between the above table (i.e., Table 15) and Table 14 is that Table 15 included the linear relationships between the components of the structural model (latent factors and assault-injury), while table 14 included the linear relationships among the indicator variables and latent factors.

The structural equations in Table 16 illustrated that the model explained relative variance R^2 = .407 of the High Action, R^2 = .153 of the Addiction, and R^2 = .485 of the Protection factors. The LISREL results of squared multiple correlations for reduced form indicated similar results: the related indicator variables explained 41% of the High Action, 15% of the Addiction, and 49% of the Protection variance. LISREL does not calculate the squared multiple correlation of exogenous observed variables that was assault-injury in this study.

Table 16

Structural Equations for Latent Factors

Protection = - 0.215* SEX - 0.0628*AGE - 0.00561*ses + 0.00229*Race + **0.0238***Injury**, Errorvar.= 0.161,

Standerr	(0.00942)	(0.00346)	(0.00509)	(0.00561)	**(0.00543)**	(0.0293)
Z-values	-22.859	-18.172	-1.103	0.408	**4.385**	5.494
P-values	0.000	0.000	0.270	0.683	**0.000**	0.000

R^2 = 0.485

Addiction = - 0.00263* SEX + 0.0360* AGE + 0.00230* ses + 0.0446*Race + **0.0974***Injury**, Errorvar.= 0.416,

Standerr	(0.00469)	(0.00181)	(0.00284)	(0.00323)	**(0.00344)**	(0.0160)
Z-values	-0.560	19.919	0.811	13.819	**28.340**	25.949
P-values	0.576	0.000	0.417	0.000	**0.000**	0.000

R^2 = 0.153

High Action = - 0.106* SEX - 0.0185*AGE - 0.0364*ses - 0.0554*Race + **0.445***Injury**, Errorvar.= 1.673 ,

Standerr	(0.0106)	(0.00439)	(0.00733)	(0.00811)	**(0.00980)**	(0.0692)
Z-values	-10.022	-4.226	-4.968	-6.829	**45.440**	24.164
P-values	0.000	0.000	0.000	0.000	**0.000**	0.000

R^2 = 0.407

Note. R^2 for Structural Equations are Hayduk's (2006) Blocked-Error R^2

* LISREL term to link the path coefficient value to the relevant observed variable. Each effects/structural path coefficient indicates the magnitude of change in the latent factor that was predicted to accompany a unite change in the relevant observed variable (I highlighted assault-injury in the table). Each of these effects/structural coefficient is calculated when all other variables and paths in the model left unchanged at their original values.

** The path is statistically significantly nonzero at p<.01

In SEM there are two levels: (1) the measurement level, also called measurement model (the indicator variables relationships with the latent unobserved factors: High Action, Addiction, and Protection) and; (2) the structural level (i.e., structural model) that includes relationships between latent variables. In my model, the structural level contained the assault-injury, the unobserved latent factors, and the covariates.

The above table explained the structural equations/relationships between the latent variables. The *p*-values indicated significant nonzero path between assault-injury and all latent factors. The R-squared in the structural equations cannot be interpreted, only the R-square from reduced form indicates the relative variance of each factor that the model explains (Jöreskog, 1999). Each effects/structural coefficient indicated the magnitude of change in assault-injury that was predicted to accompany a unit change in the relevant latent factor (I highlighted assault-injury in the table). Each of these effects/structural path coefficients was calculated when all other things in the model left unchanged at their original values.

In this study's dataset, observed variables had different measurement levels (e.g., scales, ordinal, and categorical), thus their means and variance were meaningless. Therefore, the interpretation of the completely standardized estimates was rather irrelevant. However, I reported the completely standardized estimates, in Tables 17 and 18, to support the model adequacy. The completely standardized estimates (standardized path coefficients) indicated that the solution is acceptable since none of their absolute values exceeded unity.

In the completely standardized solution in table 17, the values of the standardized path coefficients illustrated that all observed endogenous variables, excluding dental hygiene, were statistically significant predictors of the related factors and all latent factors were significant predictors of assault-injury. The latent factor High Action was negatively correlated with wearing a seat belt and positively correlated with its other predictors. In the same solution, Addiction was highly and positively correlated with all its predictors. The Protection factor had negative correlations with safety equipment use (β = -.178, p<.01), and wearing a seat belt (β = -.110, p<.01), and positive correlations with the other predictors (see Table 19).

Table 17

Completely Standardized Solution

LAMBDA-Y/Linear Relationships among Observed and Unobserved Variables			
	Addiction	High Action	Protection
Physical activity/Ph_Active	- -	- -	0.292*
Weapon carrying and use/weapon	- -	0.582*	- -
Delinquency/delinque	0.277*	0.231*	- -
Aggression/aggressi	- -	0.618*	- -
Risky sex/riskysex	0.333	0.062*	- -
Cigarette smoking/Cigarett	0.496*	- -	- -
Marijuana use/ Marijuan	0.608*	- -	- -
Cocaine use/Cocain	0.505*	- -	- -
Inhalants use/Inhalant	0.313*	- -	- -
Heroin use/Heroin	0.572*	- -	- -
Needle use for drug injection/Needle	0.357*	- -	- -
Alcohol misuse/alcohol	0.552*	- -	- -
Driving drunk/Drunk_Dr	0.496*	- -	- -
Driving high on drugs/Drug_Dr	0.587*	- -	- -
Risk behavior intoxicated/riskbeha	0.462*	0.311*	- -
Healthy diet/healthyd	- -	- -	0.046*
Dental hygiene/Dental	- -	- -	-0.003**
Safety equipment use/Equipmen	- -	- -	-0.187*
Wearing a seat belt /Seatbel	- -	-0.172*	-0.110*
Religiosity/Religios	0.214*	- -	0.048*
School performance/schoolpe	- -	- -	0.195*
School connectedness/schconne	- -	- -	0.032*

Note. All variables in the model are standardized.
* Statistically significant standardized path coefficient at significance level p = .01
** Statistically nonsignificant value, t is smaller than the critical value 2.58

The values in the above table are the parameter estimates/ loading/ path coefficients between the indicator variables and relevant factors, but they are standardized. The completely standardized solution illustrates changes in each latent factor that are correlated to a one standard deviation change in each indicator variables when all other variables and factors in the model being unchanged. Since the observed variables have different measurements (scales, ordinary, and dichotomous), which make their means and variance meaningless, the interpretation of the results in the above table is rather irrelevant.

The values of the standardized paths coefficients between assault-injury and the latent factors in Table 18 indicated statistically significant positive correlations between assault-injury and the three latent factors. The completely standardized estimates (i.e., standardized path coefficients) of structural relationships further indicated that the solution is acceptable since none of their absolute values exceeded unity.

Table 18

Completely Standardized Solution

GAMMA/Linear Relationships among the Latent Factors and the Component Variable	
	injury
Protection	0.097*
Addiction	0.318*
High Action	0.607*

Note. All variables in the model are standardized.
* Statistically significant standardized path coefficient at significance level p<.01

The values in the above table are the parameter estimates/ path coefficients between the latent factors and assault-injury, but they are standardized. The completely standardized solution illustrates changes (in standard deviation units) in assault-injury that are correlated to one standard deviation change in each latent factor. This completely standardized solution was necessary to support model adequacy.

I supplied the standardized correlation matrix of assault-injury and latent factors in Table 19. This matrix illustrated statistically significant strong correlations between assault-injury and High Action *r* (12621) = .624, *p* < .01, assault-injury and Addiction *r* (12621) = .308, *p* < .01, and assault-injury and Protection Action *r* (12621) = 153, *p* < .01. Accordingly, there is sufficient evidence that there is a correlation between assault-injury and High Action, Addiction, and Protection.

Table 19

Correlation Matrix of Latent Factors and Latent Component Variable (Standardized)

	Protection	Addiction	High Action	Injury
Protection	1.000			
Addiction	-0.031*	1.000		
High Action	0.157*	0.175*	1.000	
injury	0.153 *	0.308*	0.624*	1.000

Note.* Statistically significant correlation at significance level *p*<.01

In Table 20, I reported the standardized regression coefficient estimates. The results of standardized regression coefficient estimate further illustrated that the latent factors were statistically significant predictors of assault injury. Since the variable of assault-injury is ordinal thus, its mean and variance are meaningless, the interpretation of the standardized regression coefficient estimates results seemed irrelevant.

Table 20

Regression Matrix of Latent variables on the Component variable (Standardized)

	Injury
Protection	0.097*
Addiction	0.318*
High Action	0.607*

Note. * Statistically significant standardized regression coefficient at significance level p<.01.

In the modified model, none of the latent endogenous factors (BETA) predicted any other latent factor, thus, the structural model did not include any indirect effects of relationships among latent factors on assault-injury. The total effects (i.e., direct+ indirect) of assault-injury on the latent factors were similar to the ML estimates (i.e., direct effects). The total effects (direct+ indirect) illustrated that High Action, Addiction, and Protection were statistically significant predictors of assault-injury. The estimates of total effects of latent factors on the related indicator variables were also similar to the direct effects (i.e., the ML estimates) of indicator variables on latent factors.

I reported total and standardized total effects of assault-injury on the indicator variables in Table 21. Excluding dental hygiene and school connectedness, all total effects of assault-injury on the observed dependent variables were statistically significant (t (12621) ±2.58, p < .01, two-tailed). The standard errors, which are the standard deviation of the coefficient, indicated the precision of calculations. The standard errors related to the total effects were in an acceptable range (.003 to .024; Princeton University, 2007). They indicated good precision of the population parameter estimates (see Table 21).

The total effects of assault-injury on the indicator variables illustrated that indicator variables depend, directly or indirectly, on assault-injury. The effects of assault-injury on the indicator variables were smaller in magnitude in comparison to the effects of the relevant latent factors on these variables. For instance, when all other variables in the model being equal, a .42 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly, directly or indirectly, correlated to a one unit increase in his/her report of engagement in aggression behavior(s) in the same year. An increase of .942 unit in High Action was statistically significantly, directly, correlated to a one unit increase in the adolescent's report of engagement in aggressive behavior(s) in the past year.

With all other variables in the model being equal, a .12 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly, directly or indirectly, correlated to his/her report of driving while high on drugs in the past year. At the same time, a 1.185 unit increase in Addiction was statistically significantly, directly, correlated to the adolescent's report of driving while high on drugs in the past year. With all other variables in the model being equal, a .04 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly, directly or indirectly, correlated to his/her report of lower grade scores in the past year compared to a 1.753 units increase in Protection that was statistically significantly correlated to a one unit increase in the adolescent's report of lower grade scores in the past year (see Tables 14 and 21).

The differences between the total effects of assault-injury on the indicator variables and the total effects of latent factors on the dependent variables suggested a mediation role of the latent factors on the relationships among assault-injury and the dependent variables. These differences also support the model adequacy.

Table 21

Total Effects of Assault-injury on the Indicator Variable

	Injury	
Indicator Variables	Unstandardized	Standardized
Physical activity/Ph_Activ	0.024*	0.028*
Standard error	(0.005)	
t-value	4.385	
Weapon carrying and use/weapon	0.445*	0.353*
Standard error	(0.010)	
t-value	45.440	
Delinquency/delinque	0.515*	0.228*
Standard error	(0.016)	
t-value	32.562	
Aggression/aggressi	0.419*	0.375*
Standard error	(0.009)	
t-value	48.019	
Risky sex/riskysex	0.370*	0.144*
Standard error	(0.018)	
t-value	20.540	
Cigarette smoking/Cigarett	0.097*	0.158*
Standard error	(0.003)	
t-value	28.340	
Marijuana use/ Marijuan	0.119*	0.193*
Standard error	(0.004)	
t-value	30.019	
Cocaine use/Cocain	0.099*	0.160*
Standard error	(0.003)	
t-value	28.382	
Inhalants use/Inhalant	0.062*	0.100*
Standard error	(0.003)	
t-value	22.786	
Heroin use/Heroin	0.112*	0.182*
Standard error	(0.004)	
t-value	29.490	
Needle use for drug injection/Needle	0.071*	0.003*
Standard error	(0.003)	
t-value	25.038	
Alcohol misuse/alcohol	0.572*	0.175*
Standard error	(0.020)	
t-value	29.257	

(*table continues*)

	Injury	
Indicator Variables	Unstandardized	Standardized
Driving drunk/Drunk_Dr	0.098*	0.158*
Standard error	(0.003)	
t-value	28.024	
Driving high on drugs/Drug_Dr	0.115*	0.187*
Standard error	(0.004)	
t-value	29.687	
Risk behavior intoxicated/riskbeha	0.570*	0.336*
Standard error	(0.012)	
t-value	45.651	
Healthy diet/healthyd	0.008*	0.004*
Standard error	(0.003)	
t-value	3.012	
Dental hygiene/Dental	0.000**	0.000**
Standard error	(0.001)	
t-value	-0.237	
Safety equipment use/Equipmen	-0.104*	-0.018*
Standard error	(0.024)	
t-value	-4.296	
Wearing a seat belt /Seatbel	-0.125*	-0.115*
Standard error	(0.007)	
t-value	-16.922	
Religiosity/Religios	0.124*	0.073*
Standard error	(0.007)	
t-value	17.896	
School performance/schoolpe	0.042*	0.019*
Standard error	(0.010)	
t-value	4.308	
School connectedness/schconne	0.007**	0.113**
Standard error	(0.003)	
t-value	2.381	

Note. * Statistically significant effect of assault-injury on the observed dependent variable
*** Statistically nonsignificant value, *t* is smaller than the critical value 2.58

The above table included the estimates of the effects of assault-injury on the indicator variables. It also included the standard error (standard deviation of the coefficient) and the t-value that is supposed to exceed the critical value 2.58 for statistically significant nonzero path. The total effects of assault-injury on the indicator variables were smaller than the effects of latent factors on the same variables. If the effect of assault-injury on indicator variables were greater than (or at least equal to) the total effects of latent factors on the indicator variables, the latent factors would be unnecessary in the model. This was not the case for this model.

In summary, all the unstandardized parameter estimates of indicator variables and latent factors had statistically significant nonzero values, except the path between Protection and dental hygiene. The squared multiple correlations were statistically significant; they indicated that indicator variables explained moderate percentages of the High Action and Protection and marginal percentage of the Addiction variance. The completely standardized estimates of the modified model indicated that the solution is acceptable; none of their absolute values exceeded unity. In the completely standardized solution, the values for path coefficients illustrated that all observed indicator variables, except dental hygiene, were significant predictors of the related factors and all latent factors were significant predictors of assault-injury. The standardized correlation matrix of the latent observed variable (i.e., assault-injury and the covariates) and latent factors (i.e., High Action, Addiction, and Protection) also illustrated statistically significant strong correlations between assault-injury and High Action, Addiction, and Protection. The standardized regression coefficient estimates and the total effects also illustrated that the latent factors were statistically significant predictors of assault injury. The standard errors related to all parameter estimates indicated a proper precision of the population parameter estimates. The differences between the total effects of assault-injury on each of the indicator variables in comparison to the effects of the relevant latent factors on the same dependent variable suggested that the model is appropriate. The former results allowed rejecting the first null sub hypothesis and accepting the first alternative subhypothesis H_{a1}: the construct of the multidimensional model explains the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and the latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES.

Research Question 2

Is there a correlation between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race?

Second null hypothesis *H02*: There is no correlation between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

Alternative hypothesis *Ha2*: There is a correlation between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

The model estimation and test statistics. For answering the second research question, I added reciprocal paths between High Action and Addiction, High Action and Protection, and Addiction and Protection and repeated the S-B scaled ML χ^2 test statistics. For this nonrecursive model, the scaled ML χ^2 test statistic of absolute model fit was χ^2 (282, n = 12,623) = 10073.438, p =.00 and the fit indexes were RMSEA = 0.052, 90% CI [.052, .053], p of close fit = 1.00, SRMR = 0.045, CFI = .80. The values of RMSEA, SRMR, and CFI suggested that the model requires modification. I reported a complete list of the nonrecursive model goodness-of-fit statistics in Appendix K.

According to the modification indices in the test statistics' results, I added covariance paths between the errors of the covariate sex and needle use for injecting illicit drugs and wearing a seat belt and eliminated the error covariance between High Action and Addiction. "Because a latent variable is unmeasured, its units of measurement must be fixed by the researcher. This condition concerns how the units of measurement of each latent variable are fixed. Each construct must have either... one fixed nonzero loading (usually 1.0)," (Kenny, 2012, para. 2). Accordingly, I fixed the paths between Protection and physical activity, High Action and wearing a seat belt, and Addiction and cigarette smoking to (1.00). Then, I repeated the S-B scaled ML χ^2 test statistic, for which I set the significant level to .01 (see Figure B6).

For the modified nonrecursive model, the scaled ML χ^2 test statistic of absolute model fit was χ^2 (280, n = 12,623) = 5651.490, p =.00 and the fit indexes were RMSEA = .039, 90% CI [.038, .039], p of close fit = 1.00, SRMR = .038, and CFI = .89. The values of RMSEA, p of close fit, SRMR, and CFI suggested good fit of the model. In Appendix L, I reported a complete list of goodness-of-fit statistics of the modified nonrecursive model. I also examined the fitted residuals in the model.

The largest fitted residuals were (-3.030) and (3.271) for the covariance of safety equipment use and school performance and the covariate age respectively. The safety equipment use has also large fitted residuals with the variables of wearing a seat belt (2.485), risky sexual behavior (2.065), weapon carrying and use (-2.701), and delinquency (-2.644). The former values in addition to the negative fitted residuals of safety equipment use with itself suggested a pattern of misfit of this variable.

I did not delete the variable of safety equipment use from the model for two reasons. First, the model's SRMR = .034 indicated an acceptable standardized mean square residual of the model. Second, my aim was to examine the influence of patterns of interactions among the latent factors on the exogenous variable in comparison to the same model (the modified theoretical model), whereas these interactions were missing. I took the potential misfit of the variable safety equipment use into account when I interpreted the related results.

The model good fit according to the values of the fit indexes and the absence of frequent misfit in the model allowed proceeding in testing the second hypothesis on this model. In the following, I compared the relevant test statistics of the modified nonrecursive model with the results of the modified (recursive) model of the first hypothesis. My aim, from such comparison, was to highlight the differences in parameter estimates between the two models. After that, I reported the structural relationships in the nonrecursive model to illustrate whether the inclusion of reciprocal paths between the latent factors had influence on assault-injury likelihood. I also reported an alternative model and its test statistics to assure the adequacy of the nonrecursive model.

The reduced form structural equations of the nonrecursive model illustrated statistically significant positive path coefficients between assault-injury and the three latent factors: High Action, Addiction, and Protection (see Table 22). The paths between assault-injury and the latent factors were also statistically significant in the recursive model, whereas the path coefficients between assault-injury and latent factors were all positive (see Table 14).

Table 22

Reduced Form Structural Equations

Protection =	- 0.148* SEX	- 0.0102*AGE	+ 0.0225*ses	+ 0.00660*Race	- 0.0599*Injury**
Standerr	(0.00486)	(0.00226)	(0.00365)	(0.00413)	(0.00366)
Z-values	-30.400	-4.517	6.165	1.599	-16.365
P-values	0.000	0.000	0.000	0.110	0.000
Protection = , Errorvar.= 0.0372, R^2 = 0.624***					
Standerr					
Z-values					
P-values					
Addiction =	- 0.00727* SEX	+ 0.0350*AGE	+ 0.00158*ses	+ 0.0438*Race	+ 0.0979*Injury**
Standerr	(0.00496)	(0.00221)	(0.00352)	(0.00381)	(0.00358)
Z-values	-1.467	15.849	0.450	11.503	27.327
P-values	0.142	0.000	0.653	0.000	0.000
Addiction = , Errorvar.= 0.402, R^2 = 0.157***					
Standerr					
Z-values					
P-values					
High Action =	- 0.0202* SEX	- 0.00317*AGE	- 0.00629*ses	- 0.00953*Race	+ 0.105*Injury**
Standerr	(0.00326)	(0.00164)	(0.00266)	(0.00288)	(0.00302)
Z-values	-6.185	-1.932	-2.364	-3.307	34.692
P-values	0.000	0.053	0.018	0.001	0.000
High Action = , Errorvar.= 0.0822, R^2 = 0.427***					
Standerr					
Standerr					
Z-values					

Note. R^2 for Structural Equations are Hayduk's (2006) Blocked-Error R^2
* LISREL term to link the path coefficient value to the relevant observed variable
** The path is statistically significantly nonzero at $p<.01$
*** The relative variance of the latent factor that the model explains

In SEM there are two levels: (1) the measurement level, also called measurement model (the indicator variables relationships with the latent unobserved factors: High

Action, Addiction, and Protection) and; (2) the structural level (i.e., structural model) that includes relationships between latent variables and factors. In my model, the structural level contains the assault-injury, the unobserved latent factors, and the covariates.

The above table explains the hierarchical structural equations/relationships between the latent variable and factors and excludes the relationships among unobserved latent factors. The *p*-values indicate significant nonzero path between assault-injury and all the three factors. The R-squared in the structural equations cannot be interpreted, only the R-square from reduced form indicates the relative variance of each factor that the model explains (Jöreskog, 1999). Each effects/structural coefficient indicates the magnitude of change in assault-injury that was predicted to accompany a unit change in the relevant latent factor. Each of these effects/structural coefficient was calculated when all other variables left unchanged at their original values.

In the nonrecursive model, the squared multiple correlations for reduced form illustrated that the relative indicator variables explained 43% of the High Action (R^2 =.427, p = .01), 16% of the Addiction (R^2 =.157, p = .01), and 62% of the Protection (R^2 =.624, p = .01) variance. In the recursive model, the related indicator variables explained relatively smaller variance of the latent factors: 41% of the High Action, 15% of the Addiction, and 49% of the Protection.

In Table 23, to illustrating the relationships in the structural model, I reported the structural equations, which differ from the above reduced form equations in that they include all structural paths. In these structural equations, except the path from Addiction to High Action ($\lambda_{Addiction\ x\ High\ Action}$ = .0123, SD = .0101, z = 1.213, p= .225), the reciprocal paths between the latent factors were all statistically significant nonzero at significant level $p<.01$.

The structural equations illustrated negative direct effects of High Action and Addiction on Protection: with all other variables and factors being unchanged each time, a one unit change in High Action was correlated with a -.580 unit change (decrease) in Protection ($\lambda_{High\ Action\ x\ Protection}$ = -.580, SD = .0314, z = -18.493, p= .00); at the same time, a one unit change in Addiction was correlated with a -.15 unit change (decrease) in Protection ($\lambda_{Addiction\ x\ Protection}$ = -.151, SD = .0148, z = -10.144, p= .00).

The structural equations indicated negative direct effects of High Action on Addiction and positive direct effect of Protection on Addiction: with all other variables and factors being unchanged each time, a one unit change in High Action was correlated with a -.19 unit change (decrease) in Addiction ($\lambda_{High\ Action\ x\ Addiction}$ = -.194, SD = .0095, z = -20.506, p= .00); simultaneously, a one unit change in Protection was correlated with a .59 unit change (increase) in Addiction($\lambda_{Protection\ x\ Addiction}$ = .589, SD = .0113, z = 52.191, p= .00). The Addiction did not have effect on High Action (p= .225), whereas a one unit change in Protection was correlated with a -.85 unit change (decrease) in High Action ($\lambda_{Protection\ x\ High\ Action}$ = -.849, SD = .0185, z = -45.975, p= .00) when all other variables and factors being unchanged each time (see Table 23).

Table 23

Structural Equations for Latent Variables and Factors

Protection =	- 0.151*Addiction^	- 0.580*High Action^	- 0.160* SEX	- 0.00680*AGE	+ 0.0191*ses	+0.00767*Race
Standerr	(0.0148)	(0.0314)	(0.00430)	(0.00192)	(0.00323)	(0.00378)
Z-values	-10.144	-18.493	-37.271	-3.539	5.916	2.027
P-values	0.000	0.000	0.000	0.000	0.000	0.043
	+ 0.0156*Injury^,	Errorvar.= -0.00686 , R^2 = 1.177				
Standerr	(0.00401)	(0.00245)				
Z-values	3.890	-2.795				
P-values	0.000	0.005				

W_A_R_N_I_N_G : Error variance is negative.

Addiction =	0.589*Protection^	- 0.194*High Action^	+ 0.0758* SEX	+ 0.0404*AGE	- 0.0129*ses	+ 0.0381*Race
Standerr	(0.0113)	(0.00945)	(0.00639)	(0.00281)	(0.00449)	(0.00467)
Z-values	52.191	-20.506	11.868	14.379	-2.872	8.157
P-values	0.000	0.000	0.000	0.000	0.004	0.000
	+ 0.153*Injury^,	Errorvar.= 0.606 , R^2 = 0.169				
Standerr	(0.00477)	(0.0119)				
Z-values	32.156	50.762				
P-values	0.000	0.000				

High Action =	- 0.849*Protection^	+ 0.0123*Addiction	- 0.145* SEX	- 0.0123*AGE	+ 0.0128*ses	- 0.00446*Race
Standerr	(0.0185)	(0.0101)	(0.00464)	(0.00170)	(0.00303)	(0.00326)
Z-values	-45.975	1.213	-31.334	-7.236	4.221	-1.369
P-values	0.000	0.225***	0.000	0.000	0.000	0.171
	+ 0.0527*Injury^,	Errorvar.= 0.0214 , R^2 = 0.551				
Standerr	(0.00338)	(0.00248)				
Z-values	15.596	8.620				
P-values	0.000	0.000				

Note. R^2 for Structural Equations are Hayduk's (2006) Blocked-Error R^2

* LISREL term to link the path coefficient value to the relevant observed variable

^ Statistically significant path coefficient at significance level $p<.01$

*** $p>.05$ indicating that the relative path is not statistically significantly nonzero

In SEM there are two levels: (1) the measurement level, also called measurement model (the indicator variables relationships with the unobserved latent factors: High Action, Addiction, and Protection) and; (2) the structural level, also called structural model, that includes relationships between latent variables and factors. In my model, the structural level contains the assault-injury, the unobserved latent factors, and the covariates.

The above table explains the hierarchical structural equations/relationships between the latent variable and factors and excludes the relationships among unobserved latent factors. The *p* values indicate significant nonzero path between assault-injury and all the three factors. The R-squared in the structural equations cannot be interpreted, only the R-square from reduced form indicates the relative variance of each factor that the model explains (Jöreskog, 1999). Each effects/structural coefficient indicates the magnitude of changes in assault-injury and each latent factor that were predicted to accompany a unite change in the relevant latent factor. Each of these effects/structural coefficient is calculated when all other things in the model left unchanged at their original values.

LISREL estimates of ML (i.e., path coefficients) of the latent factors and assault-injury in Table 25 indicated that all path coefficients were statistically significant nonzero (t (12621) ± 2.58, $p < .01$, two-tailed). It is noteworthy that the magnitude of the path coefficient between assault-injury and High Action was smaller in the nonrecursive model in comparison to the recursive model. In the recursive model, with all other things in the model being unchanged, a .05 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated with a one unit increase in his/her tendency to engage in High Action behaviors ($\gamma_{injury\ High\ Action} = .053$, $SE = .003$, t (12621) = 15.56, $p < .01$). In the recursive model, with all other things in the model being unchanged, a .45 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated with a one unit increase in his/her tendency to engage in High Action behaviors ($\gamma_{injury\ High\ Action}$ = .445, *SE* =.010, *t* (12621) = 45.440, *p* <.01).

The magnitude of the path coefficient between assault-injury and Addiction ($\gamma_{injury\ Addiction}$ = .153, *SE* = .004, *t* (12621) = 32.15, *p* <.01) was slightly higher in the nonrecursive model compared to the same path coefficient in the recursive model ($\gamma_{injury\ Addiction}$ = 0.097, *SE* =.003, *t* (12621) = 28.340, *p* <.01). The magnitude of the paths between assault-injury and Protection was equal in both models (see Tables 14 and 24).

Table 24

LISREL Estimates (ML)

GAMMA/ The Parameter Matrix of the Linear Relations Between the Latent Factors and the Component Variable

	Injury
Addiction	0.153*
Standard error	(0.00477)
t-value	32.156
High Action	0.0527*
Standard error	(0.00338)
t-value	15.596
Protection	0.156*
Standard error	(0.00401)
t-value	3.890

Note. *Statically significant regression coefficient at significant level *p*<.01

The values in the table above included the parameter estimate/ path coefficient between each of the latent factors and assault-injury. They also included the standard error (the standard deviation of the relative coefficient) and the *t*-value that is supposed to exceed the critical value of 2.58 for the path to be statistically significantly nonzero.

Nonzero coefficient means that the latent factor is statistically significantly correlated (significant predictor) to assault-injury.

In Table 25, all Ml parameter estimates of the path coefficients between indicator variables and latent factors were statistically significant (t (12621) ± 2.58, $p < .01$, two-tailed). Thus, all these paths had statistically significant nonzero values. In other words, the indicator variables were statistically significant predictors of the related latent factors. In the recursive model, the path between Protection and dental hygiene was not statistically significant nonzero (see Table 14).

The values of the path coefficients between the indicator variables and the related latent factors differed in the nonrecursive model from the recursive model. For instance, according to the ML (see Table 25), in the nonrecursive model, with all things in the model being unchanged, a 2.20 units change in the adolescent's tendency toward Addiction behaviors was correlated to a one unit increase in his/her report of engagement in delinquent behavior(s) in the past year ($\lambda_{delinquency\ x\ Addiction} = 2.202$, $p <.01$). Moreover, with all things in the model being unchanged, a 2.39 units difference in the adolescent's predisposition toward engagement in High Action behavior was correlated with one unit difference in the his/her report of engagement in delinquent behavior(s) in the past year ($\lambda_{delinquency\ x\ High\ Action} = 2.394$, $p <.01$). In the recursive model, the former values were $\lambda_{delinquency\ x\ Addiction} = 2.041$, $p <.01$ and $\lambda_{delinquency\ x\ High\ Action} = .711$, $p <.01$ respectively.

In the nonrecursive model, with all things in the model being unchanged, a 4.12 units difference in the adolescent's tendency toward engagement in High Action behaviors was correlated with a one unit difference in his/her report of engagement in aggression behavior(s) in the past year ($\lambda_{aggression}$ x $_{High\ Action}$ = 4.122, p <.01). At the same time, a 1.22 units change in the adolescent's tendency toward engagement in Addiction behavior was correlated with the adolescent's report of using marijuana in the past year ($\lambda_{marijuana\ x\ Addiction}$ = 1.222, p <.01). In the same model, and a 6.08 units difference in the adolescent's tendency toward engagement in Addiction behaviors was correlated with a one unit difference in her/his report of alcohol misuse and problem drinking in the past year ($\lambda_{alcohol\ misuse\ x\ Addiction}$ = 6.081, p <.01). In the recursive model, the former values were $\lambda_{aggression}$ x $_{High\ Action}$ = .942, p <.01, $\lambda_{marijuana\ x\ Addiction}$ = 1.226, p <.01, and $\lambda_{alcohol\ misuse\ x\ Addiction}$ = 5.872, p <.01respectively.

In the nonrecursive model, with all variables and paths being unchanged, a .85 unit difference in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one unit difference in her/his report of consuming healthy food item in the past day ($\lambda_{healthy\ diet\ x\ Protection}$ = .847, p <.01). At the same time, a .91 unit change in the adolescent's tendency toward engagement in Protection behaviors was correlated with one unit difference in her/his report of lower grades scores in the past year ($\lambda_{school\ performance\ x\ Protection}$ = .906, p <.01).

In the recursive model, a .33 unit change in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one unit difference in her/his report of consuming healthy food item in the past day ($\lambda_{healthy\ diet\ x\ Protection}$ = .334, p <.01); simultaneously, a 1.75 units difference in the adolescent's tendency toward engagement in Protection behaviors was correlated with one unit difference in her/his report of lower grades scores in the past year ($\lambda_{school\ performance\ x\ Protection}$ = 1.753, p <.01). Since the standard errors are the standard deviation of the coefficient (Princeton University, 2007), the smaller values of standard errors in the nonrecursive model (range from .003 to .055) in contrast with the recursive model indicated better precision of the population parameter estimates (see Tables 14 and 25).

Table 25

LISREL Estimates (ML)

LAMBDA-Y /Linear Relationships Among Latent Factors and Indicator Variables			
Variable	Protection	Addiction	High Action
Physical activity/Ph_Activ	1.000**	- -	- -
Standard error			
t-value			
Weapon carrying and use/weapon	- -	- -	4.493*
Standard error			(0.0555)
t-value			80.909
Delinquency/delinque	- -	2.202*	2.394*
Standard error		(0.0252)	(0.0237)
t-value		87.403	101.168
Aggression/aggressi	- -	- -	4.112*
Standard error			(0.0489)
t-value			48.163
Risky sex/riskysex	- -	2.926*	0.692*
Standard error		(0.0228)	(0.0154)
t-value		128.156	44.934
Cigarette smoking/Cigarett	- -	1.000**	- -
Standard error			
t-value			
Marijuana use/ Marijuan	- -	1.222*	- -
Standard error		(0.0149)	
t-value		82.225	
Cocaine use/Cocain	- -	1.020*	- -
Standard error		(0.0113)	
t-value		90.489	
Inhalants use/Inhalant	- -	0.653*	- -
Standard error		(0.00996)	
t-value		65.604	
Heroin use/Heroin	- -	1.139*	- -
Standard error		(0.0120)	
t-value		94.987	
Needle use for drug injection/Needle	- -	0.731*	- -
Standard error		(0.0108)	
t-value		67.746	
Alcohol misuse/alcohol	- -	6.081*	- -
Standard error		(0.0501)	
t-value		121.393	

(*table continues*)

Variable	Protection	Addiction	High Action
Driving drunk/Drunk_Dr	- -	1.050*	- -
Standard error		(0.0112)	
t-value		93.562	
Driving high on drugs/Drug_Dr	- -	1.220*	- -
Standard error		(0.0143)	
t-value		85.325	
Risk behavior intoxicated/riskbeha	- -	2.220*	2.726*
Standard error		(0.0199)	(0.0325)
t-value		111.565	83.854
Healthy diet/healthyd	0.847*	- -	- -
Standard error	(0.0177)		
t-value	47.760		
Dental hygiene/Dental	0.105*	- -	- -
Standard error	(0.0104)		
t-value	10.072		
Safety equipment use/Equipmen	-0.741*	- -	- -
Standard error	(0.0166)		
t-value	-44.663		
Wearing a seat belt /Seatbel	2.904*	- -	1.000**
Standard error	(0.0488)		
t-value	59.537		
Religiosity/Religios	0.646*	1.307*	- -
Standard error	(0.0180)	(0.0153)	
t-value	35.883	85.411	
School performance/schoolpe	0.906*	- -	- -
Standard error	(0.0150)		
t-value	60.230		
School connectedness/schconne	-0.259*	- -	- -
Standard error	(0.0143)		
t-value	-18.097		

Note. * The parameter estimate (path coefficient/loading) is statistically significant nonzero ($t \pm 2.58$, $p \leq .01$, two-tailed)
** Fixed path with $p<.01$. The significance level was obtained from the measurement equations (not reported).

The values in the table above included the path coefficient/loading/ parameter estimate of each of the indicator variables on the relative factor. They also included the standard error (the standard deviation of the relative coefficient) and the *t*-value that is supposed to exceed the critical value of 2.58 for the path to be statistically significantly nonzero. Nonzero coefficient means that the indicator variable is statistically significantly correlated (significant predictor) to the relevant factor.

The completely standardized estimates in Table 26 indicated that the solution is acceptable since none of their absolute values exceeded unity. In the completely standardized solution, whereas latent factors and variables and the indicators were standardized, the values of the standardized path coefficients illustrated that all observed indicator variables were statistically significant predictors of the related factors. In the recursive model, the completely standardized solution indicated that: (1) the model is acceptable and; (2) except dental hygiene, all indicator variables were statistically significant predictors of the related latent factors. In the following, I reported the structural relationships to answer the second research question.

Table 26

Completely Standardized Solution

LAMBDA-Y/Linear Relationships Among Observed and Unobserved Variables			
	Addiction	High Action	Protection
Physical activity/Ph_Active	- -	- -	0.165*
Weapon carrying and use/weapon	- -	0.588*	- -
Delinquency/delinque	0.290*	0.173*	- -
Aggression/aggressi	- -	0.617*	- -
Risky sex/riskysex	0.339*	0.044*	- -
Cigarette smoking/Cigarett	0.488*	- -	- -
Marijuana use/ Marijuan	0.599*	- -	- -
Cocaine use/Cocain	0.498*	- -	- -
Inhalants use/Inhalant	0.318*	- -	- -
Heroin use/Heroin	0.557*	- -	- -
Needle use for drug injection/Needle	0.354*	- -	- -
Alcohol misuse/alcohol	0.560*	- -	- -
Driving drunk/Drunk_Dr	0.514*	- -	- -
Driving high on drugs/Drug_Dr	0.598*	- -	- -
Risk behavior intoxicated/riskbeha	0.393*	0.265*	- -
Healthy diet/healthyd	- -	- -	0.065*
Dental hygiene/Dental	- -	- -	-0.023*
Safety equipment use/Equipmen	- -	- -	-0.018*
Wearing a seat belt /Seatbel	- -	0.150*	0.362*
Religiosity/Religios	0.232*	- -	0.052*
School performance/schoolpe	- -	- -	0.057*
School connectedness/schconne	- -	- -	-0.015*

Note. * Statistically significant standardized path coefficient at significance level $p<.01$

The values in the above table are the parameter estimates/ loading/ path coefficients between the indicator variables and relevant factors, but they are standardized. The completely standardized solution illustrates changes in each latent factor that are correlated to one standard deviation change in each indicator variables with all other variables and factors in the model being unchanged. Since the observed variables have different measurements (scales, ordinary, and dichotomous) that make means and variance meaningless, the interpretation of the results in the above table is irrelevant.

The regression coefficients of latent factors in the nonrecursive model illustrated that, except for the path between Addiction and High Action, all latent factors were statistically significantly correlated with each other; the Beta (latent factors) coefficients were statistically significant at $p < .01$(see Table 27).

Given the regression coefficients results, with all variables and factors in the model being unchanged, a -.58 unit change (decrease) in High Action was correlated with a one unit change in Protection (λ = -.580, p = .01) and a -.194 unit change (decrease) in High Action was correlated with a one unit change Addiction (λ = -.194, p = .01). With all variables and factors in the model being unchanged, a -.15 unit change (decrease) in Addiction was correlated with a one unit change in Protection (λ = -.151, p = .01). With all variables and factors in the model being unchanged, a .59 unit change (increase) in Protection was correlated with a one unit change in Addiction (λ = .589, p = .01); at the same time, a -.85 unit change (decrease) in Protection was correlated with a one unit increase in High Action (λ = -.849, p = .01; See Table 27). These coefficients were absent in the recursive model.

Table 27

Regression Coefficients of Latent Factors

BETA/ The Parameter Matrix of the Linear Relations among the Latent Factors			
	Protection	Addiction	High Action
Protection	- -	-0.151*	-0.580*
Addiction	0.589*	- -	-0.194*
High Action	-0.849*	0.0.012**	- -

Note. *Statically significant regression coefficient at significant level p<.01
** Statistically non-significant path coefficient (t smaller than the critical value 2.58 that is necessary for a path coefficient to be statistically significant nonzero

In Tables 28, I reported the completely standardized solution for the latent factors and assault-injury from the nonrecursive model's test statistics. The completely standardized solution results illustrated that all latent factors were significant predictors of assault-injury. Since the variable of assault-injury is measured at ordinal level, its mean and variance are meaningless. Therefore, the interpretation of the completely standardized relationships between assault-injury and the latent factors is rather irrelevant.

Table 28

Completely Standardized Solution

GAMMA/Linear Relationships among the Latent Factors and the Component Variable	
	injury
Protection	0.113*
Addiction	0.508*
High Action	0.318*

Note. * Statistically significant standardized path coefficient at significance level p<.01

The values in the above table are the parameter estimates/ loading/ path coefficients between the latent factors and assault-injury, but they are standardized. The completely standardized solution illustrates changes in assault-injury that are correlated with one standard deviation change in each latent factor. Since assault-injury is measured at ordinal level and its mean and variance are meaningless, the interpretation of the results in the above table is rather irrelevant.

In Tables 29, I reported the completely standardized solution for the relationships among unobserved latent factors in the nonrecursive model. These results illustrated that, except the path between Addiction and High Action, latent factors were statistically significant predictors of each other. The impact of Protection on the High Action was as that, with all paths in the model being unchanged, a -.70 standard deviation change (decrease) in the adolescent's tendency toward engagement in High Action behaviors was correlated with a one standard deviation increase in his/her tendency to engage in Protection behaviors (λ = -.698, *p* = .01). Simultaneously, Protection had negative (i.e., protection) influence on Addiction (λ = -.330, *p* = .01), but High Action had positive (i.e., risk) impact on Addiction (λ = .022, *p* = .01).

The adolescents' tendency toward High Action and Addiction affected their tendency toward Protection behavior differently. With all paths in the model being unchanged each time, a .269 standard deviation increase in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one standard deviation increase in her/his tendency to engage in Addiction behaviors (λ = .269, *p* = .01); at the same time, a -.701 standard deviation change (decrease) in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one standard deviation increase in her/his tendency to engage in High Action behaviors (λ = -.705, *p* = .01).

Table 29

Completely Standardized Solution

BETA/ Linear Relationships among the Latent Factors			
	Protection	Addiction	High Action
Protection	- -	-0.330*	-0.698*
Addiction	0.269*	- -	-0.106*
High Action	-0.705*	0.022	- -

Note. * Statistically significant standardized path coefficient at significance level *p*<.01
** Statistically nonsignificant path. There was no evidence that the path is nonzero.

The values in the above table are the parameter estimates/ loading/ path coefficients between the latent factors, but they are standardized. The completely standardized solution illustrates changes in a latent factor (columns) that are correlated with one standard deviation change in other latent factors (rows). This completely standardized solution was necessary since the observed variables have different measurements (scales, ordinary, and dichotomous); at the same time, unobserved latent factors measurement units are unknown.

The standardized correlation matrix of assault-injury and latent factors illustrated statistically significant strong positive correlations between assault-injury and High Action $r(12621) = .645$, $p<.01$ and assault-injury and Addiction $r(12621) = .316$, $p<.01$, and negative correlation between assault-injury and Protection $r(12621) = -0.388$, $p<.01$. The standardized correlation matrix also illustrated statistically significant strong correlations between the latent factors. Protection was negatively correlated with Addiction r (12621) = -0.673, $p<.01$) and High Action r (12621) = -0.646, $p<.01$, and High Action was positively correlated with Addiction r (12621) = .531, $p<.01$ (see Table 30).

Table 30

Correlation Matrix of Latent Factors and Latent Component Variable (Standardized)

	Protection	Addiction	High Action	Injury
Protection	1.000			
Addiction	-0.673*	1.000		
High Action	-0.646*	0.531*	1.000	
injury	-0.388*	0.316*	0.645*	1.000

Note. * Statistically significant correlation at significance level $p<.01$

I reported the standardized regression coefficient estimates in Table 31, which illustrated that the latent factors were statistically significant predictors of assault injury.

According to the correlation matrix results and the standardized regression coefficient estimates results, there is sufficient evidence that there is a correlation between assault-injury and latent factors and among latent factors.

Table 31

Regression Matrix of Endogenous Latent variables on the Component variable (Standardized)

	Injury
Protection	-0.435*
Addiction	0.324*
High Action	0.632*

Note. * Statistically significant standardized regression coefficient at significance level $p<.01$

In Tables 32 and 33, I respectively reported the total and indirect effects of assault-injury on the latent factors. The indirect effects indicated mediating effects of the interactions among latent factors on the relationships between assault-injury and each latent factor.

Specifically, of the .10 unit increase of the adolescent's report of assault-injury incidence in the past year that was attributable to a one unit change in his/her tendency toward engagement in Addiction behaviors, -.06 was attributable to the mediating effects of the interactions between the High Action, Addiction, and Protection holding the path between assault-injury and Addiction constant.

Of the .11 unit increase of the adolescent's report of assault-injury incidence in the past year that was attributable to a one unit change in his/her tendency toward engagement in High Action behaviors, .05 was attributable to the mediating effects of the interactions between the High Action, Addiction, and Protection holding the path between assault-injury and High Action constant. The mediating indirect effects of the interactions between the High Action, Addiction, and Protection had greater influence (indirect effects = -.08) on the relationship between injury and Protection than the total effects of injury on Protection (-.06) holding the later path constant.

The statistically significant total and indirect effects indicated that the population parameters of direct and indirect effects were nonzero and that the interactions among latent factors mediated the relationships between assault-injury and each of these factors. The standard errors related to parameter estimates indicated the proper precision of the population parameter estimates (Princeton University, 2007).

Table 32

Total Effects of the Component Variable on Latent Factors

	Injury
Protection	-0.060*
Standard error	(0.004)
z-value	-16.365
Addiction	0.098*
Standard error	(0.004)
z-value	27.328
High Action	0.105*
Standard error	(0.003)
z-value	34.693

Note. * Statistically significant effect of assault-injury on latent factor

The above table included the estimates of the total (direct + indirect) effects of assault-injury on latent factors. It also included the standard error (standard deviation of the coefficient) and the *z*-value that is supposed to exceed the critical value 2.58 for statistically significant non-zero path(s). The total effects of assault-injury on the latent factors are different from its indirect effects on the same latent factors. If indirect effects were not statistically significantly (i.e., no evidence that the effect is nonzero), this means that the interactions among latent factors did not influence the relationships between assault-injury and each of these factors. This was not the case for this model.

Table 33

Indirect Effects the Component Variable on Latent Factors

	Injury
Protection	-0.075*
Standard error	(0.003)
z-value	-26.402
Addiction	-0.056*
Standard error	-21.124
z-value	(0.003)
High Action	0.052*
Standard error	(0.003)
z-value	16.054

Note. * Statistically significant effect of assault-injury on latent factor

The above table includes the indirect effects of assault-injury on the indicator variables. It also includes the standard error (standard deviation of the coefficient) and the z-value that is supposed to exceed the critical value 2.58 for statistically significant non-zero path(s). The interactions among latent factors do not influence the relationships between assault-injury and each of these factors when indirect effects are not statistically significantly (i.e., no evidence that the indirect effect is nonzero). This was not the case for this model.

In Tables 34, I provided the total and standardized total effects of latent factors on each other. Table 35 included the indirect and standardized indirect effects of latent factors on each other. The results from both tables also indicated the mediating influence of the interaction of these factors on the paths between each pair of these factors.

Of the -.468 standard deviation difference in Addiction attributable to one standard deviation difference in High Action, -.362 was due to the interactions among High Action, Addiction, and Protection holding the path between Addiction and High Action constant.

Of the -1.057 standard deviation difference in Protection attributable to one standard deviation difference in High Action, -.359 was due to the interactions among High Action, Addiction, and Protection holding the path between Protection and High Action constant. Of the -1.115 standard deviation difference in High Action attributable to one standard deviation difference in Protection, -.409 was attributable to the interactions among High Action, Addiction, and Protection holding the former path constant.

Table 34

Total Effects of Latent Factors on Latent Factors

	Protection		Addiction		High Action	
	Total	Standardized	Total	Standardized	Total	Standardized
Protection	0.598*	0.598*	-0.251*	-0.551*	-0.879*	-1.057*
Standard error	(0.110)		(0.010)		(0.113)	
z-value	5.454		-25.954		-7.795	
Addiction	1.201*	0.548*	-0.191*	-0.191*	-0.854*	-0.468*
Standard error	(0.101)		(0.006)		(0.097)	
z-value	11.880		-30.735		-8.784	
High Action	-1.341*	-0.409*	0.223*	0.407*	0.735*	0.735*
Standard error	(0.123)		(0.007)		(0.111)	
z-value	-10.938		31.649		6.595	

Note. * Statistically significant total effect of latent factor on latent factor

The results of direct and indirect effects illustrated influence of the interactions between the latent factors on the relationships of assault-injury with High Action, Addiction, and Protection. Accordingly, I rejected the second research hypothesis and accepted the second alternative hypothesis H_{a2}: there is a correlation between adolescent assault-injury likelihood and patterns of interactions among high action, addiction, and protection variables when controlling for age, sex, SES, and race.

Table 35

Indirect Effects of Latent Factors on Latent Factors

	Protection		Addiction		High Action	
	Indirect	Standardized	Indirect	Standardized	Indirect	Standardized
Protection	0.598*	0.598*	-0.101*	-0.221*	-0.298*	-0.359*
Standard error	(0.110)		(0.009)		(0.082)	
z-value	5.454		-10.663		-3.642	
Addiction	0.612*	0.279*	-0.191*	-0.191*	-0.660*	-0.362*
Standard error	(0.095)		(0.006)		(0.094)	
z-value	6.449		-30.735		-7.007	
High Action	-0.493*	0.279*	0.211*	0.384*	0.735*	0.735*
Standard error	(0.106)		(0.009)		(0.111)	
z-value	-4.647		23.063		6.595	

Note. * Statistically significant indirect effect of latent factor on latent factor

Alternative Model

Examining an alternative model base on the constructs of the problem behavior system of Jessor's (1987) PBT was necessary for four reasons. First, Røysamb et al.' (1997) multidimensional model did not include interactions among the categories of High Action, Addiction, and Protection. Second, I based the second hypothesis on the assumption of interrelations between problem and protection behaviors in Jessor's (1987) PBS. Third, there was a lack of theoretical explanation, in the PBT, about the relationships among physical activity, dental hygiene, healthy diet, using safety equipment, wearing a seatbelt, and problem behavior (including youth assault-injury) likelihood. Forth, it was necessary to examine the nonrecursive model adequacy in contrast with a model that I based completely on the problem behavior system constructs.

I specified the alternative model in the form of a path diagram that included problem and protection behaviors that constitute the PBT's problem behavior system. These constructs were problem behaviors: cigarette smoking, marijuana use, various illicit drug use, problem drinking, risky sexual behavior, risky driving (driving drunk, and driving high on drugs) and deviant and norm-violating behaviors (weapon carrying and use, aggression, delinquency, and risk behavior while intoxicated), and protection behaviors: religiosity and academic achievement (school performance). This alternative model included three latent components: two latent factors (Risk and Protection) and one component variable (assault-injury) in addition to the covariates. "Because a latent variable is unmeasured, its units of measurement must be fixed by the researcher. This condition concerns how the units of measurement of each latent variable are fixed. Each construct must have ... one fixed nonzero loading (usually 1.0)," (Kenny, 2012, para. 2). Accordingly, I fixed the paths between High Action and aggression and Protection and religion to (1.00). I included reciprocal paths between Risk and Protection. Then I performed S-B scaled ML χ^2 test statistic on the alternative model after setting the significance level of the test to .05.

For the alternative model, the scaled ML chi-square test statistic of absolute model fit was χ^2 (172, n = 12,623) = 13342.247, p =.00 and the fit indexes were RMSEA = 0.078, 90% CI [.077, .079], p of close fit= 1.00, SRMR = 0.06, and CFI = 0.70. The values of RMSEA, SRMR, and CFI suggest that the model requires modifications.

According to the modification indices, I added covariance between the errors of aggression and weapon carrying and use, the errors of cocaine use and inhalants and heroin use, and the errors of inhalants use and heroin use. I covaried the errors of needle use for injecting drugs and cigarette smoking, marijuana use, cocaine use, inhalants use, heroin use, alcohol misuse, and the covariate sex. I also covaried the errors of alcohol misuse and driving drunk and the errors of driving while high on drugs and marijuana use and driving drunk (see Figure 7). Then I repeated the S-B scaled ML chi-square test statistic.

For the modified alternative model (See Figure B8), the scaled ML χ^2 test statistic of absolute model fit was χ^2 (158, n = 12,623) = 6007.995, p =.00 and the fit indexes were RMSEA = .054, 90% CI [.053, .055], p of close fit = 1.00, SRMR = .045, and CFI = .87. The values of RMSEA, SRMR, and CFI suggested close fit of the model. I reported a complete list of goodness-of-fit statistics of the alternative model in Appendix M. The largest fitted residuals in this model were (2.803) for the covariance of risky sexual behavior and the covariate age and (-3.213) for the covariance of alcohol misuse with itself. None of these fitted residuals suggested potential patterns of a misfit in the model.

The ML estimates of the measurement model in Table 36 illustrated that all indicator variables were statistically significant predictors of the relative factors ($t \pm 2.58$, $p \leq .05$, two-tailed). According to the ML results, all paths in the measurement model were statistically significantly nonzero at significance level $p \leq .05$. The indicator variables explained 22% of the Risk and 50% of the Protection variance.

Table 36

LISREL Estimates (Maximum Likelihood)

Variable	Protection	Risk
Weapon carry and use/Weapon	- -	1.232*
Standard error		(0.0287)
t-value		42.980
Delinquency/delinque	- -	2.140*
Standard error		(0.0461)
t-value		46.420
Aggression/aggressi	- -	1.000**
Standard error		
t-value		
risky sex/riskysex	- -	2.085*
Standard error		(0.0498)
t-value		41.893
Cigarette smoking/Cigarett	- -	0.684*
Standard error		(0.0174)
t-value		39.415
Marijuana use/ Marijuan	- -	0.840*
Standard error		(0.0206)
t-value		40.851
Cocaine use/Cocain	- -	0.716*
Standard error		(0.0183)
t-value		39.034
Inhalants use/Inhalant	- -	0.504*
Standard error		(0.0160)
t-value		31.550
Heroin use/Heroin	- -	0.778*
Standard error		(0.0193)
t-value		40.361
Needle for drug injection/Needle	- -	0.588*
Standard error		(0.0158)
t-value		37.216
Alcohol misuse/ alcohol	- -	3.941*
Standard error		(0.0924)
t-value		42.629
Driving drunk/Drunk_Dr	- -	0.653*
Standard error		(0.0179)
t-value		36.540
Driving high on drugs/Drug_Dr	- -	0.779*
Standard error		(0.0198)
t-value		39.262

(*table continues*)

Variable	Protection	Risk
Risk behavior intoxicated/riskbeha	- -	2.435*
Standard error		(0.0471)
t-value	3.413*	51.700-
Religiosity/Religios	(0.0102)	-
Standard error	333.403	
t-value	-0.588*	
School performance/schoolpe	(0.0107)	- -
Standard error	-54.944	
t-value		

Note. * The parameter estimate (path coefficient/loading) is statistically significant nonzero ($t \pm 2.58$, $p \leq .01$, two-tailed)

** Fixed path with $p<.01$. The significance level was obtained from the measurement equations (not reported).

The values in the table above included the path coefficient/loading/parameter estimate of each of the indicator variables on the relative factor. They also included the standard error (the standard deviation of the relative coefficient) and the *t*-value that is supposed to exceed the critical value of 2.58 for the path to be statistically significantly nonzero. Nonzero coefficient means that the indicator variable is statistically significantly correlated (significant predictor) to the relevant factor.

In Table 37, the ML estimates illustrated statistically significant path coefficients between assault-injury and Risk and Protection. With all other variables left unchanged at their original values each time, a .20 units change in the adolescent's report of assault-injury incidence in the past year was correlated to a one unit change in his/her tendency toward Risk behaviors ($\gamma = .200$, $SE = .00671$, $z = 29.844$, $p < .05$, two-tailed) and a -.02 unit change in the adolescent's report of assault-injury incidence in the past year was correlated to a one unit change in his/her tendency toward Protection behaviors ($\gamma = -.0232$, $SE = .00498$, $z = -4.650$, $p < .05$, two-tailed). The squared multiple correlations for reduced form indicated that the model explained 22% of the Risk and 50% of the Protection variance. All paths in the alternative model were statistically significant nonzero at significant level p=.05 (see Figure 8 and Tables 38 and 39).

Table 37

LISREL Estimates (ML)

GAMMA/ The Parameter Matrix of the Linear Relations Between the Latent Factors and the Component Variable	
	Injury
Risk	0.200*
Standard error	(0.00671)
t-value	29.844
Protection	-0.023*
Standard error	(0.00498)
t-value	-4.650

Note. * Statistically significant standardized regression coefficient at significance level p<.01.

The standardized correlation matrix of the component variable and latent factors illustrated statistically significant strong correlations between assault-injury and Risk r (12621) = .437, p<.05 and assault-injury and Protection r (12621) = 252, p<.05. In other words, there is sufficient evidence that there is a correlation between assault-injury and Risk and Protection. The standardized regression coefficient estimates also illustrated that Risk and Protection were statistically significant predictors of assault injury.

The completely standardized estimates of the alternative model indicated that the solution is not acceptable; one of their absolute values exceeded unity. The value of the standardized path coefficient between Risk and Protection exceeded unity (γ = 1.129, p< .05). Jöreskog (1999) noted that "elements of Λ_y and Λ_x are regression coefficients, and if B = 0 or if B is subdiagonal and Ψ is diagonal, then the elements of B and Γ are also regression coefficients. Otherwise, in the general case, the elements of Β and Γ are structural coefficients, and these can also be larger than one in magnitude in the completely standardized solution." (para. 3). The Λ_y and Λ_x are loadings for all measured variables, Ψ is the matrix of variance and covariances of exogenous latent variables, endogenous disturbance, and covariances among endogenous disturbances, Β is the matrix of causal path, Γ is the matrix of causal path from exogenous to endogenous variables. Jöreskog (1999) explanation of coefficients values that exceed unity in the completely standardized solution supports the inadequacy of the alternative model in both instances. First, in the alternative model, $B \neq 0$, and, according to the SEM test results, Β is diagonal, not subdiagonal. Second, the elements of Β and Γ may be larger than one, only, when the squared multiple correlations are close to unity, which also was not the case in the alternative model (the R-squared for reduced form was R^2 =.224 for the latent factor Risk and R^2 =.509 for the latent factor Protection). I did not report the standardized and completely standardized total and indirect effects, although statistically significant, since the structural model has an inadequate standardized value between the factors of Risk and Protection. Accordingly, the non-recursive model seemed acceptable in comparison to the alternative model.

In conclusion, according to the fit indexes values, the nonrecursive model with additional reciprocal paths between each pair of latent factors was acceptable. In the nonrecursive model, except the path between Addiction and High Action, all paths among the latent factors, latent factors and the component variable, and indicator variables and relevant latent factors were statistically significant nonzero. The squared multiple correlations for reduced form illustrated that the related indicator variables explained greater variance of the latent factors in the non-recursive model in contrast with the recursive model. In the nonrecursive model, assault-injury was statistically significant positively correlated with High Action, Addiction, and Protection.

The total and indirect effects of the component variable (assault-injury) on the latent factors and the latent factors on each other were all statistically significant; they indicated that the population parameters of direct and indirect effects are nonzero. The standardized indirect effects indicated influence of the interactions among latent factors on the relationships between assault-injury and each of the other latent factors. The former results allowed me to reject the second null hypothesis and accept the second alternative hypothesis H_{a2}: there is a correlation between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection factors when controlling for age, sex, SES, and race.

I examined an alternative model that included all the problem behavior system's construct and two latent factors: Risk and Protection. I examined this model since the interaction between these categories is a core assumption of the PBT and was not a component of Røysamb et al.' (1997) multidimensional model. The fit indexes illustrated close fit of the alternative model, in which all paths were statistically significant nonzero. In the alternative model, there were strong evidence of correlations between assault-injury and the Risk and Protection factors. The completely standardized solution included an absolute value that exceeded unity in the structural model. This value indicated that the model is inadequate and prevented further examination of the influence of interaction between the latent factors on assault-injury. Accordingly, the modified nonrecursive model was adequate for testing the second research hypothesis and supported my decision to reject the second null hypothesis and accept the second alternative hypothesis.

Summary

The fit indexes values of the theoretical model indicated that the model requires modifications. After modifying the theoretical model according to the modification indices, the model fit indexes RMSEA = .038, p = 1.00, 90% CI [.037, .039], SRMR = .044, CFI = .89 illustrated good fit of the modified model. The results from examining the fitted residuals illustrated no potential patterns misfit in the modified model. The fit indexes and the fitted residual examination results allowed me to reject the first research hypothesis and accept the first alternative hypothesis H_a: the construct of the multidimensional model does explain the youth assault-injury underlying structure among the dependent variables controlling for age, sex, race, and SES.

For answering the first subquestion, I examined the parameter estimates of the modified model. Except the path between Protection and dental hygiene, all the unstandardized parameter estimates of indicator variables and latent factors had statistically significant nonzero values. The squared multiple correlations were statistically significant and indicated that indicator variables explained moderate percentages of the High Action and Protection and relatively small percentage of the Addiction variance.

The completely standardized estimates of the modified model indicated that the solution is acceptable since, none of their absolute values exceeded unity. In the completely standardized solution, the values of the path coefficients illustrated that all observed indicator variables, except dental hygiene, were significant predictors of the related factors and all latent factors were significant predictors of assault-injury. The standardized regression coefficient estimates and the total and standardized total effects also illustrated that the latent factors were statistically significant predictors of assault injury. The standard errors related to all parameter estimates indicated the proper precision of the population parameter estimates. The differences between the completely total effects of assault-injury on each of the indicator variables in comparison to the effects of the relevant latent factors on the same indicator variable suggested mediating effects of the latent factors on the relationships between assault-injury and each of the indicator variables. The former results allowed me to reject the first null subhypothesis and accept the first alternative subhypothesis H_{a1}: the construct of the multidimensional model explains the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, various illicit drug use, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES.

For answering the second research question, I added reciprocal paths between each pair of the latent factors and repeated the SEM test statistics. After modifying the model according to the modification indices, the fit indexes of this nonrecursive model suggested that the model fits the data. In the nonrecursive model, excluding the path between Addiction and High Action, all paths among the latent factors, latent factors and the component variable, and indicator variables and related latent factors were statistically significant nonzero. The total and indirect effects of the component variable (assault-injury) on the latent factors and the latent factors on each other were all statistically significant; they indicated that the population parameters of direct and indirect effects are nonzero. The indirect effects indicated influence of the interactions among latent factors on the relationships between assault-injury and each of these factors. Accordingly, I rejected the second null hypothesis and accept the second alternative hypothesis H_{a2}: there is a correlation between adolescent assault-injury likelihood and patterns of interactions among High action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

I also examined an alternative model that included all the problem behavior system's construct and two latent factors: Risk and Protection. Testing this alternative model was necessary since the interaction between risk and protective behaviors is a core assumption of the PBT and was not a component of Røysamb et al.' (1997) empirical model. The fit indexes illustrated close fit of the alternative model, in which all paths were statistically significant non-zero. In the alternative model, assault-injury statistically significantly correlated with the factors of Risk and Protection. The completely standardized solution included an absolute value that exceeded unity in the structural model. This value indicated that the model is inadequate and prevented further examination of the influence of the interactions between the latent factors on assault-injury. Accordingly, the modified nonrecursive model was adequate for testing the second research hypothesis.

In this chapter, I reported the statistical tests results for answering each of my research questions. In the next chapter, I interpreted these results in comparison to the related available scientific knowledge. I also discussed my study's limitations and my study's results implications.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

My purpose in conducting this cross-sectional quantitative study was to examine if the construct of Røysamb et al.'s (1997) multidimensional model explains the underlying structure of American youth assault-injury. In this study, I compared first-order variables (physical training, weapon carrying and use, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking, alcohol misuse, car driving while intoxicated, risk behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing a seat belt, religiosity, school performance, and school connectedness) and second-order factors (High Action, Addiction, and Protection) to the variable of assault-injury at the third-order level, while controlling for age, sex, race, and SES. My subsequent aim was to use the construct of the multidimensional model to examine the structure and patterns of the relationships between variables at the third-order level and categories at the second-order level and youth assault-injury.

Assault-injury is one of the five leading causes of youth death in the United States (CDC, 2013d). Despite the seriousness of this problem, it is noteworthy that researchers have not examined youth assault-injury etiology in the United States in the past 10 years by using an inclusive list of risk and protective factors. Rather, researchers have used the lens of PBT to examine a limited number of youth assault-injury risk and protective factors (Cunningham et al., 2011; Linakis et al., 2009; Murphy et al., 2010). Many authors have reported that the problem behavior theory's assumption of one-dimension co-occurrence of problem behaviors explained only a small proportion of variation in problem behaviors; researchers' results illustrated that multidimensional structures explained a greater proportion of the variation of problem behaviors co-occurrence (Dukes et al., 2010; Guilamo-Ramos et al., 2005; Martinez-pons, 2011; Willoughby et al., 2004). My study was the first that examined American adolescent assault-injury from a multidimensional perspective by using an inclusive list of risk and protective variables.

I specified the structural equation model in the form of a path diagram of the theoretical model in LISREL 9.2 graphics. I set the significance level of the test statistics to (.01). The large sample size was sufficient for assuring test power $1-\beta = .99$.The SEM test statistics results indicated a close fit of the theoretical model, which I modified according to the modification indices. After doing so, the modified theoretical model fit indexes RMSEA = .038, 90% CI [.037, .039], *p* of RMSEA close fit = 1.00, SRMR = .044, CFI = 0.89 illustrated a good fit of the modified model to the data. The fitted residuals examination's results illustrated no potential patterns of a misfit in the modified model. The fit indexes and the fitted residual examination results allowed me to reject the first research hypothesis and accept the first alternative hypothesis H_a: The construct of the multidimensional model does explain the youth assault-injury underlying structure among the dependent variables controlling for age, sex, race, and SES.

In the modified hypothetical model, except for the path between Protection and dental hygiene, all the unstandardized parameter estimates (linear relationships/path coefficients) of indicator variables and latent factors had statistically significant nonzero values. In other words, all indicator variables were statistically significantly correlated with the relevant factors. The latent factors/categories of High Action, Addiction, and

Protection were also statistically significantly correlated with assault-injury. The squared multiple correlations of latent factors were statistically significant; they showed that indicator variables explained moderate percentages of the High Action and Protection variance and a relatively small percentage of the Addiction variance. The variable of safety equipment use was negatively correlated with Protection and the variable of wearing a seat belt was negatively correlated with both Protection and High Action. These negative correlations suggested protection effects of safety equipment use and seat belt use on the factors/categories of Protection and High Action respectively. All other predictor variables were positively correlated with the relevant latent factors. The three latent factors were positively correlated with assault-injury; in this model, none of the latent factors had protection influence (negative correlation) on assault-injury. The differences between the total and completely standardized total effects of assault-injury on each of the indicator variables in comparison to the impact of the relevant latent factors on the same indicator variables suggested statistically significant mediating effects of the latent factors on the relationships between assault-injury and each of the indicator variables. The mediating impact of the latent factors on the relationships between assault-injury and each indicator variable supported the model adequacy.

The former results allowed me to reject the first null subhypothesis and accept the first alternative subhypothesis H_{a1}: The construct of the multidimensional model does explain the relationships among the variables of physical training, carrying and use of weapons, risky sexual behavior, delinquency, aggression, smoking, use of various illicit drugs, problem drinking and alcohol misuse, driving while intoxicated, risky behavior while intoxicated, proper diet, dental hygiene, using safety equipment, wearing seatbelt, religiosity, school performance, and school connectedness, and latent factors of High Action, Addiction, and Protection, and youth assault-injury controlling for age, sex, race, and SES.

For testing the second research hypothesis, I added reciprocal paths between each pair of latent factors and repeated the SEM test statistics. According to the modification indices, I modified the model and repeated the SEM test statistics. The fit indexes of this modified nonrecursive model were RMSEA = .039, 90% CI [.038, .04], SRMR = 0.0377, *p* of RMSEA close fit = 1.00, and CFI = .89; they suggested that the model fits the data. In the nonrecursive model, except for the path between Addiction and High Action, all paths among the latent factors, latent factors and assault-injury, and indicator variables and relative latent factors were statistically significant nonzero. All indicator variables were statistically significant predictors of the related factors, which were statistically significant predictors of each other (except Addiction to High Action) and of assault-injury. The total and indirect effects of the component variable (assault-injury) on the latent factors and the latent factors on each other were all statistically significant; they indicated that the population parameters of direct and indirect effects were nonzero. The indirect and standardized indirect effects indicated influence of the interactions among latent factors on the relationships between assault-injury and each of these factors. Accordingly, I rejected the second null hypothesis and accepted the second alternative hypothesis H_{a2}: A correlation exists between adolescent assault-injury likelihood and patterns of interactions among High Action, Addiction, and Protection variables when controlling for age, sex, SES, and race.

I also examined an alternative model that included the behavior system's constructs (risk and protection behaviors) and two latent factors (Risk and Protection) according to the PBT constructs. Testing this alternative model was necessary since the interaction between risk and protective behaviors is a core assumption of the PBT and was not a component of Røysamb et al.'s (1997) empirical model. The fit indexes illustrated a close fit of the alternative model, in which all paths were statistically significant nonzero. In the alternative model, assault-injury statistically significantly correlated with the factors of Risk and Protection. The completely standardized solution included an absolute value that exceeded unity in the structural model. This value indicated that the model is inadequate and prevented further examination of the influence of the interactions between the latent factors on assault-injury. Accordingly, the modified nonrecursive model was adequate for testing the second research hypothesis.

Interpretation of the Findings

My study’s findings exemplified the complexity of systems of the behavior of assault-injury. Correlations between assault-injury and the risk and protective behaviors were not merely a direct effect of one behavior on another, but rather the results of complicated interactions among an array of observed and unobserved behaviors. The findings of the statistically significant influence of dynamic patterns of interactions among categories of various behaviors (the adolescent’s predisposition toward risk and protective behavior) on a particular risk behavior (assault-injury) further illustrated the complexity of assault-injury.

The SEM test statistics results illustrated the adequacy of the multidimensional model for explaining the underlying structure of youth assault-injury. My study's findings indicated mediating effects of the adolescent's disposition toward High Action, Addiction, and Protection behaviors on youth assault-injury and on the relationships between assault-injury and the indicator variables. My study was the first to examine, and perhaps explain, the structural mediating effects of adolescent's disposition toward categories of risk and protection on the occurrence of youth assault-injury and on the relationships between assault-injury and the High Action, Addiction, and Protection behaviors.

This study's findings illustrated that the interactions among the factors/categories of High Action, Addiction, and Protection influenced the adolescent's predisposition toward each of these categories and the likelihood of assault-injury. My study was also the first to examine, and thus dimensionally explain, the influence of interactions among the second-order factors of High Action, Addiction, and Protection on the adolescent's predisposition toward each of these categories.

In the literature I reviewed, I found no theoretical explanation, in the PBT, about the relationships among physical activity, dental hygiene, healthy diet, using safety equipment, wearing a seat belt, and problem behavior likelihood (including youth assault-injury). Nor did I find research, in the literature I reviewed, into the relationships between assault-injury and physical activity, dental hygiene, healthy diet, using safety equipment, and wearing a seatbelt. To my knowledge, my study was the first to examine these relationships.

Reflection on this Study's Findings from PBT Perspectives

In the PBT, Jessor (1987) suggested that, in the behavior system, each of the two structures (risk and protection) functions as a constraint on the other. In the behavior system, the protection structure included religiosity (frequency of church attendance) and academic achievement. The risk structure of the behavior system encompassed smoking cigarettes, drinking alcohol, problem drinking, drug use, delinquent behaviors (e.g., lying, stealing, and aggressive behavior), and unprotected sexual intercourse. Jessor suggested that the occurrence of any one risk behavior increases the likelihood of occurrence of other risk behaviors in a syndrome of problem behavior. In this PBS, the occurrence of protection behaviors decreases the occurrence of risk behaviors.

In my study, the latent factors of High Action and Addiction reflected the structure of risk behavior of the behavior system of the PBT. The latent factor of Protection included the PBT’s protection constructs (school performance and religiosity) in addition to other variables that reflected expressions of the adolescent orientation toward society and healthy behavior.

My study’s results contradicted, in part, Jessor’s (1987) suggestion that the functions of the protection behaviors constrain to the risk behaviors; the category of Protection behaviors constrained the study's High Action but not the Addiction behaviors. Specifically, in the nonrecursive model, a .27 standard deviation increase in Addiction was correlated with a one standard deviation increase in Protection (β = - .269, *SE* = .01, *t*

(12.621) = 52.191, p < 01) with all other things in the model being unchanged. This relationship between Protection and Addiction illustrated that the adolescent's disposition toward protection behaviors did not result in direct protection but had risk effects in terms of the adolescent's disposition toward Addiction behaviors. Conversely, in the same nonrecursive model, a .71 standard deviation decrease in High Action was correlated to a one standard deviation increase in Protection (β = - .705, SE = .02, t (12.621) = -45.975, p<01) with all other things in the model being unchanged. The relationship between Protection and High Action illustrated that the adolescent's tendency toward protection behaviors results in direct protection effects in terms of the adolescent's disposition toward High Action behaviors.

As Jessor (1987) suggested in the PBT, the categories of risk behaviors in my study functioned as a constraint upon the Protection category. Expressly, in the nonrecursive model, the two factors of risk behavior (High Action and Addiction) had negative statistically significant path coefficients with the Protection category. With all other things in the model being unchanged, a .33 standard deviation decrease in Protection was correlated with a one standard deviation increase in Addiction (β = -.330, SE = .02, t (12.621) = -10.144, p <.01); at the same time, a .70 standard deviation decrease in Protection correlated with a one standard deviation increase in High Action (β = -.698, SE = .03, t (12.621) = -18.493, p <.01).

Also in contradiction to Jessor's (1987) assumption that the occurrence of any one risk behavior increases the likelihood of occurrence of other problem behaviors, according to my study's findings, the adolescents' disposition toward High Action behaviors was statistically significantly correlated with a decrease their disposition toward Addiction behavior. All other things in the model being unchanged, a .11 standard deviation decrease in Addiction correlated with a one standard deviation increase in High Action (β = -.106, *SE* = .01, *t* (12.621) = -20.506, *p* <.01). The SEM test statistics results illustrated that the path coefficient between Addiction and High Action was not statistically significant nonzero, which in turn suggested the absence of relationships (i.e., no influence) between the adolescents' disposition toward Addiction behaviors and their disposition toward High Action behaviors.

This study's findings were, however, in accordance with Jessor's (1987) identification of the groups of variables as *systems*. This identification related to the dynamic of the interrelations between variables in each system and between systems, namely proneness, which determines the adolescents' behavioral predisposition in favor of normative or problem behaviors. As an illustration, in the nonrecursive model, the interactions among the categories of High Action, Addiction, and Protection had mediating effects on the relationships between each pair of categories and on the other categories. Of the total effects (direct and indirect) of a .47 standard deviation decrease in Addiction attributable to a one standard deviation increase in High Action, -.36 was due to the interactions among High Action, Addiction, and Protection holding the path between Addiction and High Action constant. Of the total effects of a 1.06 standard deviation decrease in Protection attributable to a one standard deviation increase in High Action, -.36 was due to the interactions among High Action, Addiction, and Protection holding the path between Protection and High Action constant. Of the total effects of a

1.12 standard deviations decrease in High Action attributable to a one standard deviation increase in Protection, -.41 standard deviation was attributable to the interactions among High Action, Addiction, and Protection holding the path between High Action and Protection constant. It is noteworthy that although total effects of latent factor/category on each other were positive, the indirect effects (the influence of interaction among the latent factors) were all negative. In other words, the interactions among latent factors had protection effects on the relationships between each pair of these factors.

My study's findings about the protection structure of the behavior system contradicted Jessor’s (1987) assumptions about this structure in two ways. First, while both religiosity and school performance constituted the protection structure in Jessor's PBT, my study's findings illustrated greater influence of religiosity on High Action than on Protection. Specifically, in both the recursive and nonrecursive models, religiosity had a greater influence on adolescents' tendency toward engagement in High Action than on their predisposition toward Protection behaviors. In my study, the higher scores on the religiosity variable denoted less church attendance, less involvement in church-related activity, lower daily prayers, and decrease in the adolescents' perception of religion as important. In the recursive model, with all other things in the model being unchanged, an increase of 1.19 units in Addiction and an increase of .34 unit in Protection were correlated to an increase of one unit in religiosity scores (i.e., lower religiosity). In the nonrecursive model, all other things in the model being unchanged, an increase of 1.31 units in Addiction and an increase of .65 units in Protection were correlated to an increase of one unit in religiosity scores (again, lower religiosity).

Second, while Jessor (1987) suggested the influence of protection upon school performance, on the adolescents' predisposition toward protection behavior, this study's findings illustrated that lower school performance increased the adolescents' predisposition toward Protection behaviors in the recursive and nonrecursive models. However, the interactions between High Action, Addiction, and Protection in the nonrecursive model influenced the relationship between school connectedness and Protection; lower school connectedness decreased the adolescent predisposition toward Protection behaviors. In my study, higher scores on the variable of school performance denoted that adolescents had lower grades. Likewise, for the school connectedness, higher scores on school connectedness variable reflected that adolescents were less connected to their schools.

Jessor’s (1987) assumption of the likely constraining influence of religiosity and school performance on the risk behaviors did hold for the relationships between assault-injury likelihood and the variables of religiosity and school performance in this study. My study’s results illustrated that lower religiosity and lower school performance (i.e., lower grade scores) were correlated with an increase in assault-injury scores through the two-segment path in the recursive model (i.e., assault-injury → Protection→ school performance and assault-injury → Protection→ religiosity) and the two-segment and multisegment paths in the non-recursive model (e.g., assault-injury → Protection →Addiction→ Protection → High Action→ Protection → school performance; see Figure 6).

In my study, the relationships between assault-injury and the two risk categories were parallel to Jessor's (1987) assumption that adolescents' engagement in one risk behavior increases the likelihood of engagement in other risk behaviors. In the recursive model, holding all other paths in the model constant each time, an increase of .45 units of the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated to a one unit increase in High Action ($\gamma_{injury\ High\ Action}$ = 0.445, *SE* = .010, *t* (12621) = 45.440, *p* <.01, two-tailed); at the same time, a .10 unit increase of the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated to a one unit increase in Addiction ($\gamma_{injury\ Addiction}$ = 0.097, *SE* =.003, *t* (12621) = 28.340, *p* <.01, two tailed). In the nonrecursive model, all other things in the model being unchanged each time, a .05 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated with a one unit increase in his/her tendency to engage in High Action behaviors ($\gamma_{injury\ High\ Action}$ = .053, *SE* = .003, *t* (12621) = 15.56, *p* <.01); simultaneously, a .15 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated with a one unit increase in his/her tendency to engage in Addiction behaviors ($\gamma_{injury\ Addiction}$ = .153, *SE* = .004, *t* (12621) = 32.15, *p* <.01).

Jessor's assumption that the occurrence of any one risk behavior increases the likelihood of occurrence of other problem behaviors also did indeed hold for the relationships between assault-injury likelihood and each of the High Action and Addiction indicator variables (risk behaviors). My study's findings illustrated that increases in scores of any of the High Action or Addiction behaviors were correlated with an increase in assault-injury likelihood.

In summary, my study's results illustrated that the category of protection behavior constrained the High Action but not the Addiction behaviors. These findings contradicted Jessor's (1987) suggestion that the functions of the protection behaviors constrain all risk behaviors. As Jessor suggested in the PBT, the two categories of risk behaviors did indeed function as a constraint on the Protection behaviors in my study's results.

Contradicting the PBT's assumption that the occurrence of any one risk behavior increases the likelihood of occurrence of other problem behaviors, my study's findings indicated that: (1) the adolescents' tendency toward High Action behaviors decreased their disposition toward Addiction behavior; and (2) adolescents' tendency toward Addiction behaviors did not affect their predisposition toward High Action behaviors.

The influence of interactions among the categories of High Action, Addiction, and Protection on the relationships between each pair of these categories was in accord with Jessor's (1987) identification of the groups of variables as *systems* that related to the dynamic of the interrelations between variables in each system namely, proneness. Proneness determines the adolescents' behavioral predisposition in favor of normative or problem behaviors.

My study's findings in regards to the influence of religiosity and school performance on assault-injury likelihood were consistent with the PBT's assumptions, but the relationship between assault-injury and the Protection, as a whole category, contradicted Jessor's assumption of the constraining influence of protective behaviors on the likelihood of risk behaviors. The relationships between school performance and the adolescents' tendency toward Protection behaviors also contradicted the PBT's assumptions; in my study, lower school performance was significantly correlated with an increase in the adolescents' predisposition toward engagement in further Protection behaviors. Conversely, my study's results about the relationship between assault-injury and the two risk categories (High Action and Addiction) were parallel to Jessor's assumption that adolescents' engagement in one risk behavior increases the likelihood of engagement in other risk behaviors.

The Study Results and Røysamb et al.'s (1997) Multidimensional Model

The construct of Røysamb et al.'s (1997) multidimensional model did explain the underlying structure of youth assault-injury among my study's variables of high action, addiction, and protection variables while controlling for age, sex, race, and SES. The additional paths between latent factors and indicator variables in the recursive and non-recursive models and the reciprocal paths between the latent factors in the non-recursive model were appropriate for two reasons: I used a dataset that differed from Røysamb et al.'s dataset, and I altered the set of variables that Røysamb et al. used in their model. Studies in which researchers examined American youth assault-injury by using multidimensional structures were missing in the literature.

This study's findings illustrated that the construct of Røysamb et al.'s multidimensional model was appropriate to explain the youth assault-injury underlying structure composed of a second-level of three latent factors and first-order level of 22 risk and protection variables while controlling for age, sex, race, and SES. I replaced

Røysamb et al.'s third-order level of *Health Enhancing versus Health Threatening behaviors* pole with assault-injury that included a value of 0 for no assault-injury and values of 1 and greater for the occurrence of one or more assault-injuries in the past year. The construct of the models in my study included additional paths missing in Røysamb et al.'s model. These paths were between High Action and the variables of risk behavior while intoxicated and wearing a seat belt, and between Addiction and the variables of delinquency, risky sexual behavior, and religiosity. The SEM test statistics results illustrated that these paths were all statistically significantly nonzero and that each of the former indicator variables was a statistically significant predictor of the relevant factor. I eliminated the path between physical activity and High Action in Røysamb et al.'s model, since, for my study's dataset, physical activity had marginal value on High Action.

Although the Addiction category included 10 addiction-related variables, the additional paths between Addiction and delinquency, risky sexual behavior, and religiosity rendered the name of the factor inadequate. It may be appropriate to rename the former factor as *Addiction, Delinquency, Risky Sex, and Religiosity* and to rename the High Action as *High Risk Behaviors*. In both the recursive and nonrecursive model, the Protection category did not have protection effects on youth assault-injury likelihood. The Protection category, however, had a protection effect on High Action in the nonrecursive model. It may be appropriate to rename this category as *NonRisky Behaviors*. However, since LISREL does not allow more than eight characters for each variable's name, I retained the factors' original names.

Finally, the reciprocal paths between each pair of the latent factors were missing in Røysamb et al.'s (1997) multidimensional model. These paths influenced all the relationships in the nonrecursive model; the relationships in the recursive model did not include interactions among the latent factors.

Youth Assault-Injury and the Indicator Variables

Research in which authors examined the underlying structure of youth assault-injury using multi-dimensional models was absent in the literature I reviewed. Research was also lacking in the mediation effects of the adolescent predisposition toward High Action, Addiction, and Protection behaviors on youth assault injury as well as its associations with risk and protective behaviors. In my literature review, I found no studies in which authors examined the influence of the interaction among the categories of High Action, Addiction, and Protection on youth assault-injury and its relationships with risk and protection behaviors. My study’s findings are evidence of the mediating effects of High Action, Addiction, and Protection on youth assault-injury and its associations with the study’s indicator variables. When the second-order level categories of High Action, Addiction, and Protection interacted, they further influenced the relationships between assault-injury and these categories as well as the relationships between assault-injury and the indicator variables. My study's findings were more likely to be significant for two reasons. First, the significance level of test statistics was .01, which decreased the probability of rejecting a true null hypothesis (i.e., type I error was less likely to occur). Second, the power of the statistical test was $1\text{-}\beta = .99$, which in turn increased the probability of rejecting a false null hypothesis (i.e., the type II error was less likely to occur; Trochim, 2006).

In most of the studies I reviewed in Chapter 2, researchers embedded assault-injury among nonphysically aggressive behaviors in violence measures or combined assault-injury with suicide and/or unintentional injury in youth injury measures (Bernat et al., 2012; de Looze et al., 2011; Linakis et al., 2009; Loh et al., 2010; Moon et al., 2010; Salas-Wright et al., 2012; Walsh et al, 2013). In the infrequent studies on youth assault-injury, authors focused on a limited number of variables (Cunningham et al., 2011; Dukes et al., 2010; Henry et al., 2012; Ranney et al., 2011; Wiebe et al., 2011). Most such studies suffered from various limitations, such as the lack of randomization, oversampling of particular minority or sex groups, small sample size, and the inclusion of a limited number of risk factors (Cheng et al., 2006; Cunningham et al., 2011; Murphy et al., 2010).

I based my analysis and interpretation of my study's findings in regard to assault-injury association with each indicator variables upon the results of the total effect that is LISREL estimate of a theoretical path that connects the third-order level variable of assault-injury with the first-order level indicator variable excluding the mediating effects of the relevant unobserved factors at the second-order level with all things in the model being unchanged in their original values. I also based my interpretation upon the overall significance of the structural association, which went through paths with more than one segment. As an illustration, in the recursive model, when an indicator variable was connected to one latent factor, the correlation between assault-injury and such an indicator variable had a two-segment path: a segment from the indicator variable to the second-order factor and a segment from the second-order factor to assault-injury. For instance, the path between assault-injury and aggression was assault-injury → High Action → aggression. The correlation between assault-injury and indicator variables, which were connected to two latent factors, had two two-segment paths with each of these variables. For instance, the paths between assault-injury and religiosity were assault-injury → Addiction → religiosity and assault-injury → Protection → religiosity (see Figure 4).

In the nonrecursive model, the association between assault-injury and each indicator variable had multi-segment and two-segment paths. As an example, in the nonrecursive model, the paths between assault-injury and aggression included assault-injury → High Action → aggression and other multi-segment paths such as assault-injury → High Action → Protection → High Action → aggression, assault-injury → High Action → Addiction → Protection → Addiction → High Action → aggression, and assault-injury → High Action → Protection →Addiction → High Action → aggression. For the indicator variables that were correlated to two latent factors, the association between assault-injury and such an indicator variable included two, two-segment paths and two sets of multisegment paths (see Figure 6). As I noted earlier, studies wherein authors examined the association between assault-injury and risk and protection behaviors using multidimensional structures were missing in the literature.

Therefore, my discussion of my study’s findings against the available knowledge in regard to the associations between assault-injury and indicator variables, in the following sections, was based on the overall significance of the paths that connected assault-injury with each indicator variable and upon the results of the total effect of assault-injury on each indicator variable.

High Action Behaviors

In my study, in both models, the high action behaviors correlated with assault-injury through the latent unobserved factor: High Action. In both models, two of these variables (i.e., delinquency and risky sexual behavior) were also correlated with assault injury through the latent unobserved factor: Addiction. The High Action (i.e., the adolescent's predisposition toward engagement in High Action behaviors) was statistical significant predictor of assault-injury (again, in both models).

It is noteworthy that when the latent unobserved factors in the nonrecursive model interacted, the correlation between assault-injury and High Action became relatively small. Specifically, in the recursive model, with all other things in the model being unchanged, an increase of .45 units of the adolescent's report of assault-injury incidence in the past year was correlated to a one unit increase in High Action ($\gamma_{injury\ High\ Action}$ = .45, *SE* = .010, *t* (12621) = 45.440, *p* <.01, two-tailed). In the non-recursive model, with all other things in the model being unchanged, a .05 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated with a one unit increase in his/her tendency to engage in High Action behaviors ($\gamma_{injury\ High\ Action}$ = .05, *SE* = .003, *t* (12621) = 15.56, *p* <.01).

The reduction in the correlation between assault-injury and High Action that resulted from the interaction among the latent factors indicated that such interaction influenced the effects of the adolescent's tendency to engagement in High Action behaviors on the likelihood of adolescent assault-injury. In other words, the same unit increase in High Action resulted in relatively smaller increase in the adolescent's report of assault-injury incidence in the past year when latent factors interacted.

The correlations between each indicator variable and High Action became relatively greater when the latent factors interacted. For instance, in the nonrecursive model, with all things in the model being unchanged, a 4.12 units increase in the adolescent's tendency toward engagement in High Action behaviors was correlated with a one unit difference in his/her report of engagement in aggression behavior(s) in the past year ($\lambda_{aggression}\ x_{High\ Action} = 4.12$, $p < .01$). While, in the recursive model, a .94 unit increase in High Action was correlated with a one unit increase in the adolescent report of engagement in aggression behavior(s) in the past year ($\lambda_{aggression}\ x_{High\ Action} = .94$, $p < .01$). The influences of all indicator variables on High Action and the influence of the later on assault-injury remained statistically significant in both models.

The relatively greater correlations between indicator variables and High Action and the relatively smaller correlation between the later and assault-injury indicated that, when the categories of High Action, Addiction, and Protection interacted, the adolescent's engagement in any high action behavior became: (1) more influential on his/her predisposition toward engagement in further High Action behavior and; (2) less influential on the adolescent's report of assault-injury incidence in the past year.

The reduction in the influence of High Action on assault-injury resulted from three issues. First, the indirect effects of the interaction among latent factors negatively influenced High Action. Second, the adolescent's predisposition toward engagement in Protection behaviors negatively affected his/her predisposition toward engagement in High Action behaviors. Third, the adolescent's predisposition toward engagement in Addiction behaviors also negatively influenced his/her predisposition toward engagement in High Action behaviors. I discussed in details my study's findings about the indicator variables of High Action against the avaiable literature in the following.

Weapon carrying and/or use. In the literature I reviewed in Chapter 2, the co-occurrence and the mutual associations between weapon carrying and/or use and youth assault-injury were apparent in relevant studies. Consistently, in such studies, authors noted statistically significant associations between both variables, regardless of which was the predictor or the outcome (Cheng et al., 2006; Cunningham et al., 2011; Thurnherr et al., 2009). For example, when intentional injury was the outcome, Cunningham et al. (2011) reported that weapon carrying increased the intentional injury likelihood 2.31 times. Thurnherr et al. (2009) examined the characteristics of adolescents who carried weapons, these who did not, and these who used the weapon in a fight. On a stratified random sample of 7,548 Swiss adolescents, Thurnherr et al. analyzed an array of risk factors and behaviors for the three groups on three levels: school, family, and individual, which included problem behaviors (e.g., physical violence victimization history). Thurnherr et al. noted that having been a victim of physical violence was a statistically significant predictor for weapon carrying among both males and females. Thurnherr et al. noted that having being a victim of physical violence in the past year did not predict weapon use in a fight.

Consistent with the results of previous studies, my study’s findings (i.e., the total effect of assault-injury on weapon carrying and use and the overall significance of the two-segment and multisegment paths between the two variables in both models) illustrated that an increase in the frequency of the adolescent’s weapon carrying and use in the past year was associated with an increase in assault-injury scores in both the recursive and nonrecursive models. The increase in the frequency of adolescents weapon carrying and use in the past year was associated with an increase in the adolescents' predisposition toward High Action behavior. In other words, in my study, adolescents who carried and/or used weapons in the past year tended to engage in additional High Action behaviors and had higher frequency of various assault-injuries in the past year.

Delinquency. In previous research, delinquency in early adolescence did not predict physical assault in late adolescence for males and females (Morash & Stevens, 2010). In the literature I reviewed, research was lacking on the co-occurrence of delinquency and assault-injury. Authors with a focus on violence, which included assault-injury in the violence measures, reported inconsistent associations between delinquency and youth violence (Henry et al., 2010; Lin et al., 2011; López & Emler, 2011; Sullivan et al., 2006).

My study’s findings (i.e., the total effect of assault-injury on delinquency and the overall significance of the two-segment and multisegment paths between the two variables in both models) illustrated an association between delinquency and assault-injury. Based on my study’s findings, an increase in the frequency of adolescents’ engagement in various delinquent behaviors in the past year was correlated with an increase in their past year assault-injury scores. Youth who engaged in frequent and various delinquent behaviors in the past year also tended to engage in further High Action and Addiction behaviors.

Risky sexual behavior. In the literature I reviewed, researchers did not examine the relationship between risky sexual behavior and youth assault-injury. In studies wherein researchers focused on the problem behavior syndrome, they observed relationships between adolescents' membership in groups of various, but not all, levels of violence, and various, but not all, risky sexual behaviors (Childs, 2014; Sullivan et al., 2010).

In my study, the variable of risky sexual behavior was the sum score of values from four items (see Tables 1 and 2). The *legitimate skip* in Item H2CO9 included the following: the respondent age <15 year-olds, never had sexual intercourse, used a condom in most recent intercourse, most recent intercourse was earlier than 12 months, used a condom the first time had sex, and *refused* and *don't know* in all the former questions. In Item H2CO10, the *legitimate skip* included the same values plus the values *No* in H2CO9. The *legitimate skip* in Item H2CO11 also included respondent age <15 year-olds, never had sexual intercourse, most recent intercourse was earlier than 12 months, and *refused* and *don't know* in all the former items. In Question H2NR8, the *legitimate skip* included respondents who reported not having sexual relationships with anyone other than one romantic partner. I recoded these items into three categories: 0 for legitimate skip, 1 for never or less than always use of a condom or contraceptives and having multiple partners, and 2 for always using condom and/or contraceptives and having only one romantic partner.

Accordingly, in the items that composed the variable of risky sexual behavior, the value of zero indicated that the respondent was age <15 year-old, never had sexual intercourse, most recent intercourse was earlier than 12 months ago, and *legitimate skip* and *don't know*. The value of 1 indicated that the adolescent infrequently used a condom or contraceptive or had more than one partner. The value of 2 indicated that the adolescent always used a condom or contraceptive or had only one romantic partner. Consequently, higher scores in this variable denoted safer sexual behavior. My study's findings illustrated statistically significant relationships between an increase in safe sexual behaviors scores and an increase in assault-injury scores and in the adolescents' predisposition toward Addiction and High Action behaviors. Adolescents who had higher scores of *safer sex* tended to have higher scores of past year assault-injury and to engage in further addiction and high action behaviors.

Although my study's findings (i.e., the total effect of assault-injury on risky sexual behavior and the overall significance of the two-segment and multisegment paths between the two variables in both models) provided evidence of association between the likelihood of assault-injury and an increase in safe sexual behavior, only a score of 8 in the variable of risky sexual behavior reflected scores of 2 on all the items that composed this variable (i.e., adolescent always used a condom and/or contraceptive and had only one romantic partner). All other values indicated risky sexual behavior on at least one of the items.

Moreover, the 0 value included age <15 year-olds. Accordingly, the values greater than 0 were concentrated on 15 to 18 year-olds. This age category may have influenced my study's findings, since in relevant research, authors illustrated correlations between older age and adolescents' intentional injury. For instance, Freed et al. (2004) conducted a retrospective study using 1992 to 1999 data from a major trauma center in Washington, DC. Their study sample included 2,191 patients 18 years and younger who presented to the trauma center with weapon-related injury. Statistically, they found a significant increase in the gunshot and stabbing wounds starting at age 14, and noted that the risk of gunshot and stabbing wounds continued to rise sharply until age 18. Freed et al. reported an increase in assault-injury at age 15, and subsequent increases at age 16 and then at age 17.

Aggression. In the literature I reviewed in Chapter 2, the most persistent predictor of assault-injury was the history of violence including assault-injury (Ranney et al., 2011; Wiebe et al., 2011). Wiebe et al. (2011) followed 95 adolescents who presented to an urban university ED with interpersonal (excluding romantic partner) acute assault-injury for eight weeks. Wiebe et al. indicated that within eight weeks from the hospital discharge, 18.2% of the adolescents reported being beaten up by someone and 20.7% beating someone. From the follow-up, Wiebe et al. stated that 2.9% reported being injured by a weapon, 2.9% reported injuring someone with a weapon, and 12.9% were injured in a fight.

Ranney et al. (2011) noted that 84.2% of the acute assault-injured adolescents presenting in the ED reported aggression against peers in the past 12 months. Ranney et al. found that among the 190 adolescents with assault-injury, 55.8% reported past year assault-injury excluding the last visit to the ED. Cheng et al. (2006) also noted that almost half the adolescents who presented at the ED with assault-injury reported two or more fights in the past 12 months. Cheng et al. found that 45% of the assault-injured youths had a history of violence perpetration.

Dukes et al. (2010) examined the concurrent associations of direct/physical aggression (physical bullying and physical victimization) and indirect/behavioral aggression (relational bullying and relational victimization) with assault-injury and weapon carrying among adolescents in a Colorado school district. Dukes et al. reported a statistically significant correlation between the frequency of physical victimization and the frequency of assault-injury controlling for grades at school. Dukes et al. also found that the higher rate of relational aggression independently predicted greater frequency of assault-injury and that this association was similar for boys and girls. Also similar for adolescent boys and girls, Dukes et al. found a small, but statistically significant correlation between relational victimization and assault-injury.

The finding of my study (i.e., the total effect of assault-injury on aggression and the overall significance of the two-segment and multisegment paths between the two variables in both models) confirmed previous research results about the associations between assault-injury and aggression. Increased frequency of adolescents' engagement in aggressive behaviors (physical fights) showed a significant increase in the frequency of their assault-injury scores in the past year. Adolescents who frequently engaged in aggressive behaviors (physical fights) also tended to have an increase in their engagement in further High Action behaviors.

Addiction Behaviors

In my study, the addiction behaviors correlated with assault-injury through the latent unobserved factor: Addiction in the recursive and nonrecursive models. One of these variables (i.e., risky behavior intoxicated) was also correlated with High Action in both models. The Addiction (i.e., the adolescent's tendency toward engagement in Addiction behaviors) was statistical significant predictor of assault-injury (again, in both models).

When the latent unobserved factors in the nonrecursive model interacted, the magnitude of the path coefficient between assault-injury and Addiction became slightly higher in the nonrecursive model compared to the same path coefficient in the recursive model. Explicitly, in the nonrecursive model, with all other things in the model being unchanged, an increase of .15 units of the adolescent's report of assault-injury incidence in the past year was correlated to a one unit increase in Addiction $\gamma_{injury\ Addiction} = .153$, $SE = .004$, $t\ (12621) = 32.15$, $p < .01$, two-tailed). In the recursive model, with all other things in the model being unchanged, a .10 unit increase in the adolescent's report of assault-injury incidence in the past year was statistically significantly correlated with a one unit increase in his/her tendency to engage in Addiction behaviors ($\gamma_{injury\ Addiction} = .097$, $SE = .003$, $t\ (12621) = 28.340$, $p < .01$). The increase in the correlation between assault-injury and Addiction that resulted from the interaction among the latent factors indicated that such interaction influenced the effects of the adolescent's tendency toward engagement in Addiction behaviors on the likelihood of adolescent assault-injury. In other words, the same unit increase in Addiction resulted in relatively greater increase in the adolescent's report of assault-injury incidence in the past year when latent factors interacted.

The correlations between each indicator variable and Addiction remained relatively the same when the latent factors interacted. For instance, in the nonrecursive model, with all things in the model being unchanged, a 1.22 units change in the adolescent's tendency toward engagement in Addiction behavior was correlated with the adolescent's report of using marijuana in the past year ($\lambda_{marijuana\ x\ Addiction}$ = 1.222, p <.01). In the same model, a 6.08 units difference in the adolescent's tendency toward engagement in Addiction behaviors was correlated with a one unit increase in her/his report of alcohol misuse and problem drinking in the past year ($\lambda_{alcohol\ misuse\ x\ Addiction}$ = 6.081, p <.01). In the recursive model, with all things in the model being unchanged, a 1.23 unit increase in Addiction was correlated with the adolescent's report of using marijuana in the past year ($\lambda_{marijuana\ x\ Addiction}$ = 1.226, p <.01); at the same time, a 5.87 units difference in the adolescent's tendency toward engagement in Addiction behaviors was correlated with a one unit increase in her/his report of alcohol misuse and problem drinking in the past year ($\lambda_{alcohol\ misuse\ x\ Addiction}$ = 5.872, p <.01). In other words, the adolescent's report of any Addiction behavior in the past year was correlated with relatively similar tendency to engage in further Addiction behaviors, either latent factors interacted or not. The influences of all indicator variables on Addiction and the influence of the later on assault-injury were statistically significant in both models.

The relatively similar correlations between indicator variables and Addiction and the relatively greater correlation between the later and assault-injury indicated that the interaction among categories of High Action, Addiction, and Protection: (1) did not influence the relationships between each indicator variables and the adolescent's tendency toward Addiction behaviors and; (2) resulted in greater influence of the adolescent's predisposition towared Addiction behaviors on her/his report of assault-injury incidence in the past year.

The increase in the effects of Addiction on assault-injury resulted from three issues. First, the adolescent's predisposition toward engagement in Protection behaviors positively affected his/her predisposition toward engagement in Addiction behaviors. Second, the adolescent's predisposition toward engagement in High Action behaviors negatively influenced his/her predisposition toward engagement in Addiction behaviors. Third, the indirect effects of the interaction among latent factors negatively influenced the adolescent's tendency toward engagement in Addiction behaviors. The overall effects of interactions resulted in relatively greater influence of Addction on assault-injury likelihood. In the following I discussed the relationships between assault-injury and each of the indicator variables of Addiction against the available knowledge.

Cigarette smoking. In Chapter 2, I reviewed two studies in which researchers focused on youth assault-injury and examined its relationship with cigarette smoking. In the bivariate analysis, Cunningham et al. (2011) reported a statistically significant association between cigarette smoking and intentional injury compared to no-injury. Cunningham et al. noted that this relationship lost its significance in the multinomial regression analysis. Conversely, Ranney et al. (2011) described the characteristics of adolescents presenting to the ED with acute assault-injury, and they noted high rates of cigarette smoking in the past year among the male (38.1%) and female (34.4%) assault-injured adolescents.

My study's findings (i.e., the total effect of assault-injury on weapon carrying and use and the overall significance of the two-segment and multisegment paths between the two variables in both models) contradicted Cunningham et al.'s (2011) results, but were consistent with Ranney et al.'s (2011) results. Adolescents who regularly smoked cigarette (at least one cigarette a day) for 30 days in the past year had significantly higher assault-injury scores and were significantly more likely to be engaged in additional Addiction behaviors.

Use of various illicit drugs. The literature I reviewed reflected an apparent ambiguity in regard to association between drug use and youth assault-injury. The first reason for this uncertainty was that authors frequently combined smoking, alcohol, and marijuana, and occasionally hard drug use in the single variable of substance use (Sussman et al., 2004; Walton et al., 2009). The second reason was that other authors combined various illicit drugs in one measure (Buckley et al., 2012; Rudatsikira, 2008). In studies where researchers utilized the joint substance use variables, many authors not only overlooked drug use frequency, but also dichotomized the responses to user and non-user, which might have led to incorrect interpretations of the associations between the use of different drugs and youth assault-injury (Henry et al., 2012; Mercado-Crespo et al., 2013; Sheppard et al., 2008). The third reason was that in relevant studies, researchers illustrated an inconsistent relationship between the most-assessed drug, marijuana, and youth assault-injury (Mercado-Crespo et al., 2013; Sullivan et al., 2006). Further complicating the assessments of the relationship between drug use and youth assault-injury was the authors' inclusion of assault-injury with other violent behaviors, which might not result in injury, in a single variable (Walton et al., 2009; White et al., 2013). In the literature I reviewed, there were no studies in which researchers examined the correlations between the use of various illicit drugs, excluding marijuana, and youth assault-injury.

Marijuana use. For the marijuana use variable, I found only one study in which researchers distinguished cigarette smoking, marijuana use, and alcohol use in their examination of the youth intentional injury risk factors (Cunningham et al., 2011). In the bivariate analysis, Cunningham et al. reported a statistically significant association between marijuana use and intentional injury compared to no-injury. Cunningham et al. noted that this relationship lost its significance in the multinomial regression analysis. Inversely, in my study results (i.e., the total effect of assault-injury on marijuana use and the overall significance of the two-segment and multisegment paths between the two variables in both models), marijuana use in the past year was significantly associated with an increase in the adolescents’ disposition toward Addiction and in their assault-injury scores in the past year.

Various illicit drugs use. My study appears to be the first to examine the associations between assault-injury likelihood and the use of different illicit drugs. Its findings (i.e., the total effect of assault-injury on each illicit drug use and the overall significance of the two-segment and multisegment paths between the two variables in both models) illustrated that adolescents who used cocaine in the past year had statistically significant increases in their assault-injury scores. Adolescents who used inhalants (i.e., glue or solvents) in the past year also had statistically significant increases in their assault-injury scores. Using any drugs such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, or pills without a doctor’s prescription was associated with an increase in the adolescents' assault-injury scores in the past year. Injection of any illegal drug (i.e., heroin or cocaine) in the past year was associated with an increase in adolescents' assault-injury scores. Adolescents who used any of the former illicit drugs were significantly more likely to engage in other addiction behaviors.

Alcohol use and problem drinking. Studies in which researchers illustrated correlations between alcohol misuse and youth assault-injury were abundant in the literature (Cunningham et al., 2011; Murphy et al., 2010). In Chapter 2, I reviewed four such studies. Linakis et al. (2009) utilized a nationally representative sample for 13- to 20-year-olds who visited EDs from 2001 to 2004. Linakis et al. categorized injuries as self-inflicted, assault, or unintentional and combined assault and self-inflicted injuries in the intentional injury variable. In their retrospective cross-sectional study, Linakis et al. examined the relationships between the adolescents' alcohol use and their injury-related visits to ED. They noted that injuries were significantly more likely to be intentional for alcohol-related visits compared to non-alcohol-related visits. Linakis et al.'s study was not free of limitations.

Linakis et al. (2009) discussed the study limitations, which included the differences between coders in classifying alcohol use and the absence of medical measures for alcohol misuse (e.g., binge drinking). The combination by Linakis et al. of assault and self-inflicted injuries in the intentional injury variable might be misleading because of the differences in the characteristics and the risk factors between self-harmful and violent adolescents (Nock et al., 2009; Nock et al., 2006). Accordingly, the influence of Linakis et al.'s combination of self-inflicted and assault-injury on the study results is unclear. Linakis et al.'s research findings remained consistent with other authors' results illustrating the statistically significant association between alcohol misuse and youth assault-injury (Cunningham et al., 2011; Swahn et al., 2004; Sullivan et al., 2010).

Cunningham et al. (2011) examined the injury risk factors, among 14- to 18-year-olds presenting to an ED between September 2007 and September 2008 (*n* = 1,128). Cunningham et al. assessed the alcohol use frequency and quantity using items from the AUDIT, which included questions of the past year daily frequency of alcohol use and the frequency of drinking five or more drinks on one occasion. Cunningham et al. stated that 768 respondent reported injuries and that the non-injured group was a reference for all statistical tests. Cunningham et al. noted the statistically significant 1.94 times increase of the likelihood of intentional injury with binge drinking. Swahn et al. (2004) also reported higher likelihood of fighting, assault-injury, and injuring others among respondents who reported binge drinking, problem drinking, peer drinking, and recurrent drinking compared with these who did not report these patterns.

Similarly, Murphy et al. (2010) examined the relationship between alcohol use and psychological distress and the violent intentional injury among 67 youths who presented with facial injuries at two urban trauma centers in Los Angeles. Murphy et al. reported statistically significant differences in the mean AUDIT scores among three injury groups: adolescents with unintentional injury, those with one type of intentional injury (either from fighting or from being attacked), and those with both types of intentional injury. They noted that the group that experienced both types of violent injuries had the higher AUDIT score.

In regard to the association of alcohol misuse and problem drinking with assault-injury, my study's findings (i.e., the total effect of assault-injury on alcohol misuse and problem drinking and the overall significance of the two-segment and multisegment paths between the two variables in both models) were consistent with the results of previous studies. Adolescents who showed an increase in the frequency of alcohol misuse and problem drinking scores had a statistically significant increase in their assault-injury scores in the past year. These adolescents also showed an increase in their predisposition toward Addiction behaviors.

Driving drunk and driving high on drugs. In the literature I reviewed, authors focusing on youth assault-injury did not integrate driving while intoxicated with youth assault-injury risk factors. In Chapter 2, I reviewed a study in which authors included risky driving with other risk factors. In this study, researchers embedded driving while intoxicated with other risky driving behaviors (e.g., a joyride or riding a motorbike on the road) in a single variable, and then combined intentional and unintentional injury in another variable (Buckley et al., 2012). In their study, Buckley et al. reported a statistically significant correlation between risky driving and adolescents' injury.

Also discussed in my literature review in Chapter 2, Childs's (2014) study distinguished adolescents' groups according to the level of involvement in various problem behaviors. Childs reported relatively high mean percentages of driving while intoxicated among groups of adolescents who engaged in moderate and high problem behaviors. Researchers with a focus on youth violence included risky driving among the predictors, and then reported a statistically significant correlation between risky driving and violence (Logan-Greene et al., 2010). In such studies, in addition to assault-injury, the violence variable encompassed items of witnessing and experiencing different types of violence (e.g., sexual abuse). In previous studies on youth violence, researchers did not examine the correlation between driving while intoxicated and youth assault-injury per se. Therefore, the results of such studies, though many are statistically significant, might not be sufficient to establish an evident relationship between driving while intoxicated and youth-assault-injury.

In the current study, adolescents who reported driving drunk showed a statistically significant increase in their assault-injury scores in the past year. They also tended to engage in further addiction behaviors. My study's findings (i.e., the total effect of assault-injury on driving while high on drugs and the overall significance of the two-segment and multisegment paths between the two variables in both models) also illustrated correlations between driving while high on drugs and an increase in assault-injury scores in the last year. Adolescents who drove while high on drugs in the past year tended to engage in additional addiction behaviors.

Risk behavior while intoxicated. In youth assault-injury research, authors illustrated statistically significant correlations between fighting while intoxicated and assault-injury. For instance, from the data of a national representative sample of adolescents presenting to EDs, Linakis et al. (2009) found that injuries were significantly more likely to be intentional for alcohol-related visits compared to non-alcohol-related visits. Sheppard et al. (2008) estimated the percentages of alcohol and drug involvement at the time of the assault-injury incidence. Using the Maryland Trauma registry data of 2,189 adolescents, Sheppard et al. reported the actual percentages of alcohol and/or drug occurrence, which varied from 62% to 72% among assault-injured youths with known alcohol and/or drug involvement. They estimated this occurrence among adolescents with unknown alcohol and/or drug use to be from 54% to 66%. Researchers who examined the alcohol-related fighting risk factors illustrated statistically significant associations among problem drinking, marijuana use, and fighting while intoxicated (Kodjo, Auinger, & Ryan, 2004; Swahn & Donovan, 2006; Walton et al., 2009).

Researchers also reported statistically significant correlations among having sexual intercourse while intoxicated, violence, and carrying weapons. Walton et al. (2011) examined correlates among risky sexual behavior, other problem behaviors (e.g. violence, school failure, and carrying a weapon), and demographics. They collected data from 14 to 18- year-olds presenting to an ED in an urban area. Among sexually active youth who composed 60% of the 1,576 cases in the sample, Walton et al. reported a statistically significant correlation between having sexual intercourse while intoxicated and peer violence and carrying weapons. In the literature I reviewed, researchers did not examine the relationship between having sex while intoxicated and youth assault-injury.

The findings of my study (i.e., the total effect of assault-injury on risk behavior intoxicated and the overall significance of the two-segment and multisegment paths between the two variables in both models) confirmed previous research results in regard to the correlations between assault-injury and risk behavior while intoxicated. In my study, adolescents who reported one or more risk behaviors while intoxicated (i.e., drank alcohol while carrying a weapon, used drugs while carrying a weapon, got into a physical fight because they have been drinking, the most recent time they got into a fight they had been drinking or were drunk, they had been drunk when they had sexual intercourse most recently, they had been using drugs when they had sexual intercourse, and/or they had gotten into a fight when they had been using drugs) in the past year showed a statistically significant increase in their assault-injury scores in the past 12 months. They also had an increased predisposition toward addiction behaviors.

Protection Behaviors

The Protection behaviors, in the recursive and nonrecursive models, correlated with assault-injury through the latent unobserved factor: Protection. At the same time, in both models, the variable of religiosity was also correlated with assault-injury through Addiction and the variable of wearing a seat belt was correlated with assault-injury through High Action. The Protection (i.e., the adolescent's tendency toward engagement in Protection behaviors) was statistical significant predictor of assault-injury (again, in both models).

In the nonrecursive model, when the latent unobserved factors interacted, the magnitude of the path coefficient between assault-injury and Protection have not differ from the magnitude of the same path coefficient in the recursive model. Accordingly, the interaction among the latent factors did not influence the effects of the adolescent's tendency toward engagement in Protection behaviors on the likelihood of adolescent assault-injury. In other words, the same unit increase in Protection resulted in similar increase in the adolescent's report of assault-injury incidence in the past year, either the latent factors interacted or not.

The interaction among latent unobserved factors, in the nonrecursive model, influenced the effects of each indicator variable on Protection. This interaction also influenced the relationships between religiosity and Addiction and wearing a seat belt and High Action (these two variables were indicators of Protection and were correlated with the other factors). When latent factors interacted, some of the indicator variables that had risk effect on the adolescent's disposition toward Protection in the recursive model, became protection behaviors (i.e., were correlated with increases in the adolescent's tendency toward Protection) and vice versa. Other indicator variables had the same effect in both models, but the magnitude of such effect became relatively smaller due to the latent factors interaction. In my study, the adolescent's overall predisposition (i.e., the results of the latent factors interaction) toward High Action, Addiction, and Protection changed the *role* of protection variables. In other words, the interaction among High

Action, Addiction, and Protection changed the variable's *role*, whether a risk or a protection, in influencing the adolescent's disposition toward engagement in further Protection behaviors. Because each of the Protection indicator variables had a different *attitude* in each model, I included my interpretation of the results in regard to the relationship between such a variable with latent factor and with assault-injury in the variables discussion sections.

Three issues had influence on the adolescent's predisposition toward engagement in further Protection behaviors. First, the adolescent's predisposition toward engagement in Addiction behaviors negatively affected his/her predisposition toward engagement in Protection behaviors. Second, the adolescent's predisposition toward engagement in High Action behaviors negatively influenced his/her predisposition toward engagement in Protection behaviors. Third, the indirect effects of the interaction among latent factors negatively influenced the adolescent's tendency toward engagement in Addiction behaviors. The overall effects of interactions resulted in no change in the influence of Protection on assault-injury likelihood.

Physical activity. In the research I reviewed, physical training appeared only in studies on youth violence, but not in studies in which researchers focused on youth-assault injury. Researchers illustrated contradictory results with regard to the relationship between physical activity and youth violence (Childs, 2014; Sullivan et al., 2010; Swahn & Donovan, 2004; 2006). Childs (2014) found that all levels of weekly physical exercise failed to be significant predictors of membership in any violent or nonviolent group compared with exercise five and more times a week controlling for age. Sullivan et al.

(2010) found that groups of high involvement in diverse problem behaviors had significant lower values of past month regular exercise compared with the nonviolent group. Swahn and Donovan (2004) noted that frequent physical exercise was a statistically significant risk factor for females violence in the cross-sectional data of Add Health Waves I and II compared to males violence, but did not predict future violence for either males or females (i.e., frequent physical exercise in Wave I did not predict violence in Wave II) . Moreover, Swahn and Donovan (2005) found a statistically significant association between weekly sports activity and alcohol-related fighting among White and Hispanic adolescents, but not among African American adolescents.

In my study, the interaction among latent factors, in the nonrecursive model, reduced the magnitude of the path coefficient between weekly physical activity and Protection that was relatively greater in the recursive model. In both models, an increase in the adolescent's report of higher frequency of weekly active sport was correlated with an increase in his/her tendency to engage in further Protective behaviors. In my study, the increase in adolescent's predisposition toward Protection behaviors was correlated with an increase in his/her report of higher frequency of assault-injury in the past year.

Contradicting the results of Childs' (2014) studies, and confirming, in part, the results of Swahn and Donovan's (2005; 2004) and Sullivan et al'. (2010) studies, I found a statistically significant association between the frequency of weekly physical activity and assault-injury. The total effect that is the LISREL estimate of a theoretical path that directly connects assault-injury with physical activity illustrated that, in the recursive model, adolescents who reported higher frequency of playing an active sport in the past week were more likely to report a higher frequency of assault-injury in the last year. Conversely, in the nonrecursive model, the interaction among latent factors resulted in statistically significant negative correlation between the two variables; an increase in the frequency of playing an active sport in the past week became associated with a decrease in the adolescent's report of frequency of assault-injury in the past year.

Healthy diet, dental hygiene, safety equipment use, and wearing a seat belt. In the literature I reviewed, researchers did not examine the relationship of proper diet, dental hygiene, using safety equipment, and wearing a seat belt with youth assault-injury. Authors focusing on the problem behavior syndrome who included healthy diet and dental hygiene with the protective factors illustrated no significant influence of these variables on the members of violent groups (León et al., 2010; Sullivan et al., 2010).

Healthy diet. In my study, in the nonrecursive model, with all variables and paths being unchanged, a .85 unit difference in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one unit increase in her/his report of consuming healthy food item in the past day ($\lambda_{healthy\ diet\ x\ Protection}$ = .847, p <.01). In the recursive model the magnitude of the relationship between healthy diet and Protection was relatively smaller: with all variables and paths being unchanged, a .33 unit change in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one unit difference in her/his report of consuming healthy food item in the past day ($\lambda_{healthy\ diet\ x\ Protection}$ = .334, p <.01). In both models, the increase in adolescent's predisposition toward Protection behaviors was correlated with an increase in his/her report of higher frequency of assault-injury in the past year.

In the recursive model, the total effect (LISREL estimate of a theoretical direct path between assault-injury and healthy diet) illustrated that healthy diet was positively correlated with assault-injury. But when latent factors interacted, healthy diet became negatively correlated with assault-injury; an increase of the adolescent's report of consuming additional healthy items in the last day was correlated with a decrease in his/her report of assault-injury in the past year.

It is noteworthy that the variable of healthy diet asked about the adolescent's food consumption in the last day. A one-day dietary habit is not sufficient to reflect the adolescent's actual consumption of healthy food. Therefore, the effect of healthy diet on assault-injury calls for further research wherein researchers examine the influence of the adolescent's actual dietary habits on assault-injury likelihood.

Dental hygiene. In my study, the dental hygiene correlations with Protection and thus assault-injury were problematic for two reasons. First, the variable of dental hygiene did not mirror actual dental hygiene; it included one item that asked whether the adolescent had a dental examination in the past year. Second, the value of the path coefficient between dental hygiene and Protection was statistically nonsignificant in the recursive model and became significant, but marginal ($\lambda = .11$) in the nonrecursive model. Accordingly, it remains unknown whether the association between dental hygiene and the category of Protection and thus assault-injury reflected an actual relationship or was attributable to the large sample size, such a size increases the chance of capturing statistically significant small effects even when they are not relevant (Grissom & Kim, 2012; Sullivan & Feinn, 2012).

Safety equipment use. For the variable of safety equipment use, in the literature I reviewed in chapter 2, in only one study did authors include wearing a helmet as a risk factor and report a significant association between the failure to wear a helmet and adolescents' injury (Buckley et al., 2012). Unfortunately, in this study Buckley et al. did not distinguish intentional from unintentional injury.

In the recursive model of my study, according to the total effect that is LISREL estimate of a theoretical path that connect assault-injury directly with safety equipment use, an increase in the adolescents' frequency of using safety equipment (wearing a bicycle helmet) was statistically significantly correlated with a decrease in their assault-injury scores and a decrease in their involvement in Protection behaviors. These results were consistent with the results of the nonrecursive model, wherein an increase in the adolescents' frequency of using safety equipment was statistically significantly correlated with a decrease in their assault-injury scores and a decrease in their involvement in Protection behaviors.

Wearing a seat belt. In my study, the relationship between the variable of wearing a seat belt and Protection was negative in the recursive model. Such relationship became positive in the nonrecursive model. As an illustration, in the recursive model, with all things in the model being unchanged, a -.49 units difference (decrease) in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one unit increase in his/her report of frequency of wearing a seat belt ($\lambda_{seatbelt}\ x_{\ Protection}$ = -.490, p <.01). In the nonrecursive model, 2.90 units difference (increase) in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one unit increase in his/her report of frequency of wearing a seat belt ($\lambda_{seatbelt}\, x_{\,Protection} = 2.904$, p <.01).

Conversely, wearing a seat belt was negatively correlated (i.e. had protection effects) with High Action in the recursive model. When latent factors interacted , in the non-recursive model, wearing a seat belt became positively correlated (i.e., had risk effects) with High Action.

Accordingly, the adolescent's overall tendency toward High Action, Addiction, and Protection (i.e., the latent factors interaction in the nonrecursive model) changed the influence of waering a seat belt on Protection from being a risk to being a protective behavior. At the same time, this overall tendency changed the influence of waering a seat belt on High Action from being a protection to being a risk behavior.

In my study, the total effect (i.e., LISREL calculation of a theoretical path coefficeints between the two variables with all other things in the model being unchanged) of assault-injury on wearing a seat belt were statsitically significantly nonzero and were negative in both models. Accordingly, higher frequency of wearing a seat belt was correlated with decreases in the adolescent's report of assault-injury scores in the past year.

Religiosity. Studies in which authors examined the relationship between religiosity and youth assault-injury were absent in the literature I reviewed. In Chapter 2, I reviewed a few studies in which authors did examine the relationship between religiosity and youth violence, and showed inconsistent correlations between these variables (Baier, 2014; Resnick et al., 2004; Salas-Wright et al., 2014; 2012). For instance, Salas-Wright et al. (2012) examined the associations between different levels of religious involvement and substance use, violence, and delinquency among 17,705 adolescents. Salas-Wright et al. measured violence by three variables: the adolescents' self-report of past year involvement in fights, in group fights, and in violent attacks. Salas-Wright et al. noted that the latent factor analysis resulted in five distinct religious involvement classes: disengagement, infrequent, private religion, regular, and devoted groups. Salas-Wright et al. reported statistically significant associations of the membership in the religiously devoted group and the religiously regular group with a decrease in past year engagement in fights compared with the disengaged group. Salas-Wright et al. noted that membership in the high involvement in private religion group, which does not entail public engagement in religious activities, did not influence problem behaviors. Accordingly, Salas-Wright et al. stated that the social norms and controls that accompany religiosity have a critical role in decreasing problem behaviors among youths. Wright et al.'s study results were inconsistent with other researchers' results.

Other researchers illustrated no association between religious-related activity on the one hand and youth violence and a statistically significant protective effect of the perceptions of religion as important on youth violence on the other hand. For instance, Sinha et al. (2007) studied the associations between religious activity and youth risk behaviors using a nationally representative sample of parents and adolescents. Sinha et al. used the perceptions of the importance of religion, participation in religious services, and involvement in faith-based activities as the religion core variables. Sinha et al. examined the relationships among these three variables and ten risk behaviors, including interpersonal violence (e.g., hit or threatened others) and weapon carrying. Sinha et al. noted only a statistically significant correlation between the perception of the importance of religion and a decrease in the likelihood of interpersonal violence. Sinha et al. pointed out that the church attendance and participation in faith-based groups did not decrease interpersonal violence.

In my study, in the recursive and nonrecursive model, religiosity (i.e., lower church attendance, involvement in church-related activity, daily prayers, and perception of religious as important) was positively correlated with Protection and Addiction. The interaction among latent factors relatively increased the magnitude of the path coefficeints between religiosity and both, Protection and Addiction. Specifically, in the nonrecursive model, with all variables and paths in the model being unchanged, a .65 unit change (increase) in the adolescent's tendency toward engagement in Protection behaviors was correlated with a one unit difference in her/his report of lower religiosity ($\lambda_{religiosity\ x\ Protection}$ = .646, p <.01); at the same time, a 1.31 unit change (increase) in the adolescent's tendency toward engagement in Addiction behaviors was correlated with one unit difference in her/his report of lower religiosity ($\lambda_{religiosity\ x\ Addiction}$ = 1.307, p <.01). In summary, lower religiosity was a risk for the adolescent's tendency to engage in Addiction behaviors. Simultaneously, lower religiosity was a protection behavior; it was correlated with an increase in the adolescent predisposition toward engagement in Protection behaviors.

My study's findings illustrated statistically significant associations between lower religiosity and increase in assault-injury scores. The total effects (i.e., LISREL calculation of a theoretical path coefficeint between the two variables with all other things in the model being unchanged) of religiosity on assault-injury were statsitically significantly nonzero and were positive in both models. Accordingly, adolescents who reported lower religiosity reported an increase in the assault-injury frequency in the past year.

School performance and school connectedness. In studies on youth assault-injury, researchers rarely included school performance, and so could illustrate no significant correlation between failing grades and youth intentional injury (Cunningham et al., 2011). Researchers with a focus on youth violence frequently used different concepts (e.g., grade average level, connectedness to school, and educational expectations) to examine the relationship between school performance and youth violence. In such studies, authors reported inconsistent relationships between school performance and youth violence. When authors did illustrate statistically significant correlations between the two variables, they found that school performance had bidirectional effects (risk and protection) on the likelihood of violence. Resnick et al. (2004) examined the risk and protective factors for future violence perpetration in a longitudinal study using data from 13,110 adolescents who participated in two waves of Add Health. Resnick et al. measured violence, which was the outcome variable, in the second wave, by items of past year fights, assault-injury, and weapon threats or use against others. They noted a statistically significant association between repeating a grade and future violence perpetration by males, controlling for demographics. Resnick et al. also noted statistically significant protective influence of the males' grade point average level and future violence perpetration. Resnick et al. stated that school connectedness and grade average level were statistically significant protective factors for the females' future violence perpetration. The results of the Resnick et al. study are consistent with those of Henry et al. (2012). Henry et al. found that among the protective factors, positive school achievement (the teachers' report of the adolescent's study skills) had a statistically significant protective effect on later violence, controlling for demographics and the interventions (schools were subject to three interventions and one control). Henry et al. noted that poor school achievement with negative study skills became a statistically significant risk factor for later violence.

Conversely, other authors found no association between school performance and youth violence. For instance, Bernat et al. (2012) utilized the data of Add Health Waves II and III. They measured violence by items that included hurting others, involvement in serious fights, and using a weapon in a fight. Bernat et al. examined a number of violence risk and protective factors, and they observed no associations between the grade-point average and attachment to school and future youth violence. Herrenkohl et al. (2012) reported that only the attachment to school at age 10 to 12 was a statistically significant protective factor for violence at age 13 to 14, controlling for sex, race, poverty, and individual factors. Herrenkohl et al. reported no significant associations between the school performance variables at age 10 to 12 and 13 to 14 and violence likelihood at age 15 to18 controlling for sex, race, poverty, and individual factors.

In my study, in regard to the relationships between school performance and Protection, the magnitude of the path coefficient became relatively smaller due to the interaction among the latent factors. In both models, school performance (i.e., lower grades scores) was correlated with increase in the adolescent's tendency toward engagement in Protection behaviors. Explicitly, in the nonrecursive model, with all variables and paths being unchanged, a .91 unit change (increase) in the adolescent's tendency toward engagement in Protection behaviors was correlated with one unit difference in her/his report of lower grades scores in the past year ($\lambda_{school\ performance\ x\ Protection}$ = .906, p <.01). while in the recursive model, with all variables and paths being unchanged, a 1.75 units difference (increase) in the adolescent's tendency toward engagement in Protection behaviors was correlated with one unit difference in her/his report of lower grades scores in the past year ($\lambda_{school\ performance\ x\ Protection}$ = 1.753, p <.01).

My study's findings illustrated statistically significant associations between decreases in school performance (lower grade level scores) and increases in the adolescent's youth assault-injury scores in both the recursive and nonrecursive models. The total effects of school performance on assault-injury were statsitically significantly non-zero and were positive in both models. Accordingly, adolescents who reported lower grades scores reported an increase in the assault-injury frequency in the past year.

For the variable of school connectedness (i.e., lower connectedness with school), in the recursive model, with all things in the model being unchanged, a .30 units increase in Protection was statistically significantly correlated with a one unit increase in the adolescent's report of lower school connectedness ($\lambda_{school\ connectedness}$ = .301, p <.01). In the non-recursive model, with all things in the model being unchanged, a -.26 units difference (decrease) in Protection was statistically significantly correlated with a one unit increase in the adolescent's report of lower school connectedness ($\lambda_{school\ connectedness}$ = -.259, *p* <.01).

The current study's findings illustrated contradictory results between the recursive and nonrecursive model. In the recursive model, the total effect of school connectedness on assault-injury was not statsitically significantly nonzero. When the latent factors interacted, in the nonrecursive model, this path became statsitically significantly nonzero. However, the effect was marginal (λ = .016, *SE* = .001, *t*(12621) = 13.442, *p*<.01, two-tailed). Accordingly, it is more likely that the effect of school connectedness on assault-injury was attributable to the interaction among latent factors or to the large sample rather than an actual relationship between the two variables (Grissom & Kim, 2012; Sullivan & Feinn, 2012).

Limitations of the Study

The cross-sectional survey design brought various limitations to the present study. The cross-sectional survey design allowed examining correlations, but not causation, among the study variables. The internal validity of such a design is weaker than designs with control or comparison groups (Creswell, 2013). Survey cross-sectional design does not allow determining the timing sequence of the relationships among variables. In other words, it remains unknown which occurred first, assault-injury or the indicator variables. Regardless of these limitations, the cross-sectional survey design was suitable for the present study since my aim was to examine interrelationships, but not causation, among variables that, according to the theoretical assumptions, co-occur in real world settings.

Despite the advantages of using secondary data, this use prevented me from acquiring additional experience in instrument development and data collection. Using secondary data also restricted the present study to the parent study's variables, instrument and measures, and data collection approach. For instance, I excluded the variable of speeding in cars because it was missing from the data set. Moreover, the variable of dental hygiene did not reflect the adolescents' daily dental hygiene conduct, because additional items to measure dental hygiene were missing. Using this one item threatened the validity and reliability of this measure and made interpreting the results about this variable highly questionable. The patterns of excluding respondents in the items that constructed the variable of risky sexual behavior resulted in concentrating the category 15 to 18 year-olds in the values that were higher than 0 and the category of 11 to15 year-olds in the 0 values of the variable items. The influence of grouping age categories on the study's findings in regard to the association among assault-injury, the three latent factors, and risky sexual behavior remains unknown.

For the variables in the present study, my estimate of Cronbach's alpha indicated good levels of internal consistency of the study's measures. My use of the sampling weight variables (Chen & Chantala, 2014) eliminated the sampling design effect on the parameter estimates and standard errors.

In addition to the lack of information about the instrument's convergent, discriminant, and concurrent validity, various factors also may have contributed to increasing the probability of inaccuracies of this study's data. The first factor was the likelihood of investigators and respondents' personal bias during in-person interviews.

Add Health researchers used a CSA audio CASI portion for the sensitive health and risk behavior questions. It was assumed that this approach might have minimized the influence of the interviewer on the adolescent's responses. The second factor was the incomplete development of the person’s cognitive system during adolescence. Adolescents' responses to sensitive questions relate to their level of maturity, their perception of behaviors either as risk or normative, and to their perception of consequences that may result from reporting these behaviors. The third factor was the potential recall bias in the data since, except for the questions on illicit drug use and diet, all questions about risk behaviors required a 12-month recall period.

The fourth factor was that the Add Health Wave II in-home survey was a follow-up of Wave I, with the same participants using almost identical questionnaires. In the Add Health website and related literature, information was lacking about the testing effects on Wave II responses. In addition to the above factors, social desirability and random measurement error may have influenced data accuracy. Since I used no other sources of data, it was hard to determine the extent to which the above factors influenced data accuracy. However, my large sample size n = 12,623 minimized the potential impact of the former factors on data accuracy and maximized data precision including the accuracy of parameter estimates and standard errors. Finally, response bias was less likely to affect study results because of the high response rate of 88.6% in Wave II.

LISREL did not allow calculating the variance of assault-injury. Accordingly, the amount of variance of the observed variables in both the recursive model and nonrecursive model remain unknown. Nor it allowed the calculation of the effect size of the interactions among latent factors through the reciprocal paths. Although, excluding the path between Addiction and High Action, all structural paths were statistically significantly nonzero; the actual effect sizes of these factors on each other remain unknown.

Although the present sample size, the statistical test significance and power levels, and the measures that I used maximized the data precision, the ability to generalize the present study results is highly questionable because of the data collection date and because gender, age, race, and SES influence the likelihood of youth assault-injury and its risk and protective factors (Cunningham et al., 2011; Melzer-Lange et al., 2007; Ranney et al., 2009; Simpson et al., 2005). Without further research, the applicability of the construct of the multidimensional model to current American adolescent groups of females and males, various races, different age categories, and varying socioeconomic levels remains unknown. Another limitation is my focus on the individual behavior system that entailed excluding the perceived environment and personality constructs that comprise the problem behavior theory. The proportion of youth assault-injury's variation that these two constructs may explain and the influence of their exclusion on the study results remain unknown and require further studies.

Recommendations

The current study was an attempt to examine youth assault-injury using an innovative approach that researchers have not used before. The approach had inherent weaknesses since it could not be based on sufficient scientific knowledge. It also had inherent strengths because it supplied a new perspective expanding the tools for understanding youth assault-injury in the United States.

My study's findings provided evidence of the multidimensionality of the youth assault-injury underlying structure that encompassed an array of risk and protective variables at the first-order level and three factors at the second-order level. Studies wherein researchers utilized such a perspective were missing in assault-injury literature. Therefore, further research is necessary to confirm, adjust, or dispute the current study's approach and results. My study's results showed evidence of the influence of the interactions among the second-order categories High Action, Addiction, and Protection on the relationships between each pair of these categories and on the likelihood of assault-injury. Further studies, in which researchers examine the structural interactions and their influence on assault-injury and on the assault-injured adolescents' predisposition to engagement in risk and protection behaviors, are necessary to provide further knowledge about such interaction and influence.

My study's findings contradicted various assumptions of the PBT. Examining risk behaviors in separate factors/categories of High Action and Addiction illustrated a complex array of interactions among the three factors of High Action, Addiction, and Protection. Few of these interactions illustrated important differences from the PBT assumptions. Further studies are essential to confirm or dispute these areas of disagreements.

My study was the first to examine, and to provide evidence of, correlations between assault-injury likelihood and various illicit drug use, risky sexual behavior, physical training, healthy diet, dental hygiene, using safety equipment, wearing a seat belt, religiosity, and school connectedness. Taking into account the study's findings that illustrated a concentration of older age adolescents in the positive scores of the variable of risky sexual behavior, further research is essential to confirm or dispute the association between assault-injury and risky sexual behavior. Finally, in my study, I utilized archival data that Add Health researchers collected between April and August 1996. Replicating the study, using the same approach, on current data is necessary to examine if the findings will hold for the adolescents living in 2015.

Implications

Increased knowledge gained from this study may contribute to expanding the behavior system of the problem behavior theory and its application to adolescents' assault-injury. For researchers, this study provided an innovative approach to examining, in depth, youth risk of assault-injury. My study also provided evidence of associations between youth assault-injury and various risk and protective behaviors; these behaviors were missing in research on youth assault-injury. Moreover, public health practitioners may use the results regarding the influence of interactions among categories of High Action, Addiction, and Protection as critical intervention and control areas for reducing youth assault-injury and its risk factors prevalence rates. Consequently, the present study might indirectly contribute to positive social change by decreasing the adolescents' morbidity, disability, and mortality. Taking into account the frequency of tragic events of weapon use on school properties in the United States and their adverse consequences on society and youth, this study's results may contribute to protecting the lives of youth in the United States. Positive social change could also result from directing youth energy toward success, by addressing the adolescents' violent behaviors. Supporting adolescent safety allows their active contribution in developing their lives and surroundings.

Conclusion

Despite its limitations, this study illustrated that examining and understanding a particular problem behavior (i.e., youth assault-injury) requires expanding our perspectives to include the multidimensional and complex network of interactions that underlie that behavior. The existence of and the complex interactions among adolescent's predisposition toward categories of High Action, Addiction, and Protection behaviors influenced the adolescent tendency toward engagement in each of these categories' behaviors. The existence of and the complex interactions among such predispositions also influenced the likelihood of adolescent youth assault-injury. The findings of the current study demonstrated that the complexity of the assault-injury expands beyond merely one line connecting one behavior to another.

Researchers can use the approach of this study for developing the examination of youth assault-injury and its determinants, and other youth problem behaviors. Public health practitioners can focus efforts and resources dedicated to reducing youth assault-injury prevalence in the United States on key areas (e.g., High Action behaviors). This focus may result not only in decreasing the adolescents' involvements in high risk behaviors, but in decreasing the incidence of assault-injury. Effective use of this study's finding by public health practitioners may contribute in saving the precious lives of American youths and reducing the economic and social burden of assault-injury. Taking into account the frequency of tragic events of weapon use on school properties in the United States and their adverse consequences on society and youth, my study may contribute to protecting the lives of youth in the United States. Positive social change could also result from directing youth energy toward success, by addressing the adolescents' High Action behaviors. Supporting adolescent safety allows their active contribution in developing their lives and surroundings.

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Appendix A: Tables

Table A1. The Study Variables Operationalizing Questions' Wording, Measures, Level of Measurement, and names from Wave II In-Home Questionnaires

Variable type	Variable name	Questions	Potential responses	Level of measurement	Variables names
Dependent	Assault-injury	During the past 12 months, how often did each of the following things happen?			
		3. Someone shot you.	0: never 1: once 2: more than once 6: refused 8: don't know	Ordinal	H2FV3
		4. Someone cut or stabbed you.	0: never 1: once 2: more than once 6: refused 8: don't know	Ordinal	H2FV4
		7. You shot or stabbed someone.	0: never 1: once 2: more than once 6: refused 8: don't know	Ordinal	H2FV7
		20. In the past 12 months, how many times were you in a physical fight in which you were injured and had to be treated by a doctor or nurse?	range 0 to 333 times 996: refused 997: legitimate skip 998: don't know	Interval	H2FV20
		22. In the past 12 months, how often did you hurt someone badly enough to need bandages or care from a doctor or nurse?	0: never 1: 1 or 2 times 2: 3 or 4 times 3: 5 or more times 6: refused 7: legitimate skip 8: don't know	Ordinal	H2FV22
Independent	Physical training	During the past week, how many times did			

		you... 5. play an active sport, such as baseball, softball, basketball, soccer, swimming, or football?	0: not at all 1: 1 or 2 times 2: 3 or 4 times 3: 5 or more times 8: don't know	Ordinal	H2DA5
Independ ent	Weapon carrying and use	During the past 12 months, how often did each of the following things happen?			
		6. You pulled a knife or gun on someone.	0: never 1: once 2: more than once 6: refused 8: don't know	Ordinal	H2FV6
		10. used a weapon in a fight?	0: no 1: yes 6: refused 8: don't know	Dichotomou s	H2FV10
		11. carried a weapon at school?	0: no 1: yes 6: refused 8: don't know	Dichotomou s	H2FV11
		In the past 12 months, how often did you... 9. use or threaten to use a weapon to get something from someone?	0: never 1: 1 or 2 times 2: 3 or 4 times 3: 5 or more times 6: refused 8: don't know	Ordinal	H2DS9
Independ ent	Risky sexual behavior	10. Thinking of all the times you have had sexual intercourse since {MOLI}, about what proportion of the time {HAVE YOU/HAS A PARTNER OF YOURS} used a condom?	1: none of the time 2: some of the time 3: half of the time 4: most of the time 5: all of the time 7: legitimate skip 8: don't know	Ordinal	H2CO10
		11. Thinking of all the times you have had	1: none of the time	Ordinal	H2CO11

		sexual intercourse during the past 12 months, about what proportion of the time have you or a partner of yours used birth control, that is, some form of pregnancy protection?	2: some of the time 3: half of the time 4: most of the time 5: all of the time 6: refused 7: legitimate skip 8: don't know		
		9. Since {MOLI}, with how many people, not including romantic relationship partners, have you had a sexual relationship?	range 1 to 444 people 996: refused 997: legitimate skip 998: don't know	Interval	H2NR9
Independent	Delinquency	Delinquency mean score variable generated from the following items:	Range	Interval-Scale from	delinquency from:
		1.paint graffiti or signs on someone else’s property or in a public place?		0: never 1: 1 or 2 times 2: 3 or 4 times 3: 5 or more times 6: refused 8: don’t know	H2DS1
		2.deliberately damage property that didn’t belong to you?			H2DS2
		3.lie to your parents or guardians about where you had been or whom you were with?			H2DS3
		4. take something from a store without paying for it?			H2DS4
		5. run away from home?			H2DS5
		6. drive a car without its owner’s permission?			H2DS6
		7. steal something worth more than $50?			H2DS7
		8. go into a house or building to steal something?			H2DS8
		10. sell marijuana or other drugs?			H2DS10
		11. steal something worth less than $50?			H2DS11

		12. act loud, rowdy, or unruly in a public place?			H2DS12
		14. Have you been initiated into a named gang?			H2DS14
Independent	Aggression	In the past 12 months, how often did you 13. take part in a fight where a group of your friends was against another group?	0: never 1: 1 or 2 times 2: 3 or 4 times 3: 5 or more times 6: refused 8: don't know	Ordinal	H2DS13
		16. In the past 12 months, how often did you get into a serious physical fight?	0: never 1: 1 or 2 times 2: 3 or 4 times 3: 5 or more times 6: refused 8: don't know	Ordinal	H2FV16
Independent	Cigarette smoking	3. Since {MOLI}, have you smoked cigarettes regularly, that is, at least one cigarette every day for 30 days?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomous	H2TO3
Independent	Drug use	45. Since {MOLI}, how many times have you used marijuana?	range 1 to 996 times 9996: refused 9997: legitimate skip 9998: don't know	Interval	H2TO45
		51. Since {MOLI}, how many times have you used cocaine?	range 1 to 900 times 996: refused 997: legitimate skip 998: don't know	Interval	H2TO51
		55. Since {MOLI}, how many times have you used inhalants?	range 1 to 360 times 996: refused 997: legitimate skip	Interval	H2TO55

			998: don't know		
		59. Since {MOLI}, how many times have you used any of these types of illegal drugs?	range 1 to 996 times 996: refused 997: legitimate skip 998: don't know	Interval	H2TO59
		64. During the past 30 days, how often did you take an illegal drug using a needle?	0: never 1: 1 or 2 times 2: 3 to 10 times 3: more than 10 times 7: legitimate skip	Ordinal	H2TO64
Independent	Problem drinking and Alcohol misuse	20. Think of all the times you have had a drink during the past 12 months. How many drinks did you usually have each time? A “drink” is a glass of wine, a can of beer, a wine cooler, a shot glass of liquor, or a mixed drink.	range 1 to 95 times 96: refused 97: legitimate skip 98: don't know	Interval	H2TO20
		21. Over the past 12 months, on how many days did you drink five or more drinks in a row?	1: every day or almost every day 2: 3 to 5 days a week 3: 1 or 2 days a week 4: 2 or 3 days a month 5: once a month or less (3-12 times in the past 12 months) 6: 1 or 2 days in the past 12 months 7: never 96: refused 97: legitimate skip 98: don’t	Ordinal	H2TO21

			know		
		22. Over the past 12 months, on how many days have you gotten drunk or "very, very high" on alcohol?	1: every day or almost every day 2: 3 to 5 days a week 3: 1 or 2 days a week 4: 2 or 3 days a month 5: once a month or less (3-12 times in the past 12 months) 6: 1 or 2 days in the past 12 months 7: never 96: refused 97: legitimate skip 98: don't know	Ordinal	H2TO22
Independent	Car driving while intoxicated	Since {MOLI}, have you... 36. driven while drunk?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomous	H2TO36
		Since {MOLI}, have you... 11. driven while high on drugs?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomous	H2JO11
Independent	Risk behavior while intoxicated	During the past 12 months, how often did each of the following things happen?			
		8. drunk alcohol while carrying a weapon, such as a gun, knife, or club?	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2FV8
		9. used drugs while carrying a weapon, such as a gun, knife, or club?	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2FV9
		33. did you get into a physical fight because you had been drinking?	0: never 1: once 2: twice 3: 3 to 4	Ordinal	H2TO33

			times 5: 5 or more times 6: refused 7: legitimate skip 8: don't know		
		34. The most recent time you got into a fight, had you been drinking?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomous	H2TO34
		35. Were you drunk?	0: no 1: yes 7: legitimate skip 8: don't know	Dichotomous	H2TO35
		4. Were you drunk when you had sexual intercourse most recently?	0: no 1: yes 7: legitimate skip	Dichotomous	H2JO4
		7. The most recent time you had sexual intercourse, had you been using drugs?	0: no 1: yes 2: You have had sexual intercourse only once. 6: refused 7: legitimate skip 8: don't know	Ordinal	H2JO7
		13. Since {MOLI}, have you... gotten into a fight when you had been using drugs?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomous	H2JO13
Independent	Proper diet	Now we're going to talk about things you ate yesterday. Yesterday, did you eat...	Rang 0 to 18	Interval-Scale From dichotomous variables	Healthy diet
		10. apples, applesauce, pears, or pineapple?			H2NU10
		11. bananas, plantains, grapes, berries, or cherries?			H2NU11
		12. cantaloupes, melons, mangoes, or papayas?	0: no 1: yes		H2NU12
		13. oranges,	8: don't know		H2NU13

		grapefruit, tangerines, or kiwis?			
		14. peaches, plums, nectarines, or apricots?			H2NU14
		15. raisins or dried fruit?			H2NU15
		16. mixed vegetables, or acorn, hubbard, or winter squash?			H2NU16
		17. avocadoes?			H2NU17
		18. string beans, green beans, peas, or snow peas?			H2NU18
		19. cabbage or bok choy?			H2NU19
		20.broccoly?			H2NU20
		21.carrots?			H2NU21
		22. dried beans, peas, lentils, black beans, or soybeans?			H2NU22
		23. field peas, chick peas, or lima beans?			H2NU23
		24. kale, beet greens, mustard greens, turnip greens, or collard greens?			H2NU24
		25. lettuce or tossed salad?			H2NU25
		26.spinach?			H2NU26
		27.tomato?			H2NU27
		28.tofu?			H2NU28
		29. yams or sweet potatoes?			H2NU29
		30. zucchini, summer squash, eggplants, bell peppers, or asparagus?			H2NU30
		65. peanut butter, peanuts, or other nuts? In the last seven days, on how many days did you eat...			H2NU65
Independent	Dental hygiene	3. In the past year, have you had a dental examination by a dentist or hygienist?	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2HS3
Independent	Using safety equipment	36. How often do you wear a helmet when you ride a bicycle?	0: never 1: rarely 2: sometimes 3: most of the time 4: always 5: never rides	Ordinal	H2GH36

			a bicycle 8: don't know		
Independent	Wearing a seatbelt	39. How often do you wear a seatbelt when you are riding in or driving a car?	0: never 1: rarely 2: sometimes 3: most of the time 4: always 8: don't know	Ordinal	H2GH39
Independent	Church attendance	3. In the past 12 months, how often did you attend religious services?	1: once a week or more 2: once a month or more, but less than once a week 3: less than once a month 4: never 6: refused 7: legitimate skip 8: don’t know	Ordinal	H2RE3
		4. How important is religion to you?	1: very important 2: fairly important 3: fairly unimportant 4: not important at all 6: refused 7: legitimate skip 8: don’t know	Likert-Scale	H2RE4
		6. How often do you pray?	1: at least once a day 2: at least once a week 3: at least once a month 4 less than once a month 5: never 6: refused 7: legitimate skip 8: don’t know	Ordinal	H2RE6
		7. Many churches, synagogues, and other places of worship have	1: once a week or more 2: once a	Ordinal	H2RE7

		special activities for teenagers—such as youth groups, Bible classes, or choir. In the past 12 months ,how often did you attend such youth activities?	month or more, but less than once a week 3: less than once a month 4: never 6: refused 7: legitimate skip 8: don't know		
Independent	School performance	At the {MOST RECENT GRADING PERIOD/LAST GRADING PERIOD IN THE SPRING}...			
		7. what was your grade in English or language arts?	1: A 2: B 3: C 4: D or lower 5: didn't take this subject 6: took the subject, but it wasn't graded this way 96: refused 97: legitimate skip 98: don't know	Ordinal	H2ED7
		8. what was your grade in mathematics?	1: A 2: B 3: C 4: D or lower 5: didn't take this subject 6: took the subject, but it wasn't graded this way 96: refused 97: legitimate skip 98: don't know	Ordinal	H2ED8
		9. what was your grade in history or social studies?	1: A 2: B 3: C 4: D or lower 5: didn't take	Ordinal	H2ED9

			this subject 6: took the subject, but it wasn't graded this way 96: refused 97: legitimate skip 98: don't know		
		10. what was your grade in science?	1: A 2: B 3: C 4: D or lower 5: didn't take this subject 6: took the subject, but it wasn't graded this way 96: refused 97: legitimate skip 98: don't know	Ordinal	H2ED10
Independent	School connectedness	[Hand R show card 6.] How much do you agree or disagree with the following statements?			
		15. [If SCHOOL YEAR:] You feel close to people at your school. [If SUMMER:] Last year, you felt close to people at your school.	1: strongly agree 2: agree 3: neither agree nor disagree 4 disagree 5: strongly disagree 6: refused 7: legitimate skip 8: don't know	Likert-scale	H2ED15
		16. [If SCHOOL YEAR:] You feel like you are part of your school. [If SUMMER:] Last year, you felt like you were part of your school.	1: strongly agree 2: agree 3: neither agree nor disagree 4 disagree 5: strongly disagree	Likert-scale	H2ED16

			6: refused 7: legitimate skip 8: don't know		
		18. [If SCHOOL YEAR:] You are happy to be at your school. [If SUMMER:] Last year, you were happy to be at your school.	1: strongly agree 2: agree 3: neither agree nor disagree 4 disagree 5: strongly disagree 6: refused 7: legitimate skip 8: don't know	Likert-scale	H2ED18
		19. [If SCHOOL YEAR:] The teachers at your school treat students fairly. [If SUMMER:] Last year, the teachers at your school treated students fairly.	1: strongly agree 2: agree 3: neither agree nor disagree 4 disagree 5: strongly disagree 6: refused 7: legitimate skip 8: don't know	Likert-scale	H2ED19
		20. [If SCHOOL YEAR:] You feel safe in your school. [If SUMMER:] Last year, you felt safe in your school.	1: strongly agree 2: agree 3: neither agree nor disagree 4 disagree 5: strongly disagree 6: refused 7: legitimate skip 8: don't know	Likert-scale	H2ED20
Covariate	Age	CALCULATED AGE-W2	11: 11 years old 12: 12 years old 13: 13 years old 14:14 years old 15: 15 years	Interval	CALCAGE2

			old 16: 16 years old 17: 17 years old 18: 18 years old 19: 19 years old 20: 20 years old 21: 21 years old		
Covariate	Sex	BIOLOGICAL SEX-W2	1: male 2: female 6: refused	Dichotomous	BIO_SEX2
Covariate	Race	Are you of Hispanic or Latino origin? What is your race? White Black or African American American Indian or Native American? Asian or Pacific Islander? Other		Dichotomous	H1G14 H1GI6A H1GI6B H1GI6C H1GI6D H1GI6E
Covariate	Socioeconomic status	1. How far in school did he go?	1: eighth grade or less H2RF1 2 more than eighth grade, but did not graduate from high school 3: went to a business, trade, or vocational school instead of high school 4: high school graduate 5: completed a GED 6: went to a business, trade, or vocational school after high school	Categorical	H2RF1

		7: went to college but did not graduate 8: graduated from a college or university 9: professional training beyond a four-year college or university 10: He never went to school. 11: He went to school, but R doesn't know what level. 12: R doesn't know if he went to school. 96: refused 97: legitimate skip		
	4. [Hand show card 17.] What kind of work does he do? If he does more than one kind of work, tell me the one for which he is paid the most or at which he spends the most time.	1: professional 1, such as doctor, lawyer, scientist 2: professional 2, such as teacher, librarian, nurse 3: manager, such as executive, director 4: technical, such as computer specialist, radiologist	Categorical	H2RF4

5: office worker, such as bookkeeper, office clerk, secretary 6: sales worker, such as insurance agent, store clerk 7: restaurant worker or personal service, such as waitress, housekeeper 8: craftsperson, such as toolmaker, woodworker 9: construction worker, such as carpenter, crane operator 10: mechanic, such as electrician, plumber, machinist 11: factory worker or laborer, such as assembler, janitor 12: transportation, such as bus driver, taxi driver 13: military or security, such as police officer, soldier, fire fighter 14: farm or fishery worker 15

		other 16: none [skip to Q.6] 96: refused 97: legitimate skip 98: don't know		
	9. Does he receive public assistance, such as welfare?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomou s	H2RF9
	1. How far in school did she go?	1: eighth grade or less H2RF1 2 more than eighth grade, but did not graduate from high school 3: went to a business, trade, or vocational school instead of high school 4: high school graduate 5: completed a GED 6: went to a business, trade, or vocational school after high school 7: went to college but did not graduate 8: graduated from a college or university 9: professional training beyond a four-year	Categorical	H2RM1

		college or university 10: He never went to school. 11: He went to school, but R doesn't know what level. 12: R doesn't know if he went to school. 96: refused 97: legitimate skip		
	4. [Hand showcard 17.] What kind of work does she do? If he does more than one kind of work, tell me the one for which he is paid the most or at which he spends the most time.	1: professional 1, such as doctor, lawyer, scientist 2: professional 2, such as teacher, librarian, nurse 3: manager, such as executive, director 4: technical, such as computer specialist, radiologist 5: office worker, such as bookkeeper, office clerk, secretary 6: sales worker, such as insurance agent, store clerk 7: restaurant worker or personal	Categorical	H2RM4

		service, such as waitress, housekeeper 8: craftsperson, such as toolmaker, woodworker 9: construction worker, such as carpenter, crane operator 10: mechanic, such as electrician, plumber, machinist 11: factory worker or laborer, such as assembler, janitor 12: transportation, such as bus driver, taxi driver 13: military or security, such as police officer, soldier, fire fighter 14: farm or fishery worker 15 other 16: none [skip to Q.6] 96: refused 97: legitimate skip 98: don't know		
	9. Does she receive public assistance, such as welfare?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomous	H2RM9

Table A2. The Adjusted Measures

Variable type	Variable name	Questions	Potential responses	Level of measurement	Variables names
Independent	Risky sexual behavior	9. Since {MOLI}, {HAVE YOU/HAS A PARTNER OF YOURS} ever used a condom during sexual intercourse?	0: no 1: yes 6: refused 7: Legitimate skip 8: don't know	Dichotomous	H2CO9
		8. Since {MOLI}, with how many people, in total, including romantic relationship partners, have you ever had a sexual relationship? If you don't remember exactly, please estimate the number of these people.	range 1 to 987 people 996: refused 997: Legitimate skip 998: don't know	Interval	H2NR8
Independent	Drug use	44. Since {MOLI}, have you tried or used marijuana?	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2TO44
		50. Since {MOLI}, have you tried or used any kind of cocaine—including powder, freebase, or crack cocaine	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2TO50
		54. Since {MOLI}, have you tried or used inhalants, such as glue or solvents?	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2TO54
		58. Since {MOLI}, have you tried or used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, or pills, without a doctor's prescription?	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2TO58
		61. Since {MOLI}, have you injected, shot up with a needle, any illegal drug, such as heroin or cocaine?	0: no 1: yes 6: refused 8: don't know	Dichotomous	H2TO61
Independent		Car driving while drunk Since {MOLI}, have you.. 36. driven while drunk?	0: no 1: yes 6: refused 7: legitimate	Dichotomous	H2TO36

		skip 8: don't know		
Independent	Car driving while high on drugs Since {MOLI}, have you.. 11. driven while high on drugs?	0: no 1: yes 6: refused 7: legitimate skip 8: don't know	Dichotomous	H2JO11

Appendix B: Figures

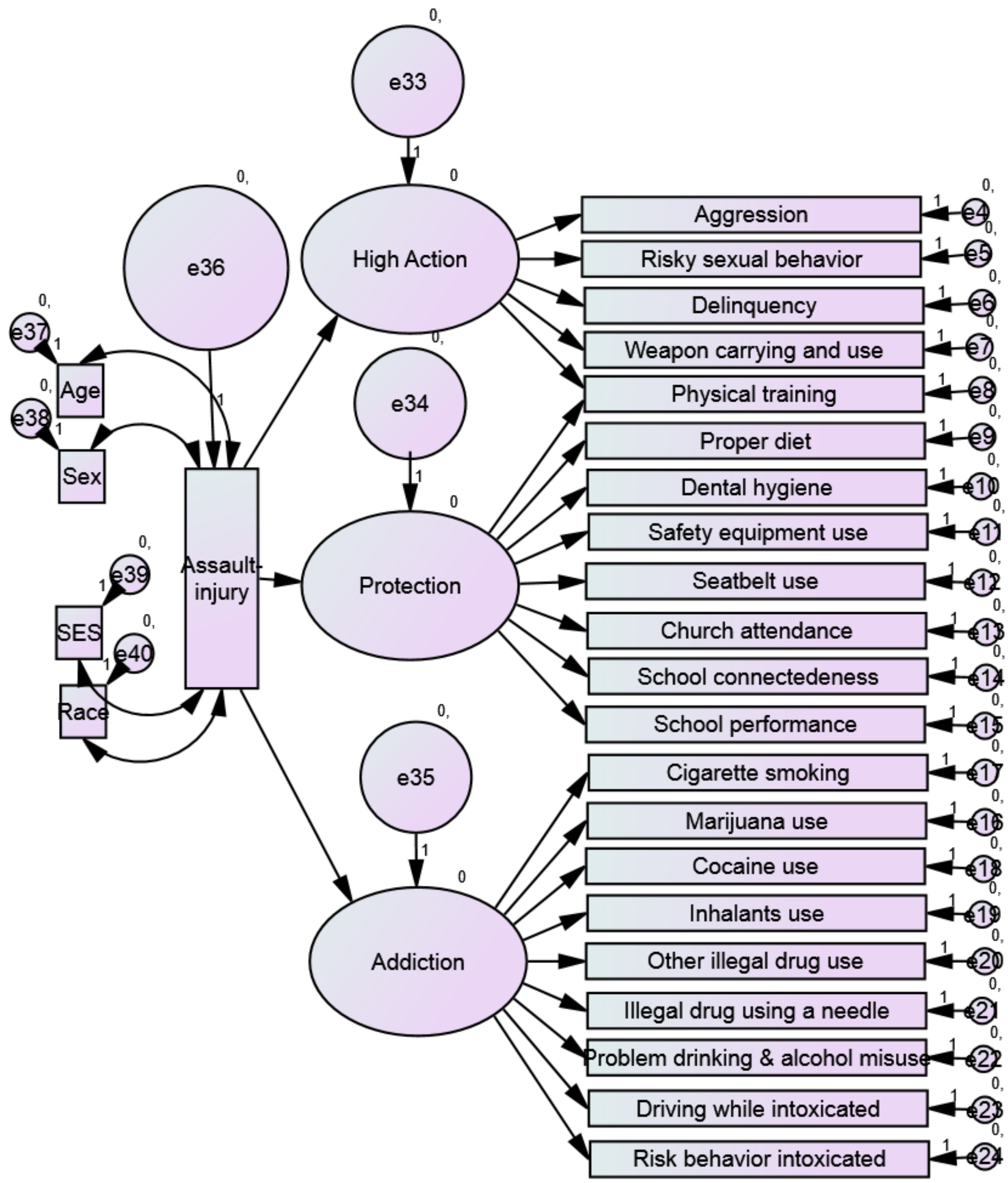

Figure B1. The hypothetical model.

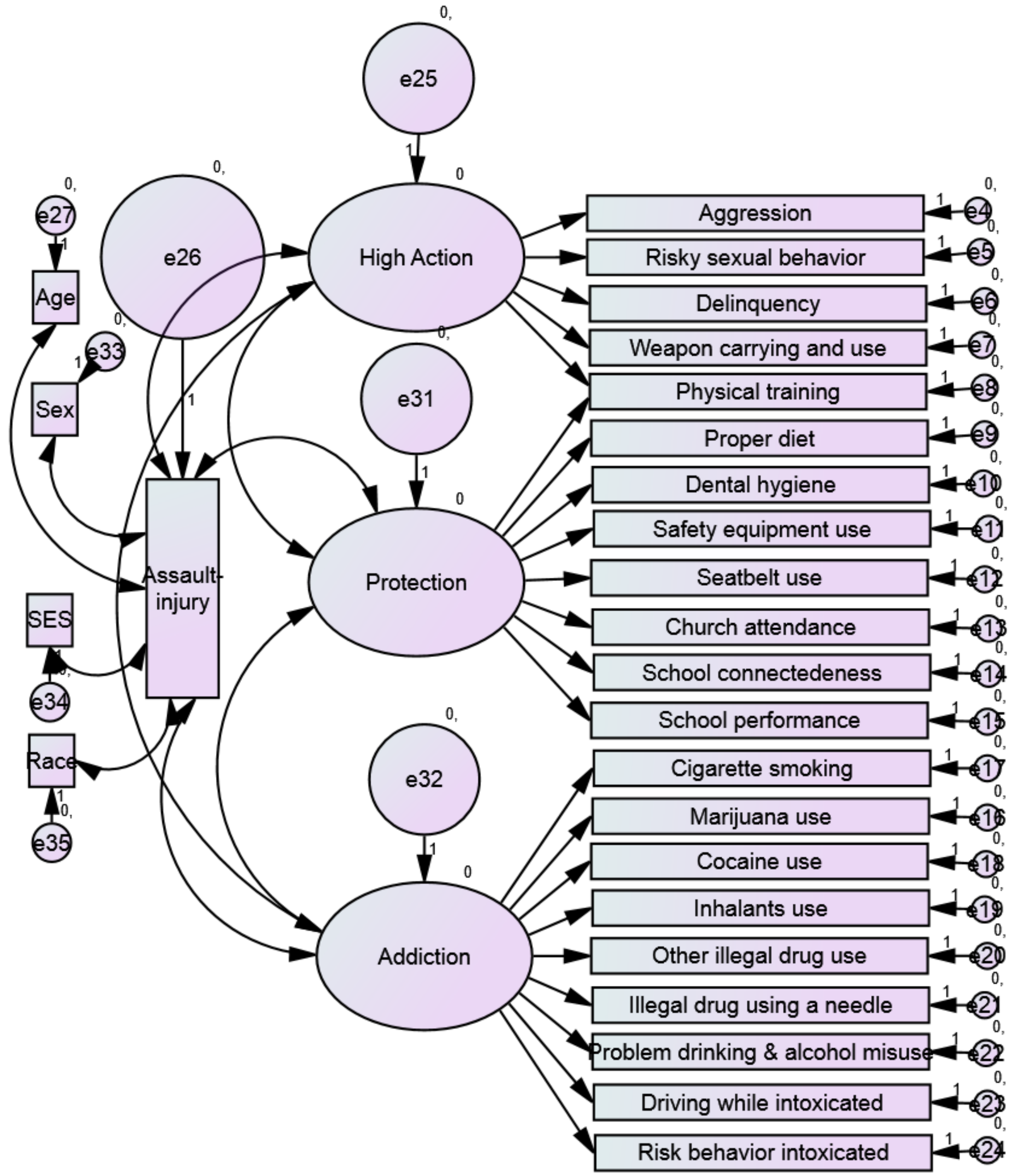

Figure B2. The hypothetical interactions in the model.

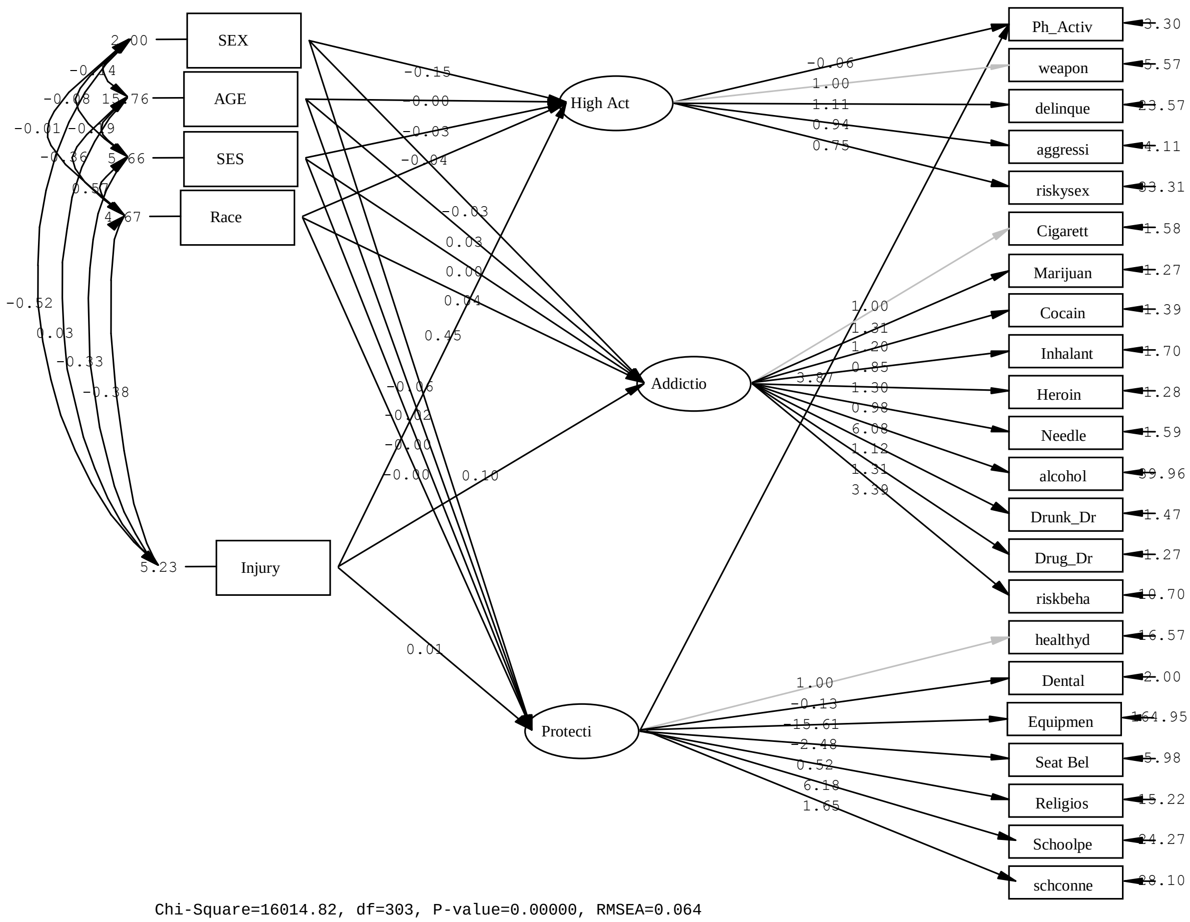

Figure B3. The hypothetical model (estimates).

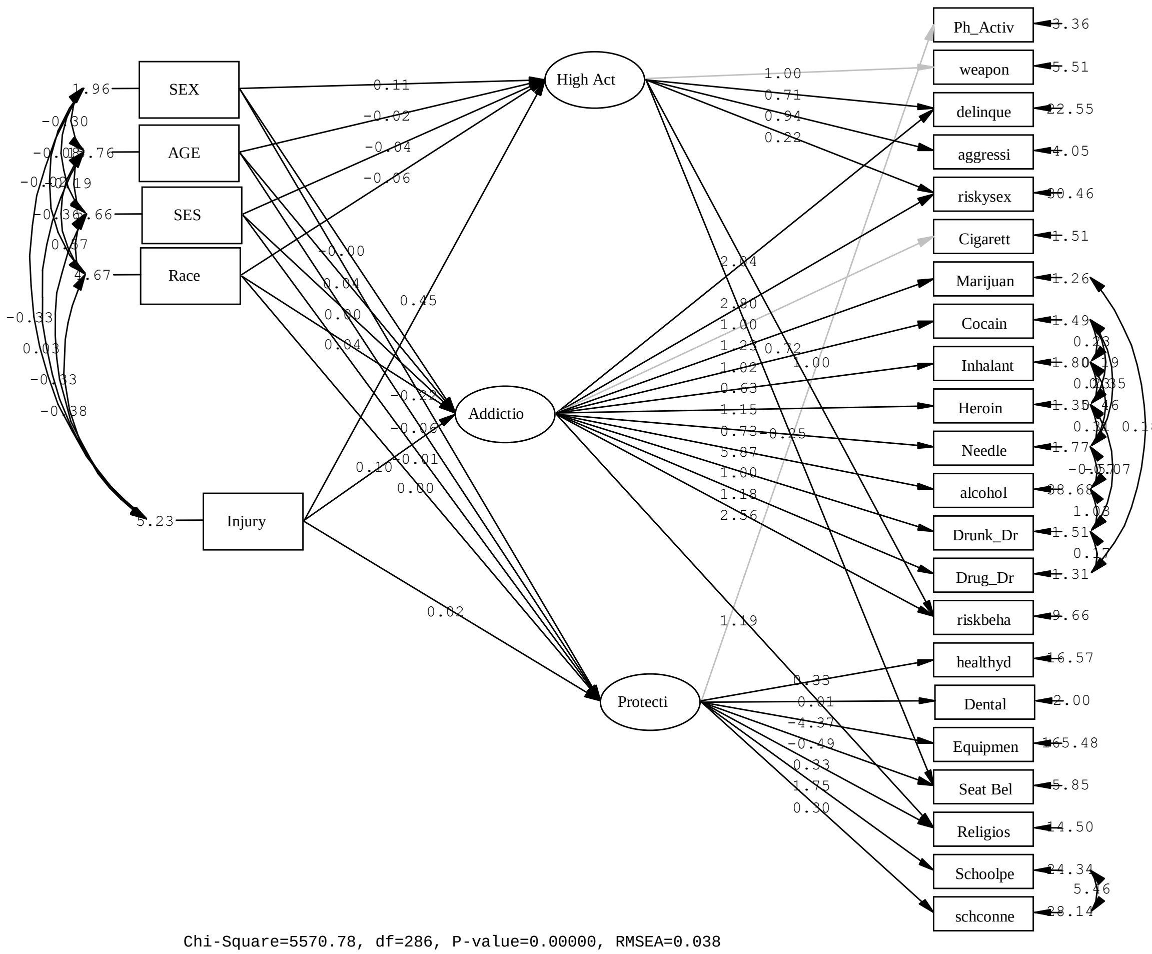

Figure B4. The modified hypothetical model (estimates).

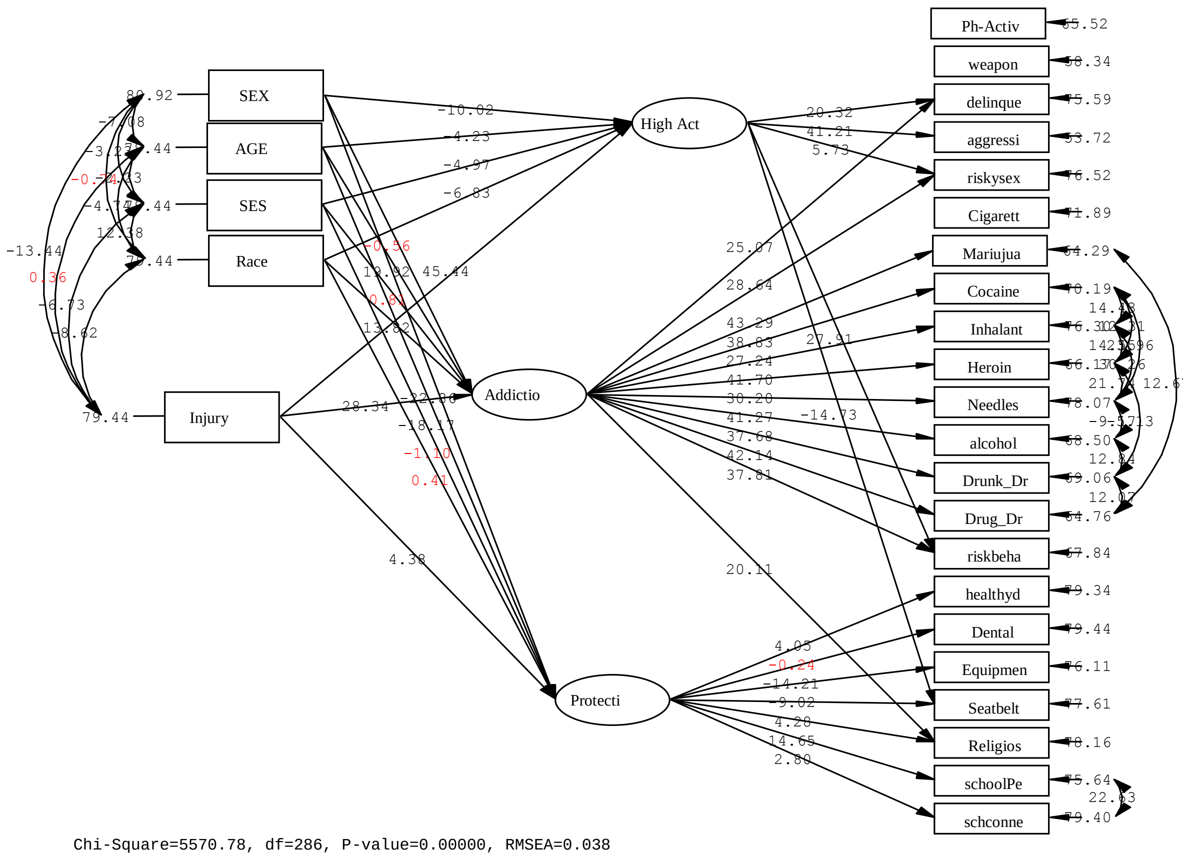

Figure B5. The modified hypothetical model (*t*-values).

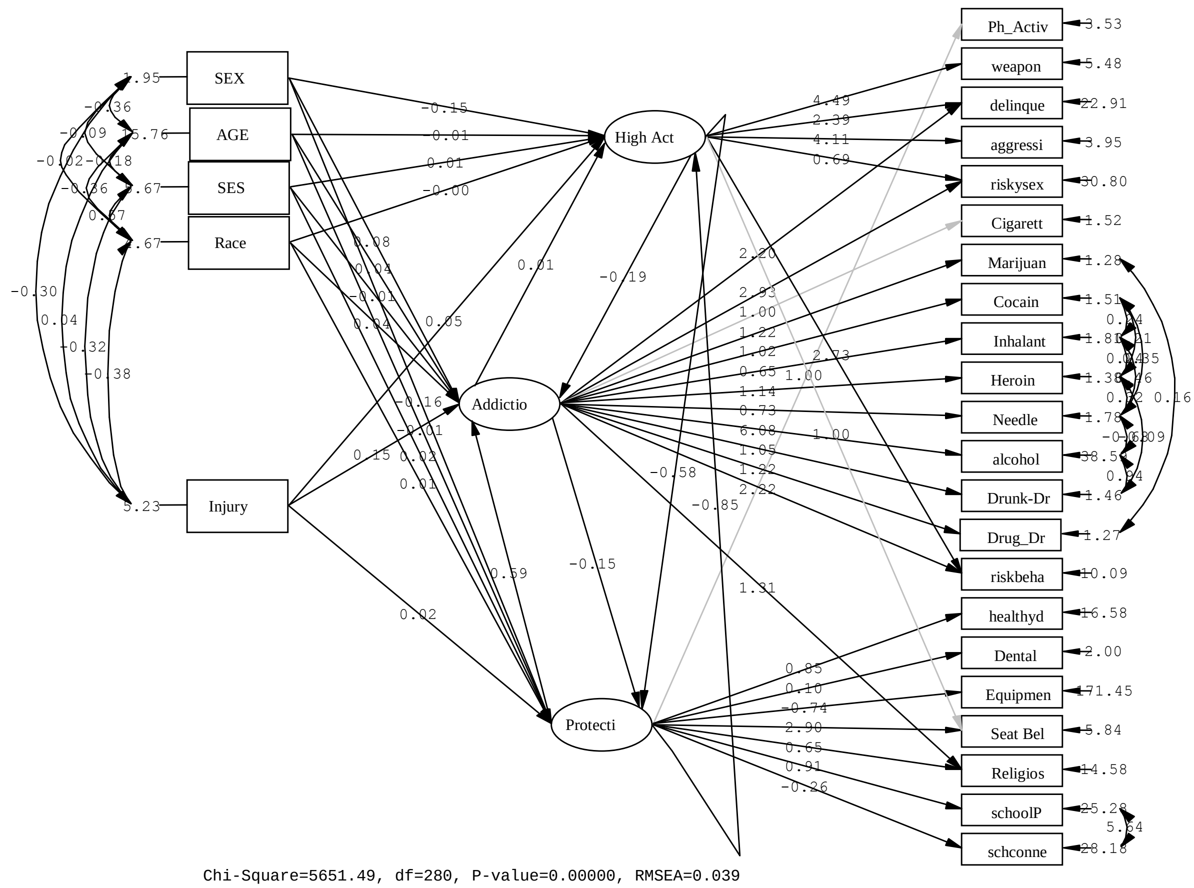

Figure B6. The nonrecursive model (estimates).

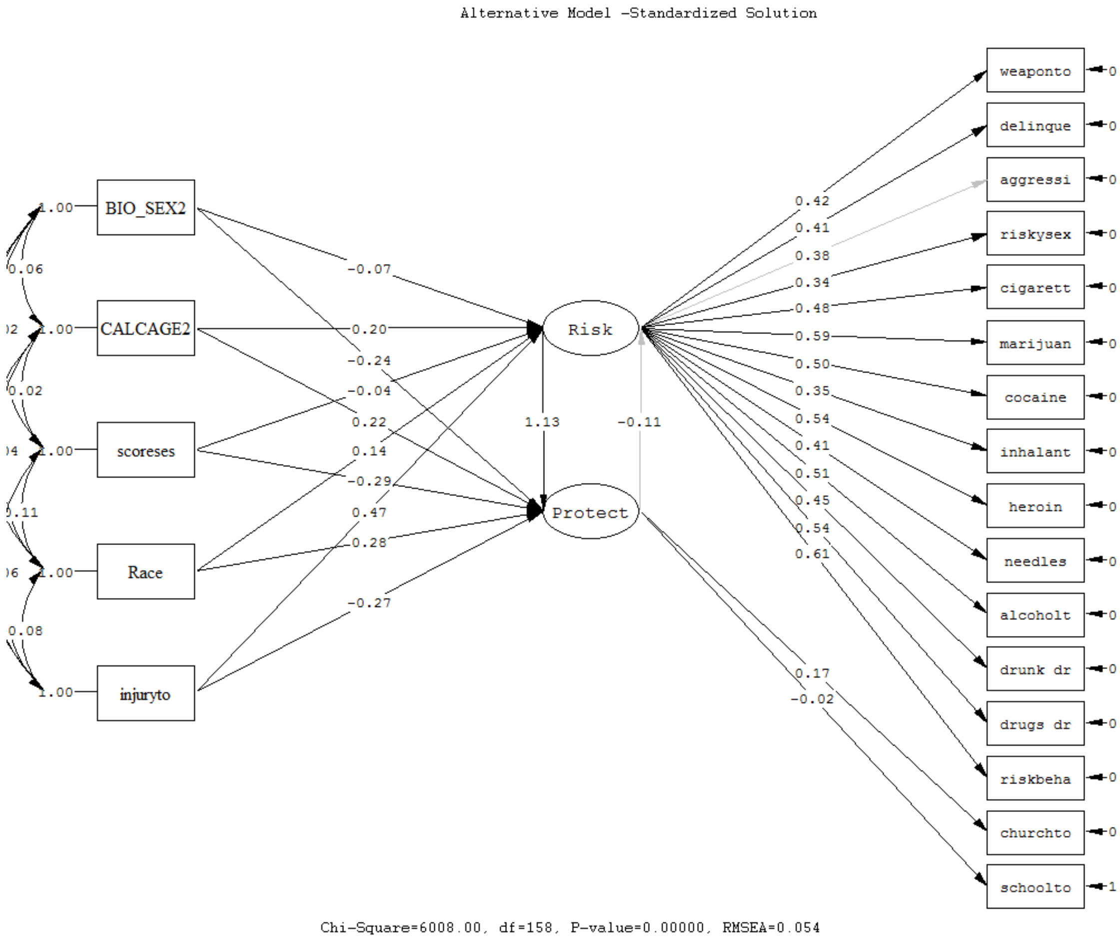

Figure B7. The alternative model (estimates).

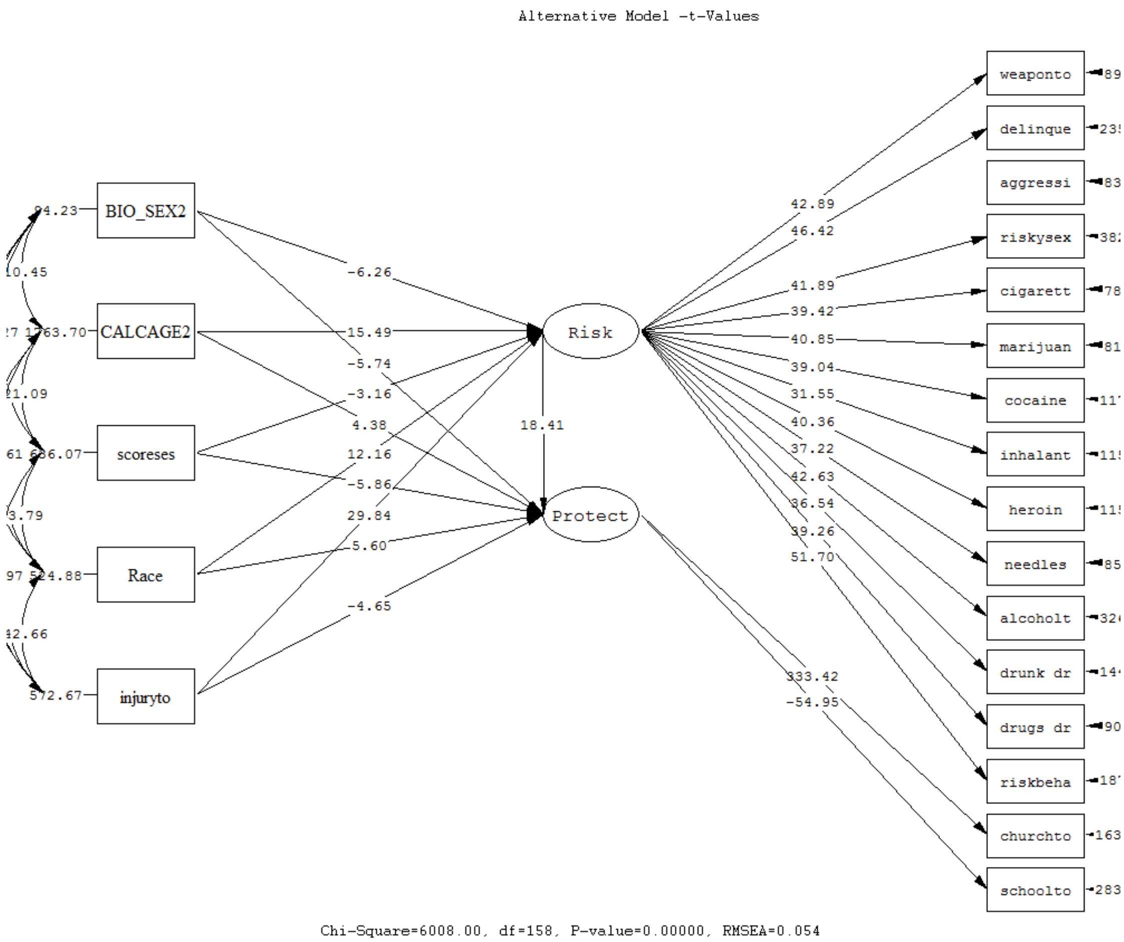

Figure B8. The alternative model (*t*-Values)

Appendix C: Restricted Use Data Contract

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Investigator Information

DATE	6/2/2015
NAME OF INVESTIGATOR	Peter B. Anderson
INVESTIGATOR'S DEGREE	Ph.D.
INVESTIGATOR'S POSITION	Professor, Core Faculty
INVESTIGATOR'S INSTITUTION	Walden University
DEPARTMENT	College of Health Sciences
STREET ADDRESS	**Note:** *Because data CDs will be shipped by 2nd-day traceable delivery, we cannot accept P.O. BOXES.*
CITY/STATE/ZIP CODE	
TELEPHONE	
FAX	
EMAIL	
TITLE OF RESEARCH PROJECT	Youth Assault-Injury Variation Patterns and Their Underlying Structure

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Agreement for the Use of Restricted-Use Data

I. Definitions

A. "The National Longitudinal Study of Adolescent Health" (hereinafter referred to as "Add Health") is the program project undertaken by the Carolina Population Center of The University of North Carolina at Chapel Hill (hereafter referred to as UNC-Chapel Hill) under Grant No. P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

B. "Investigator" is the person primarily responsible for supervision of the research project, security of the data, and use of sensitive data obtained through this Agreement.

C. "Research Staff" are all persons, excluding Investigator, who will have access to sensitive data obtained through this Agreement.

D. "Institution" is the university or research institution that employs Investigator and that is the signatory to this Agreement on behalf of Investigator.

E. "Representative of Institution" is a person authorized to enter into contractual agreements on behalf of Institution.

F. "Sensitive Data" includes any data from Add Health that might compromise the anonymity or privacy of respondents to that study. Because of the school-based study design, Add Health respondents (adolescents, parents, and schools) are at higher risk of deductive disclosure than randomly sampled individuals. Therefore, all data collected from Add Health are considered to be sensitive.

G. "Data File" includes any form of data, whether on paper or electronic media.

H. "Funding Agency" is a federal office or institute that provided funding for Add Health. Funding agencies are only the offices or institutes providing the funding; other divisions or institutes within the larger organization are not considered funding agencies.

I. "Contract Period" is the three (3)-year period that begins and ends on the dates specified on page 11 .

J. "Processing Fee" is a nonrefundable payment of $850 that covers the expenses of producing and shipping Data Files and codebooks, of consulting, and of administering this Agreement.

II. Requirements of Investigators

Investigators must meet the following criteria:

A. Have a PhD or other terminal degree; and

B. Hold a faculty appointment or research position at Institution

Agreement for the Use of Restricted-Use Data
(continued)

III. Requirements of Institution

Institution must meet the following criteria:

A. Be an institution of higher education, a research organization, or a government agency

B. Have a demonstrated record of using sensitive data according to commonly accepted standards of research ethics

IV. Obligations of Add Health

In consideration of the promises made in Section V of this Agreement and of receipt of the monies noted in Section V. I., Add Health agrees to the following, once a copy of the completed contract has been received and Attachment A has been approved:

A. To submit for review by the appropriate officials of UNC-Chapel Hill the original of this Agreement.

B. To return one fully signed original to Investigator by first-class mail.

C. To assign the effective dates of the three (3)-year Contract Period on the Institutional Signatures page. The initiation date will be within 15 working days of receipt of the signed originals from appropriate UNC-Chapel Hill officials.

D. To provide the Data Files requested by Investigator in the Data File Order within a reasonable time frame following execution of this Agreement by appropriate officials of UNC-Chapel Hill and to send the requested Data Files to Investigator on a CD-ROM by second-day trackable delivery. All Data Files will be compressed and encrypted.

E. To provide codebooks which contain the origins, form, and general content of the Data Files sent to Investigator within the same time frame and manner as specified in paragraph D regarding the Data Files.

F. To provide one (1) hour of consultation to Investigator and/or Research Staff regarding the origins, form, and general content of the Data Files, and regarding required and preferred techniques for data management of those Data Files. Further consultation is available for an additional fee.

V. Obligations of the Investigator, Research Staff, and Institution

Data provided under this Agreement shall be held by the Investigator, Research Staff, and Institution in strictest confidence and can be disclosed only in compliance with the terms of this Agreement.

In consideration of the promises contained in Section IV of this agreement, and for use of Data Files from Add Health, the Investigator, Research Staff, and Institution agree:

A. That the Data Files will be used solely for statistical analyses: that no attempt will be made to identify specific individuals, families, households, schools, institutions, or geographic locations not provided by Add Health; and that no list of Sensitive Data at the individual or family level will be published or otherwise distributed.

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Agreement for the Use of Restricted-Use Data
(continued)

B. That if the identity of any person, family, household, school, institution or geographic location should be discovered inadvertently, then:

1. No use will be made of this knowledge;

2. Add Health will be advised of the incident within one (1) business day of Investigator's, Research Staff's, or Institution's discovery of the incident;

3. The information that would identify the person, family, household, school, or institution will be safeguarded or destroyed as requested by Add Health and a written certification of destruction provided to Add Health; and

4. No one else will be informed of the discovered identity.

C. To avoid inadvertent disclosure of persons, families, or households by using the following guidelines in the release of statistics derived from the Data Files.

1. In no table should all cases in any row or column be found in a single cell.

2. In no case should the total for a row or column of a cross-tabulation be fewer than three (3).

3. In no case should a cell frequency of a cross-tabulation be fewer than three (3) cases.

4. In no case should a quantity figure be based on fewer than three (3) cases.

5. Data released should never permit disclosure when used in combination with other known data.

D. That no persons other than those identified in this Agreement, or in amendments subsequent to this agreement, as Investigator or Research Staff, be permitted access to the contents of Data Files or any files derived from sensitive Data Files.

1. That within one (1) business day of becoming aware of any unauthorized access, use, or disclosure of Sensitive Data, the unauthorized access, use, or disclosure of Sensitive Data will be reported in writing to Add Health.

E. To comply fully with the Sensitive Data Security Plan, which is included as Attachment A to this Agreement. The Sensitive Data Security Plan expires at the end of the Contract Period.

F. To respond fully and in writing within ten (10) working days after receipt of any inquiry from Add Health regarding compliance with this Agreement or the expected date of completion of work with the Sensitive Data and any data derived therefrom.

G. To make available for inspection by Add Health, during business hours, the physical housing and handling of all Data Files and any other information, written or electronic, relating to this Agreement.

Agreement for the Use of Restricted-Use Data
(continued)

H. To supply Add Health with a copy of each of the following:

1. Investigator Information form
2. Agreement for the Use of Sensitive Data, each with original Institutional Signatures page
3. Sensitive Data Security Plan (Attachment A)
4. Data File Order with specific files requested, and explanatory statements for constructed datasets (if requested) (Attachment B)
5. Supplemental Agreement with Research Staff for the Use of Sensitive Data signed by each Research Staff person (Attachment C)
6. Security Pledges for the Investigator and each Research Staff person (Attachment D)
7. List of Funding Agencies (Attachment E)
8. Description of Deductive Disclosure Risk (Attachment F)
9. A copy of the document, originated by the Investigator and signed by Institution's Institutional Review Board (IRB), approving the research project AND the secure use, storage, and handling of the Add Health Data Files outlined in the Sensitive Data Security Plan.

I. To provide to UNC-Chapel Hill a nonrefundable processing fee in the amount of $850. Payment may be made by check, payable to "The University of North Carolina at Chapel Hill." The nonrefundable processing fee will be used to cover the expenses of producing and shipping Data Files and codebooks, of consulting, and of administering this Agreement.

An exemption to the nonrefundable processing fee may be made if the request for Data Files is from an Investigator at one of the Add Health funding agencies or institutes. To request a waiver of the nonrefundable processing fee, please include a letter from the head of the funding agency requesting that the fee be waived.

J. To include in each written report or other publication based on analysis of Sensitive Data from Add Health, the following statement:

This research uses data from Add Health, a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris, and funded by a grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 17 other agencies. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Persons interested in obtaining Data Files from Add Health should contact Add Health, The University of North Carolina at Chapel Hill, Carolina Population Center, 206 W. Franklin Street, Chapel Hill, NC 27516-2524 (addhealth_contracts@unc.edu). No direct support was received from grant P01-HD31921 for this analysis.

The University of North Carolina at Chapel Hill, Carolina Population Center
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Agreement for the Use of Restricted-Use Data (continued)

K. That all journal articles based on analysis of Confidential Data from Add Health receive a PubMed Central reference number (PMCID). Journal articles must be submitted to PubMed Central to receive a PMCID. The method of PubMed Central submission and Investigator responsibility for submission depend on the journal and journal publisher.

1. Some journals automatically submit published articles to PubMed Central. For a list of journals that submit articles to PubMed Central please visit the NIH website: http://publicaccess.nih.gov/submit_process_journals.htm

2. Some journal publishers may submit the articles to PubMed Central automatically or upon request by the author. For a list of journal publishers that submit articles to PubMed Central please visit the NIH website: http://publicaccess.nih.gov/select_deposit_publishers.htm#b

3. If neither the journal nor the journal publisher will submit the article to PubMed Central, the Investigator will be responsible to submit the final peer-reviewed manuscript to PubMed Central via the NIH Manuscript Submission System (NIHMS). For detailed instructions on the process of submitting a journal article to PubMed Central, please see the NIH website: http://publicaccess.nih.gov/submit_process.htm

4. If you have any problems with this process, please contact the NIHMS or PubMed help desk.

L. To complete the following protocol upon separation from Institution or the expiration of Investigator's contract:

1. Destroy all Data Files at the originally approved site

2. Submit a letter stating that all Add Health Data Files have been securely erased with the secure erasure program listed in the security plan for the originally approved site.

3. Return all CDs containing Data Files, within thirty (30) days of the expiration of the Contract Period, as specified on the Institutional Signatures page, or to submit a renewal application.

Add Health shall be able to visit within a year of contract termination, to confirm the data have been destroyed. This obligation of destruction shall not apply to Investigator's scholarly work produced during the Contract Period that is based upon or that incorporates the Restricted-Use Data.

M. To notify Add Health in the event Investigator plans to separate from Institution during the Contract Period. Such notification must be in writing and must be received by Add Health at least six (6) weeks prior to Investigator's last day of employment with Institution. Investigator's separation from Institution will terminate this Agreement. Investigator may, however, reapply to receive Data Files from Add Health in Investigator's capacity as an employee of his or her new institution. No fee will be charged for the administration of this process.

Concurrent with Investigator's notice to Add Health regarding a pending separation from Institution, Investigator must:

1. Return the Data File CDs to Add Health at the following address:

Agreement for the Use of Restricted-Use Data
(continued)

Add Health
Carolina Population Center
206 W. Franklin St.
Chapel Hill, NC 27516-2524

2. Destroy all electronic and paper files at the originally approved site prior to the date of relocation and submit a letter stating that all Add Health files have been securely erased with the secure erasure program listed in the security plan for the originally approved site. This obligation of destruction shall not apply to Investigator's scholarly work produced during the Contract Period that is based upon or that incorporates the Sensitive Data.

N. To obtain approval from Add Health prior to transferring this Agreement to another Investigator at the same Institution. No fee will be charged for the administration of this process. In order to obtain such approval, Investigator must:

1. Inform Add Health in writing six (6) weeks prior to the proposed date of transfer.
2. Submit a complete copy of this Agreement in the name of the new Investigator signed by an official representative of Investigator's new institution.
3. Maintain responsibility for the security of all Data File CDs until the transfer contract has been approved.

O. To submit annual reports to Add Health on or before each anniversary of the initial date of the Contract Period. Such reports must include:

1. A copy of the annual IRB approval for the research project
2. A list of public presentations at professional meetings using results based on the Data Files
3. A list of papers accepted for publication using these Data Files, with complete citations
4. A list of grants that have been have awarded for use of the Add Health Data Files
5. A list of graduate students using the Add Health Data Files for dissertations or theses, the titles of these papers, and the dates of completion
6. A current data user roster including the names of all research staff member(s) who have access to Data Files and their relationship(s) to the project

Such reports shall be signed by Investigator. Add Health reserves the right to terminate this Agreement in the event that the reports are not timely submitted.

Agreement for the Use of Restricted-Use Data
(continued)

P. That Investigator and Institution hereby acknowledge that any breach of the confidentiality provisions herein will result in irreparable harm to The University of North Carolina at Chapel Hill that are not adequately compensable by money damages. Investigator, Research Staff, and Institution hereby agree to the imposition of injunctive relief in the event of breach, in addition to money damages. Should Investigator, Research Staff, or Institution commit a material breach of this agreement that is not cured within thirty (30) days after Investigator or Institution receives notice of such breach from Add Health, Add Health reserves the right to terminate the Agreement, in which case all electronic and paper files will be securely erased; a letter will be submitted by the Investigator, stating that all Add Health files have been securely erased with the secure erasure program listed in the security plan; and CDs containing Data Files are to be returned. Investigator, Research Staff, and Institution understand and agree that a violation of any of the terms and conditions of this Agreement may constitute a violation of state and federal statutes and may subject Investigator, Research Staff, and/or Institution to the criminal, civil, and administrative penalties associated with violations of those statutes, in addition to constituting a material breach of this Agreement with attendant legal liabilities.

Q. That Investigator and Institution agree to indemnify, defend, and hold harmless The University of North Carolina at Chapel Hill, Add Health, and the sources of Sensitive Data from any or all claims and losses accruing to any person, organization, or other legal entity as a result of Investigator's, Research Staff's and/or Institution's acts, omissions, or breaches of this Agreement.

R. That Institution shall ensure that Research Staff comply with the provisions of this Agreement.

VI. Certificate of Confidentiality

Research subjects who participated in Add Health are protected by a certificate of confidentiality issued by the Department of Health and Human Services in accordance with the provisions of section 301(d) of the Public Health Service Act (42 U.S.C. § 241(d)). Institution is considered to be a contractor or cooperating agency of UNC-Chapel Hill under the terms of the Confidentiality Certificate; as such, Institution, Investigator, and Research Staff are authorized to protect the privacy of the individuals who are the subjects of Add Health by withholding their identifying characteristics from all persons not connected with the conduct of the study. Identifying characteristics are all Add Health Data Files which are defined as sensitive under the terms of this contract.

VII. Incorporation by Reference

The parties agree that the following documents are incorporated into this Agreement by reference:

A. A copy of the IRB approval of the research project, taking into special consideration deductive disclosure risks.

B. The Sensitive Data Security Plan proposed by Investigator and approved by Add Health.

C. The Department of Health and Human Services Confidentiality Certificate, a copy of which will be sent with the signed contract.

VIII. Attachments

A. Sensitive Data Security Plan for the Use of Restricted-Use Data from the National Longitudinal Study of Adolescent Health

Agreement for the Use of Restricted-Use Data
(continued)

B. Data File Order for the Use of Sensitive Data from the National Longitudinal Study of Adolescent Health

C. Supplemental Agreement with Research Staff for the Use of Sensitive Data from the National Longitudinal Study of Adolescent Health

D. Security Pledge for the Use of Sensitive Data from the National Longitudinal Study of Adolescent Health

E. List of Funding Agencies for the National Longitudinal Study of Adolescent Health

F. Description of Deductive Disclosure Risk from the National Longitudinal Study of Adolescent Health

IX. Miscellaneous

A. The laws of North Carolina shall govern the validity and interpretation of the provisions, terms and conditions of the Agreement. In the event the parties are unable to resolve any dispute relating to this agreement, all suits, actions, claims, and causes of action relating to this Agreement shall be brought in the courts of the State of North Carolina.

B. All notices, contractual correspondence, and return of data under this Agreement on behalf of the Investigator shall be made in writing and delivered to the address below:

Add Health
The University of North Carolina at Chapel Hill
Carolina Population Center
206 W. Franklin St.
Chapel Hill, NC 27516-2524

C. Provisions of Data Files, all notices, and contractual correspondence under this Agreement on behalf of Add Health shall be made in writing and delivered to Investigator at the address listed on the Institutional Signatures page.

D. This Agreement shall be effective for the dates indicated on the Institutional Signatures page.

E. The respective rights and obligations of Add Health and Investigator, Research Staff, and Institution pursuant to this Agreement shall survive termination of this agreement.

F. In the event of a material breach of this Agreement by the Investigator, Research Staff, or Institution, Add Health may terminate this Agreement by providing written notice to Investigator and Institution. In this event, Add Health will not be required to refund of any portion of the nonrefundable $850 processing fee.

G. This Agreement may be amended or modified only by the mutual written consent of the authorized representatives of Add Health and Investigator and Institution. Both parties agree to amend this Agreement to the extent amendment is necessary to comply with the requirements of any applicable regulatory authority.

H. This Agreement contains all of the terms and conditions agreed upon by the parties regarding the subject matter of this Agreement and supersedes any prior agreements, oral or written, and all other communications between the parties relating to such subject matters.

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Agreement for the Use of Restricted-Use Data
(continued)

I. The persons signing this Agreement have the right and authority to execute this Agreement, and no further approvals are necessary to create a binding agreement.

J. The obligations of Investigator, Research Staff, and Institution set forth within this Agreement may not be assigned or otherwise transferred without the express written consent of Add Health.

K. Add Health's existing ownership rights in its intellectual property, including its Sensitive Data and the Data Files, are not affected by this Agreement. Except as expressly set forth herein, no right, license, title, or interest in any of Add Health's intellectual property or in any invention, process, or product arising out of its intellectual property is granted or implied, whether or not patented or patentable.

L. This Agreement may be executed in one or more counterparts each of which counterpart shall be deemed an original Agreement and all of which shall constitute but one Agreement.

M. The parties' electronic signatures shall be the legally binding equivalent of a handwritten signature.

N. Institution hereby appoints Investigator as its designated representative to execute, on behalf of Investigator and Institution, additional forms pursuant to this Agreement. Such forms include Attachments A, B, C, and D.

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The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Investigator and Institutional Signatures

Investigator		Institutional Representative	
SIGNATURE	DATE 6/3/15	SIGNATURE	DATE 6/1/2015
NAME TYPED OR PRINTED	Peter B. Anderson	NAME TYPED OR PRINTED	Molly A. Lauck, Phd
TITLE	Professor, Core Faculty	TITLE	Director, Office of Research & Sponsored Programs
INSTITUTION	Walden University	INSTITUTION	Walden University
BUILDING ADDRESS		BUILDING ADDRESS	
STREET ADDRESS		STREET ADDRESS	100 Washington Avenue South, Suite 900
CITY, STATE ZIP		CITY, STATE ZIP	Minneapolis, MN 55401

Representative of Add Health

6/30/15

SIGNATURE DATE

Kathleen Mullan Harris
Principal Investigator
Carolina Population Center
206 West Franklin Street
Chapel Hill, NC 27516-2524

Representative of UNC-CH

7 July 2015

SIGNATURE for: DATE

for Barbara Entwisle
Vice Chancellor for Research
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-1350

For Add Health Use Only:

Security Plan & Contract Period: ____________________ through ____________________

Add Health
Carolina Population Center
University of North Carolina at Chapel Hill
206 West Franklin St

Chapel Hill, NC 27516

July 8, 2015

Dear Dr. Anderson,

A fully executed copy of your Add Health Restricted Use Data Contract from the National Longitudinal Study of Adolescent and Adult Health (Add Health). Your Add Health Restricted-Use Data contract have been approved to use the data from July 15th, 2015 – July 14th, 2018.

Please note that an annual report should be submitted to Add Health on or before each anniversary of the initial date of the Contract Period. All staff additions and changes to the storage and access of the restricted-use data must first be approved by Add Health. Thanks for your help to ensure the confidentiality, integrity and availability of the Add Health data.

An updated Certificate of Confidentiality has been included with your contract.

Please let us know if you have any questions or if we can be of additional assistance by phone at (919) 962-6100, or e-mail, addhealth_contracts@unc.edu.

More information about Add Health and Restricted-Use data can be found at our website: http://www.cpc.unc.edu/projects/addhealth

Sincerely,

Maria Marrufo
Add Health Contracts Carolina Population Center 206 West Franklin Street #237 Chapel Hill, NC 27516

(919) 962-6094 addhealth_contracts@unc.edu

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Instructions for Completing Attachment A: Sensitive Data Security Plan

Below are a number of different locations where you might choose to store the Add Health data. Please make your selection and then read the associated document "How to secure ..." from our web site to see the essential components of a good security plan for that location. Submit the completed Attachment A: Form to Describe Sensitive Data Security Plan for your location.

If your location is not listed, or if you need assistance with the security plan, please email addhealth@unc.edu.

Data Stored on a Stand-Alone Computer

A stand-alone computer is one that is in no way connected to another computer or networked device such as a switch, hub, or router.

The security plan form and information on how to secure a stand-alone computer are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/standalone.

Data Stored on an External Hard Drive

The external hard drive is a modified version of the stand-alone computer, in effect keeping the Add Health data off the Internet or a local area network (LAN).

The security plan form and information on how to secure an external hard drive are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/externaldrive

Data Stored on a Computer Connected to a Private Network

A private network is two or more computers and/or network devices (e.g., printer, switch, hub, router) that are not connected in any way to the Internet or a LAN.

The security plan form and information on how to secure a computer connected to a private network are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/privatenetwork

Data Stored on a Windows Computer Connected to Network

A network is two or more computers and/or network devices (e.g., printer, switch, hub, router) that are connected to the Internet or a LAN.

The security plan form and information on how to secure a Windows computer connected to a network are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/windowsnetwork

Data Stored on a Macintosh Computer Connected to Network

A network is two or more computers and/or network devices (e.g., printer, switch, hub, router) that are connected to the Internet or a LAN.

The security plan form and information on how to secure a Macintosh computer connected to a network are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/macnetwork

Instructions for Completing Attachment A: Sensitive Data Security Plan
(continued)

Data Stored on a Windows Server

Because the Windows server is connected to the Internet or to a local or wide area network, the emphasis for securing the data on this server is placed on physical security of the server, controlling access to the data, and protecting the data from unauthorized access across the wire.

The security plan form and information on how to secure a Windows server are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/win2000server

Data Stored on a NetWare Server

Because the NetWare server is connected to the Internet or to a local or wide area network, the emphasis for securing the data on this server is placed on physical security of the server, controlling access to the data, and protecting the data from unauthorized access across the wire.

The security plan form and information on how to secure a NetWare server are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/netwareserver

Data Stored on a Unix or Linux Server

Guidelines for securing a server that is running a version of the Unix or Linux operating system.

The security plan form and information on how to secure a Unix or Linux server are available at http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/security/unixlinux

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Attachment A
Form to Describe Sensitive Data Security Plan
For the Use of Sensitive Data from the
National Longitudinal Study of Adolescent to Adult Health
Data Stored on a Stand-Alone Computer

All requests for data must include the following information.

I. General Information

1. List below the name(s) and responsibilities of the investigator(s) and the research staff (students, research assistants, and programmers) who will have access to the data. Changes in personnel require that this information be updated.

2. Each project participant must sign a separate security pledge to be included with the contract. As new personnel are added during the period of this contract an amended Attachment C and new security pledges must be obtained and sent to the Carolina Population Center. A security pledge form can be found under Attachment D. Please copy for each participant.

Number of security pledges included:

3. Only one complete copy of the Add Health data is permitted; however, time-delimited temporary data analysis files may be created. Temporary data analysis file(s) must be deleted every six months and recreated, as necessary, to complete analysis. Temporary data analysis files should be deleted upon completion of a project.

All temporary data analysis files will be deleted and every year.

month month

4. Add Health data, including temporary data analysis files or subsets of the data, may not be copied to other media such as CDs or diskettes to be used on other machines and platforms. All Add Health data must remain in the same secure location as the one copy of the original Add Health data.

I agree to this condition

____
Investigator initial
Date:

5. The time frame for analysis of the data should not exceed three years from the date that data files originally were sent to the investigator. Research projects requiring the data for more than three years should submit annual requests for continuation three months prior to the end date of the current project. Data, paper and electronic, shall be destroyed on that date unless prior arrangements have been made with Add Health.

I agree to this condition.

____
Investigator initial

II. Detailed description of computer system where data will be stored and analyzed

1. What type of hardware/operating system will be used?

2. What is the physical location of the hardware?

3. How are backups handled, and how will Add Health data be excluded from the backup routine?

4. Who has physical access to the equipment?

5. Who has permission to use the equipment?

6. Is the equipment used by other projects?

7. Where will hard copy info be printed?

8. How will hard copy data be handled/stored/discarded?

Date:

What is the secure storage location (building, room number, and type of storage unit) of the original data CD?

III. Security system to prevent unauthorized access to the data

see email below

The following are minimum steps that should be taken to secure your stand-alone computer that houses the Add Health data. Please indicate below each security step you have implemented. Please write a short explanation if you cannot implement a specific step.

Physical Security of a Stand-Alone Computer

I configured the BIOS to boot the computer from the hard drive only. I will not allow the stand-alone computer to be booted from the diskette or CD-ROM drive.

Implemented   Not Implemented (please explain why not)

2. I password protected the BIOS so changes cannot be made to the BIOS without authorization.
Implemented Not Implemented (please explain why not)

I secured the computer on which the Add Health data resides in a locked room, or secured the computer to a table with a lock and cable (locking the case so the battery cannot be removed).

Implemented   Not Implemented (please explain why not)

4. I removed or disabled the network interface card (NIC) so it cannot be used.

Implemented   Not Implemented (please explain why not)

Date:

Controlling Access to the Data

I restricted access to the Add Health data to project personnel using the security features available via the operating system (e.g., login via userid/password and NTFS permissions in Windows 7/8, ACLs in Linux and OS X).

Implemented Not Implemented (please explain why not)

2. I require strong passwords.

Implemented Not Implemented (please explain why not)

3. I activated a screen saver with password after three minutes of inactivity.

Implemented Not Implemented (please explain why not)

4. I enabled encryption for directories containing secure data (e.g., Windows 7/8 encryption).

Implemented Not Implemented (please explain why not)

Name of encryption software

I configured my statistical applications to point the temporary working files to the secured data directory.

Implemented Not Implemented (please explain why not)

Date:

Location of secured directory

I installed and periodically run a secure erasure program. This program will be run monthly and after the secure data has been removed from the computer at the end of the contract period.

Implemented Not Implemented (please explain why not)

Name of secure erasure software

7. I will not copy or move the Add Health data out of the secured directory for any reason.

I agree to this condition.

Investigator initial

____
Investigator (or system administrator) initial

From: Diana Wilkerson
To: Marrufo, Maria Francia
Cc: Peter B. Anderson
Subject: Re: A question about the contractual agreement.
Date: Thursday, June 25, 2015 6:53:43 PM
Attachments: Husband Security Pledge.PDF
Adjusted Data Security Plan - Stand Alone Computer.pdf

Dear Maria,

Thank you for your time and support.

Here are my answers to your valuable questions:

Can you describe how is your office set up?

We have a four-bedroom house. My office is the farthest room from the living area. It is a room with one door and one double-window (two layers of glass). I installed a key lock on the door. Both keys of the lock are in my possession. The window has two layers. Each glass layer has a lock. I installed a lock that prevents the window from being open more than three inches.

In my office, I have a desk, folders cabinet, and a closet. In addition to a printer, I have two PCs; one is my personal PC, which is connected to the Internet and the other is a new computer that I will not use for any task except data analysis. The later is not connected to the internet. My office/house is located in a quiet and safe neighborhood. The address of my office/house is 300 Cerro De Ortega Dr SE. Rio Rancho, NM 87124

Who help you setting up your computer?

I hired a networks security expert. His name is Gary A. Rhoades. His email address is XXX. His phone # XXX

Mr. Rhoades went through each requirement and did exactly what is needed. In addition, he assured that I understand each setting and its requirements.

Will your husband use that computer too?

My husband has his own study/office and his own computer(s). Neither my husband nor I use any but our own personal computers. Moreover, all the computers in the

house are secured with strong passwords. I do not know my husband's passwords

and vice versa.

Will your husband use that office?

As I noted earlier, we have a four-bedroom house. Gary has his own study; he does not enter into my office.

- Can you specify the home address? Just because security plan gets detached from the entire contract and our team don't get to see the front page.

Sure !

- I noticed in your original plan that you said you will NOT back up the Add Health data, which we appreciate. However, I wanted to make sure that you know you should backup your programming code and documentation, not Add Health Data. That way, if the computer dies, you can rebuild, install original data and then rerun your SAS/Stata/SPSS code to recreate your temporary analysis files.

Thank you! I excluded all data files (this is, currently, set to the location that I will download the data files into) from the backup/file history.

- Do you have in the Stand Alone computer install SAS/STATA OR SPSS to do your data analysis?

Yes, I installed AMOS SPSS and SPSS into the PC.

- Use Bitlocker as your encryption software. Please follow instructions how to installhttp://windows.microsoft.com/en-us/windows-8/bitlocker-drive-encryption

Thank you! Mr. Rhoades has installed Windows Encrypting File System on that computer.

- Did you already buy R-Wipe&Clean secure erasure software? If you haven't buy it yet. This is what we use to securely delete files. http://www.fileshredder.org/

Yes, I did. Here is the order confirmation email:

"Please print out a copy of this order page and keep a record of your Order ID. R-tools Technology Inc.

10520 Yonge Street, Unit 35B, Suite 232

Richmond Hill, ON, L4C 3C7, CANADA Order ID: WP86RXTLCMBN

Please reference this number when contacting our sales representatives to aid in them in their efforts to assist you.

Order Placed and Paid: Wednesday, 06-May-15 10:23 AM Product: R-Wipe&Clean - 1 copy

Unit Price: 28.99 USD

Downloadable Package Price: 28.99 USD Shipping and Handling: 0.00 USD

Tax Amount: 0.00 USD

Total amount of Transaction: 28.99 USD VISA XXXXXXXX2088

Bill to:

Walden University Diana

According to your guidance, I adjusted the field of the physical location of the hardware.

Please find attached the adjusted data security plan and my husband's Security Pledge.

Please let me know if you need further clarifications.

Thank you!

Kind regards.

Yours,

Diana

On Thu, Jun 25, 2015 at 1:39 PM, Marrufo, Maria Francia <marrufo@email.unc.edu> wrote:

Please see attached previous security plan. feel free to provide any information in the blank boxes.

Also, please have your husband fill and sign a Security Pledge. See attached pdf.

I will be out of the office tomorrow, but feel free to email anytime.

Best,

Maria Marrufo

Add Health Contracts

Carolina Population Center

206 West Franklin Street #237

Chapel Hill, NC 27516

addhealth_contracts@unc.edu

General questions about Add Health contracts? Check out our FAQs at

http://www.cpc.unc.edu/projects/addhealth/faqs/contract

From: Add Health Contracts

Sent: Thursday, June 25, 2015 3:36 PM

To: 'Diana Wilkerson'

Subject: RE: A question about the contractual agreement.

Dear Wilkerson,

Thank you for calling today and follow up on my email.

I met with our security team and we would like for you to add more information in the security plan. Please see questions below and also in the security plan.

Can you describe how is your office set up?

Who help you setting up your computer?

Will your husband use that computer too?

Will your husband use that office?

Can you specify the home address? Just because security plan gets detached from the entire contract and our team don't get to see the front page.

I noticed in your original plan that you said you will NOT back up the Add Health data, which we appreciate. However, I wanted to make sure that you know you should backup your programming code and documentation, not Add Health Data. That way, if the computer dies, you can rebuild, install original data and then rerun your SAS/Stata/SPSS code to recreate your temporary analysis files.

Do you have in the Stand Alone computer install SAS/STATA OR SPSS to do your data analysis?

Use Bitlocker as your encryption software. Please follow instructions how to install http://windows.microsoft.com/en-us/windows-8/bitlocker-drive-encryption

Did you already buy R-Wipe&Clean secure erasure software? If you haven't buy it yet. This is what we use to securely delete files. http://www.fileshredder.org/

Feel free to add any information that can be helpful in the security plan. We want to make sure we record as much information of your home office set up in order to approve the security plan.

Let me know if you have any questions or concerns.

Best,

Maria Marrufo

Add Health Contracts

Carolina Population Center

206 West Franklin Street #237

Chapel Hill, NC 27516

addhealth_contracts@unc.edu

General questions about Add Health contracts? Check out our FAQs at http://www.cpc.unc.edu/projects/addhealth/faqs/contract

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Attachment B: Data File Order Form

- Data will be delivered as a SAS export file.
- Data will be sent on a CD by second day, traceable delivery and the Investigator will be notified by email when the data are shipped.
- All data files will be compressed and encrypted.
- Codebooks will be delivered in electronic form on a CD.

Diana F. Wilkerson	Peter B. Anderson
CONTACT PERSON	INVESTIGATOR'S NAME
CONTACT PERSON'S EMAIL	INVESTIGATOR'S SIGNATURE
	5/11/15
	DATE OF SIGNATURE

The following data will be sent automatically, upon execution of your contract:

In-home Interview Files
- Wave I
- Wave II
- Wave III
- Wave IV

School Files
- Wave I School Administrator
- Wave II School Administrator
- School Information
- In-School Questionnaire

Weight Files
- Wave I Grand Sample Weights
- Wave II Grand Sample Weights
- Wave III Grand Sample Weights
- Wave IV Grand Sample Weights
- School Administrator Weights
- In-School Weights

The constructed datasets listed below are available by special request.

In order to receive one or more of these datasets,
please attach a brief statement explaining the necessity and relevance of the data to your research agenda.

School Files
- ☐ School Network
- ☐ Network Structure

Friend Files
- ☐ In-School Nominations
- ☐ Wave I In-Home Nominations
- ☐ Wave II In-Home Nominations
- ☐ Wave III Friend IDs

Sibling Files
- ☐ Adolescent Pair Data
- ☐ Wave III Sibling IDs

Contextual Files
- ☐ Wave I Contextual
- ☐ Wave II Contextual
- ☐ Wave III Contextual
- ☐ Wave I Neighborhood
- ☐ Wave II Neighborhood
- ☐ Wave III Grouping
- ☐ Wave IV Grouping
- ☐ Wave I Spatial
- ☐ Wave III Census Region
- ☐ Wave IV Census Region
- ☐ Wave III Tract-Level
- ☐ Wave IV Tract-Level

Wave III Supplemental Files
- ☐ Urinalysis
- ☐ ASHA Call
- ☐ HPV MGEN
- ☐ Mentor Codes
- ☐ BEM Scores
- ☐ Cotinine

Weight Files
- ☐ Wave I Weight Components
- ☐ Wave II Weight Components
- ☐ Wave III Weight Components
- ☐ Wave IV Weight Components
- ☐ In-School Weight Components
- ☐ Add Health School Weights
- ☐ HPV MGEN Weights

Attachment B: Data File Order Form

Education Files (Wave III)
- ☐ Academic Courses
- ☐ Academic Networks
- ☐ Context
- ☐ Course Level
- ☐ Curriculum
- ☐ Linking
- ☐ Primary
- ☐ Transition
- ☐ Weights

Genetic Files
- ☐ Wave III DNA Results
- ☐ Wave IV DNA Results

Constructed Variables
- ☐ Wave IV Constructed

Disposition Files
- ☐ Wave I Disposition
- ☐ Wave II Disposition
- ☐ Wave III Disposition
- ☐ Wave IV Disposition
- ☐ National Death Index

Obesity and Neighborhood Environment (ONE)
- ☐ Wave I Climate
- ☐ Wave III Climate
- ☐ Wave I Street Connectivity
- ☐ Wave III Street Connectivity
- ☐ Wave I Crime
- ☐ Wave III Crime
- ☐ Wave I Geocode Source
- ☐ Wave III Geocode Source
- ☐ Wave I Land Cover
- ☐ Wave III Land Cover
- ☐ Wave I Parks
- ☐ Wave III Parks
- ☐ Wave I Urban Distances
- ☐ Wave III Urban Distances
- ☐ Wave I Resources
- ☐ Wave III Resources
- ☐ Wave I Weather
- ☐ Wave III Weather
- ☐ Wave I ACCRA Cost of Living Index
- ☐ Wave III ACCRA Cost of Living Index
- ☐ Wave I Employment
- ☐ Wave III Employment
- ☐ Wave I Length of Day
- ☐ Wave III Length of Day
- ☐ Wave I Road Type Length
- ☐ Wave III Road Type Length
- ☐ Wave I Rural-Urban Commuting Area (RUCA)
- ☐ Wave III Rural-Urban Commuting Area (RUCA)
- ☐ Wave I 1990 Population Density
- ☐ Wave III 2000 Population Density
- ☐ Wave I School Distance Measures
- ☐ Wave I Grouping
- ☐ Wave III Mobility
- ☐ Wave III MSA

Alcohol Density Files
- ☐ Wave III Alcohol Outlet Density

Political Context Files
- ☐ Wave I Political Context Data
- ☐ Wave II Political Context Data
- ☐ Wave III Political Context Data

Biomarker Data (Wave IV)
- ☐ Prescription Medication Use
- ☐ Glucose
- ☐ Measures of EBV and hsCRP
- ☐ Biomarker Consent
- ☐ Lipids
- ☐ Baroreceptor Sensitivity

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Description of Data Files

Wave I In-home—A merged file containing the Wave I In-home Interview data, the Parent Questionnaire data (when available), the In-school Questionnaire data (when available), and the Add Health Picture Vocabulary Test (when available), collected in 1994-1995, weights included.

Wave II In-home—Data collected during the 1996 in-home interview, and weights included.

Wave III In-home—Respondent-level data collected during the 2001-2002 in-home interview includes field interviewer characteristics, AHPVT, and weights.

Wave IV In-home—The Wave IV in-home interview file includes the Wave IV interview data and interviewer demographic information.

Wave I School Administrator—Information from the Wave I self-administered questionnaire answered by an administrator at the school.

Wave II School Administrator—Information from the Wave II phone-administered interview answered by an administrator at the school.

School Information—Additional information about the individual schools.

In-school Questionnaire—Adolescent responses to the In-school Questionnaire administered September 1994 through April 1995.

School Files

School Network—Network variables constructed from the in-school questionnaire data and friendship nominations.

Network Structure—For each school pair, these files contain a valued friendship network and information on sex, grade in school, race, school pair, and total number of nominations made, including those to non-matchable or out-of-school friends. The files are stored as arc/edge lists in the PAJEK.PAJ format. Information on this freely available network software is at http://vlado.fmf.uni-lj.si/pub/networks/pajek/

Friend Files

In-School Nominations—Identification numbers of the friends that the respondent nominated during the in-school questionnaire.

Wave I In-home Nominations—Identification numbers of the friends that the respondent nominated during the Wave I in-home interview.

Wave II In-home Nominations—Identification numbers of the friends that the respondent nominated during the Wave II in-home interview.

Wave III Friend IDs—In Wave III, respondents in the 7th or 8th grade at Wave I were asked to identify, from a list of 10 computer-generated names, which ones were current friends or which ones were their friends when they were in school together. This dataset contains the IDs of the 10 computer-generated names.

Description of Data Files
(continued)

Sibling Files

Adolescent Pair Data—Information that links and describes the sibling pairs.

Wave III Sibling IDs—In Wave III, respondents were asked questions about their siblings who also participated in the Wave I or II in-home interviews; this dataset contains the IDs for these siblings.

Contextual Files

Waves I, II and III Contextual—Community contextual variables based on state, county, tract, and block group levels derived from the Waves I, II and III addresses.

Waves I and II Neighborhood—Pseudo state, county, tract, and block group variables that allow respondents to be aggregated geographically based on Waves I and II addresses.

Waves III and IV Grouping—The pseudo FIPS codes in this file allow you to geographically group respondents by their Wave IV locations.

Wave I Spatial—X, Y coordinates that can be used to calculate distances between friends in a school community.

Waves III and IV Region—This file contains the Census region codes for the respondents' Wave III and IV residential locations.

Wave III Supplemental Tract-Level Contextual—This file contains supplemental Wave III contextual data that include transportation and commuting measures, climate descriptors, amenities, and state-level tobacco control influences. These variables are available at the census tract-level unless otherwise specified.

Wave IV Supplemental Tract-Level Contextual—This file contains tract-level measures, based on the Wave IV respondent locations, reported by the U.S. Census Bureau's 2009 American Community Survey (ACS), the Climate Atlas of the United States, the USDA Economics Research Service, Esri Data and Maps, ImpacTeen Tobacco Control Policy and Prevalence Data, and the Uniform Crime Reports. When tract-level measures were not available or appropriate, state and county level variables were used.

Wave III Supplemental Files

Urinalysis—This file contains nitrate, specific gravity, pH level, white blood cells, protein, glucose, ketone, urobilinogen, bilirubin, microalbumin, urine creatinine, and blood values from the Wave III urine specimens.

ASHA Call—To receive the results of their STD assays, Wave III respondents called an Add Health dedicated number at the American Social Health Association. This file provides information on who called the results hotline and the date and time of the call.

HPV MGEN—Assay results for human papillomavirus and mycoplasma genitalium are available for a subset of the Wave III respondents who provided a urine sample.

Mentor Codes—For Wave III respondents who reported having a mentor, the open-ended responses to the question "How did {HE/SHE} help you?" have been coded and are available in this file.

BEM Scores—The masculinity and femininity raw and standard scores from the 30 item short form BEM Sex-Role Inventory are available in this file.

Cotinine—This file contains the cotinine and 3-hydroxycotinine assay values for 963 Wave III respondents.

Description of Data Files

(continued)

Disposition Files

Wave I and II Disposition File— Participation information for the Wave I in-home interview respondents and outcome data on the Wave II fielded cases.

Wave III Disposition File— Outcome information on the Wave III fielded cases.

Wave IV Disposition File— Outcome information on the Wave IV fielded cases.

National Death Index—Cause of death for the cases reported deceased at Waves III and IV are in this file.

Constructed Variables

Wave IV Constructed Variables— Wave IV constructed variables on personality, stress, depression, smoking, drinking, sexual activity, health, and economics.

The Obesity and Neighborhood Environment (ONE)

Wave I and III Climate— This file contains climate data for each Wave I and Wave III respondent based on the nearest climate station. Information is available on precipitation, total snowfall, sky cover, temperature, and total hours of sunshine.

Wave I and III Street Connectivity—These files contain road network connectivity measures within 1, 3, 5, and 8.05 km (5 miles) of the Wave I and III respondent locations.

Wave I and III Crime—The county level crime data in these files are based on the Wave I and III respondent locations.

Wave I and III Geocode Source—The data sources of the Wave I and III respondent residential geocodes (latitude and longitude) are provided in these files.

Wave I and III Land Cover—These files contain land cover metrics within 1, 3, 5, and 8.05 km (5 miles) of each respondent's location.

Wave I and III Parks—The counts of public parks within a Euclidean distance of 1, 3, 5, and 8.05 km (5 miles) of each respondent at Wave I and III are in these files.

Wave I and III Resources—The Add Health files provide data on the presence of various physical activity (PA) resources situated near respondent residences at Wave I and III.

Wave I and III Urban Distances—W1URBDST contains Euclidean distances to both 1990 and 2000 U.S. Census Urbanized Areas (UAs) for each Wave I respondent. W3URBDST contains the Euclidean distance to 2000 U.S. Census-Bureau-defined urbanized areas (UAs) for each Wave III respondent.

Wave I and III Weather—This file contains weather data for each Wave III respondent based on the nearest weather station reporting data for the correspondent survey month and year.

Wave I and III ACCRA Cost of Living Index—These Add Health Data Files contain ACCRA Cost of Living Index based on the location of the Wave I and Wave III respondents.

Wave I and III Employment—These Data Files contain county-level employment data attached to each Wave I and Wave III respondent location.

Description of Data Files

(continued)

<u>Disposition Files</u>

Wave I and II Disposition File— Participation information for the Wave I in-home interview respondents and outcome data on the Wave II fielded cases.

Wave III Disposition File— Outcome information on the Wave III fielded cases.

Wave IV Disposition File— Outcome information on the Wave IV fielded cases.

National Death Index—Cause of death for the cases reported deceased at Waves III and IV are in this file.

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Wave I and III Weather—This file contains weather data for each Wave III respondent based on the nearest weather station reporting data for the correspondent survey month and year.

Wave I and III ACCRA Cost of Living Index—These Add Health Data Files contain ACCRA Cost of Living Index based on the location of the Wave I and Wave III respondents.

Wave I and III Employment—These Data Files contain county-level employment data attached to each Wave I and Wave III respondent location.

Description of Data Files

(continued)

Wave I and III Length of Day—These Data Files contain the number of hours of daylight at each Wave I and Wave III respondent location on that respondent's survey date.

Wave I and III Road Type Length—These Data Files contain road type length calculations within radii of 1, 3, 5, and 8.05 kilometers (5 miles) of Wave I and Wave III respondent locations.

Wave I and III Rural-Urban Commuting Area (RUCA)—These Data Files contain Rural-Urban commuting area (RUCA) codes at the U.S. Census tract-level based on the location of Wave I and Wave III respondents.

Wave I and III Population Density—The Wave I population density file contains the proportion of 1990 U.S. Census block group population and area (in square meters) within 1, 3, 5, and 8.04672 km (5 mi) of each Wave I respondent. The Wave III population density file contains the proportion of 2000 U.S. Census block group population and area (in square meters) within 1, 3, 5, and 8.04672 km (5 mi) of each Wave III respondent.

Wave I School Distance Measures—The file contains the distance between the geocoded point locations of each respondent's Wave I location and that respondent's school.

Wave I Grouping—This Wave I grouping file is for use with the Obesity and Neighborhood Environment (ONE) data. The Wave I data in the ONE contextual files were created using these Wave I respondent locations. The grouping variable in this file is based on the Census FIPS codes and is a pseudo code, not linkable to outside data sources.

Wave III Mobility—W3MOBIND reports the distance between each respondent's geocoded point location for each survey wave and that respondent's school location, along with the respondent's move distance between each survey wave.

Wave III MSA Pseudo Codes—The MSA pseudo code created for each respondent's Wave III location is in this file.

Alcohol Density Files

Wave III Alcohol Outlet Density—This Add Health Data File measures the prevalence of alcohol outlets in respondent communities by reporting the tract-level density of establishments possessing on-and/or off-premise alcohol licenses.

Political Context Files

Wave I, II, III Political Context Data—The Add Health Political Context Database provides an array of measures that describe the political environments in which Add Health respondents reside. These contextual variables include measures of commuting, election results for gubernatorial, presidential, and senatorial races, and voter registration law.

Wave IV Biomarker Data

Prescription Medication Use—The files contained in this component of the Add Health restricted data include the type of medication used by participants during Wave IV.

Glucose—This file contains two measures of glucose homeostasis based on the assay of the Wave IV dried blood spots.

EBV and hsCRP Data—The results of the assays for CRP (C-reactive protein) and EBV (Epstein-Barr virus) are in this Data File.

Description of Data Files

(continued)

Biomarker Consent—In this file are variables indicating the types of consent (archive, no archive, refused, incarcerated) obtained for the Wave IV blood spot and saliva DNA collections.

Lipids—The Lipids data file contains measures of triglycerides (TG), total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), non-high-density lipoprotein cholesterol, and total cholesterol to high-density lipoprotein cholesterol ratio.

Baroreceptor Sensitivity—This file contains constructed measures for baroreflex sensitivity, heart rate recovery, and systolic blood pressure recovery for the Wave IV respondents.

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Attachment C: Supplemental Agreement with Research Staff

I. The undersigned Research Staff, in consideration of their use of sensitive data from the National Longitudinal Study of Adolescent Health, agree:

   A. That they have read the associated Agreement for the Use of Sensitive Data from the National Longitudinal Study of Adolescent Health and the Sensitive Data Security Plan.

   B. That they are "Research Staff" within the meaning of the Agreement.

   C. To comply fully with the terms of the Agreement, including the Sensitive Data Security Plan.

II. The undersigned Investigator agrees that the persons designated herein are Research Staff within the meaning of the associated Agreement for the Use of Sensitive Data from the National Longitudinal Study of Adolescent Health.

III. Investigator agrees to ensure that each Research Staff person signs this Supplemental Agreement and an individual Security Pledge (Attachment D).

Research Staff

NAME TYPED OR PRINTED	SIGNATURE	DATE
Diana F. Wilkerson	Diana W	6/2/2015

Investigator

NAME TYPED OR PRINTED	SIGNATURE	DATE
Peter B. Anderson	[illegible]	5/11/2015

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Attachment D: Security Pledge

Pledge of Confidentiality

I, Dr. Peter B. Anderson ,through my involvement with and work on my project
TYPE OR PRINT YOUR NAME

will have access to Sensitive Data collected by the National Longitudinal Study of Adolescent Health (Add Health). By virtue of my affiliation with this project, I have access to Sensitive Data about respondents generally perceived as personal and private. I understand that access to this Sensitive Data carries with it a responsibility to guard against unauthorized use and to abide by the Sensitive Data Security Plan. To treat information as confidential means to not divulge it to anyone who is not a project member, or cause it to be accessible to anyone who is not a project member. Anything not specifically named as "public information" is considered confidential.

Disclosing confidential information from Add Health directly or allowing non-authorized access to such information may subject you to criminal prosecution and/or civil recovery and may violate the code of research ethics of your institution.

I agree to fulfill my responsibilities on this project in accordance with the following guidelines:

1. I agree not to permit non-project personnel access to these Sensitive Data, in either electronic or paper copy.
2. I agree to not attempt to identify individuals, families, households, schools, geographic locations or institutions.
3. I agree that in the event the identity of an individual, family, household, school, geographic location or institution is discovered inadvertently, I will (a) make no use of this knowledge, (b) advise the Investigator of the incident who will report it to Kathleen Mullan Harris within one (1) business day of discovery, (c) safeguard or destroy the information as directed by the Investigator after consultation with Kathleen Mullan Harris, and (d) not inform any other person of the discovered identity.

Location (Building and Room Number) of the Computer that will be used to access the Add Health Restricted-Use data: 219 S Crimson Clover Circl. Spring TX 77381

Peter B. Anderson	[signature]	06/ 02 /2015
NAME	SIGNATURE	DATE

Updates and corrections to the Add Health data and codebooks will only be distributed through the Add Health list server.

EMAIL: Peter B. Anderson@Waldenu.edu
PROVIDE YOUR EMAIL ADDRESS TO SUBSCRIBE TO THIS LIST SERVER

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Attachment D: Security Pledge

Pledge of Confidentiality

I, Diana F. Wilkerson ,through my involvement with and work on my project
TYPE OR PRINT YOUR NAME

will have access to Sensitive Data collected by the National Longitudinal Study of Adolescent Health (Add Health). By virtue of my affiliation with this project, I have access to Sensitive Data about respondents generally perceived as personal and private. I understand that access to this Sensitive Data carries with it a responsibility to guard against unauthorized use and to abide by the Sensitive Data Security Plan. To treat information as confidential means to not divulge it to anyone who is not a project member, or cause it to be accessible to anyone who is not a project member. Anything not specifically named as "public information" is considered confidential.

Disclosing confidential information from Add Health directly or allowing non-authorized access to such information may subject you to criminal prosecution and/or civil recovery and may violate the code of research ethics of your institution.

I agree to fulfill my responsibilities on this project in accordance with the following guidelines:

1. I agree not to permit non-project personnel access to these Sensitive Data, in either electronic or paper copy.
2. I agree to not attempt to identify individuals, families, households, schools, geographic locations or institutions.
3. I agree that in the event the identity of an individual, family, household, school, geographic location or institution is discovered inadvertently, I will (a) make no use of this knowledge, (b) advise the Investigator of the incident who will report it to Kathleen Mullan Harris within one (1) business day of discovery, (c) safeguard or destroy the information as directed by the Investigator after consultation with Kathleen Mullan Harris, and (d) not inform any other person of the discovered identity.

Location (Building and Room Number) of the Computer that will be used to access the Add Health Restricted-Use data: 300 Cerro De Ortega Dr SE. Rio Rancho, NM 87124

Diana F. Wilkerson	Diana	6/2/2015
NAME	SIGNATURE	DATE

Updates and corrections to the Add Health data and codebooks will only be distributed through the Add Health list server.

EMAIL: diana.wilkerson@waldenu.edu
PROVIDE YOUR EMAIL ADDRESS TO SUBSCRIBE TO THIS LIST SERVER

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent to Adult Health
Restricted Use Data Contract

Attachment D: Security Pledge

Pledge of Confidentiality

I, GARY J. WILKERSON ,will not have access to the data collected by
TYPE OR PRINT YOUR NAME

the National Longitudinal Study of Adolescent to Adult Health (Add Health), although I share an office space with a Researcher who has a contract for the restricted-use dataset. I will not have access to confidential information and data about respondents generally perceived as personal and private, though I understand that my proximity to this confidential information and data carries with it a responsibility to guard against unauthorized use. To treat information as confidential means to not divulge it, record it, or cause it to be accessible to anyone who is not a project member. Anything not specifically named as "public information" is considered confidential.

Disclosing confidential information from Add Health directly or allowing non-authorized access to such information may subject you to criminal prosecution and/or civil recovery and may violate the code of research ethics of your institution.

I agree to the following guidelines:

1. I agree not to permit non-project personnel access to these Sensitive Data, in either electronic or paper copy.
2. I agree to not attempt to identify individuals, families, households, schools, geographic locations or institutions.
3. I agree that in the event the identity of an individual, family, household, school, geographic location or institution is discovered inadvertently, I will (a) make no use of this knowledge, (b) advise the Investigator of the incident who will report it to Kathleen Mullan Harris within one (1) business day of discovery, (c) safeguard or destroy the information as directed by the Investigator after consultation with Kathleen Mullan Harris, and (d) not inform any other person of the discovered identity.

GARY J. WILKERSON	Gary J. Wilkerson	6/25/2015
NAME	SIGNATURE	DATE

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Attachment E: List of Funding Agencies

National Cancer Institute

National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, DHHS

National Center for Minority Health and Health Disparities

National Institute on Aging

National Institute of Allergy and Infectious Diseases

National Institute of Deafness and Other Communication Disorders

National Institute of General Medical Sciences

National Institute of Mental Health

National Institute of Nursing Research

National Institute on Alcohol Abuse and Alcoholism

National Institute on Drug Abuse

National Science Foundation

Office of AIDS Research, National Institutes of Health, NIH

Office of the Assistant Secretary for Planning and Evaluation, DHHS

Office of Behavioral and Social Science Research, NIH

Office of the Director, NIH

Office of Minority Health, Centers for Disease Control and Prevention, DHHS

Office of Minority Health, Office of Public Health and Science, DHHS

Office of Population Affairs, DHHS

Office of Research on Women's Health, NIH

The University of North Carolina at Chapel Hill, Carolina Population Center
National Longitudinal Study of Adolescent Health
Restricted Use Data Contract

Attachment F: Description of Deductive Disclosure Risk

The problem of deductive disclosure of an individual respondent's identity has become a major concern of federal agencies, researchers, and Institutional Review Boards in the recent past. In essence, deductive disclosure is the discerning of an individual respondent's identity and responses through the use of known characteristics of that individual. This is not unique to Add Health—if a person is known to have participated in ANY survey, then a combination of his or her personal characteristics will allow an individual to determine which record corresponds to that individual. For example, in the Add Health in-school dataset of more than 90,000 cases, a cross-tabulation of five variables can distinguish an individual record.

The Add Health data is more sensitive than many other datasets to deductive disclosure. This is due, in part, to the clustered research design. Add Health surveyed all students in grades 7 through 12 in a pair of schools in each of 80 communities in the United States. The in-school questionnaires were administered by teachers at each school. More than 120,000 students were enrolled in these schools. Informational letters were sent to parents prior to the administration date via students and post. Assuming that most students live with two other persons (parents and/or siblings), 360,000 people know of the participation of at least one, if not many, of the adolescents attending the selected schools. Additionally, approximately 5,000 school administrators, staff and teachers were involved in the in-school data collection efforts.

The in-home selection process increased the number of persons aware of Add Health: about 5,000 participants in the in-home component had not completed an In-School Questionnaire. (Participation in the in-school session was not a prerequisite for eligibility, only the presence of an adolescent's name on the school enrollment roster.)

Given the large number of people who know someone who, they know, participated in Add Health, researchers who use the Add Health Contractual Dataset are obligated to protect respondents from deductive disclosure risk by taking extraordinary precautions to protect the data from non-authorized use. Precautions include, but are not limited to: copying the original dataset only once and storing the original CD-ROM in a locked drawer or file cabinet; saving the computer programs used to construct analysis data files, but not the Data Files themselves; retrieving paper printouts immediately upon output; shredding printouts no longer in use; password protecting Add Health data; signing pledges of confidentiality; and using the data solely for statistical reporting and analysis.

CERTIFICATE OF CONFIDENTIALITY
CC-HD-14-76
issued to
University of North Carolina at Chapel Hill
conducting research known as
National Longitudinal Study of Adolescent to Adult Health (Add Health) aka Add Health Program Project Wave V

In accordance with the provisions of section 301(d) of the Public Health Service Act 42 U.S.C. 241(d), this Certificate is

is

e I is

supported by the National Institute on Aging.

Under the authority vested in the Secretary of Health and Human Services by section 301(d), all persons who:

1. are enrolled in, employed by, or associated with the University of North Carolina at Chapel Hill and their contractors or cooperating agencies and

2. have in the course of their employment or association access to information that would identify individuals who are the subjects of the research pertaining to the project known as National Longitudinal Study of Adolescent to Adult Health (Add Health) aka Add Health Program Project Wave V

are hereby authorized to protect the privacy of the individuals who are the subjects of that research by withholding their names and other identifying characteristics from all persons not connected with the conduct of that research.

collection and spatial data of original Wave I Add in their fourth decade of life (ages 31-42). and will link a subset of respondents born in six states. In addition, Add Health Parent Study: Phase I will collect survey, biomarker and spatial data on ~ 4,600 Add Health parents and their current spouses or partners. The Add Health Parent Study Phase I is a component part of Add Health.

A Certificate of Confidentiality is needed because sensitive information will be collected during the course of the study. The certificate will help researchers avoid involuntary disclosure that could expose subjects or their families to adverse economic, legal, psychological and social consequences.

All subjects will be assigned a code number and identifying information and records will be kept in locked files at the Institution.

This research is currently underway and is expected to end on 04/30/2019.

As provided in section 301 (d) of the Public Health Service Act 42 U.S.C. 241(d):

'Persons so authorized to protect the privacy of such individuals may not be compelled in any Federal, State, or local civil, criminal, administrative, legislative, or other proceedings to identify such individuals.'

This Certificate does not protect you from being compelled to make disclosures that: (1) have been consented to in writing by the research subject or the subject's legally authorized representative; (2) are required by the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or regulations issued under that Act; or (3) have been requested from a research project funded by the National Institutes of Health (NIH) or the Department of Health and Human Services (DHHS) by authorized representatives of those agencies for the purpose ‹ f audit or program review.

CERTIFICATE OF CONFIDENTIALITY
CC-HD-14-76
issued to
University of North Carolina at Chapel Hill
conducting research known as
National Longitudinal Study of Adolescent to Adult Health (Add Health) aka Add Health Program Project Wave V

This Certificate does not represent an endorsement of the research project by the DHHS. This Certificate is now in effect and will expire on 04/30/2019. The protection afforded by this Confidentiality Certificate is permanent with respect to subjects who participate in the research during the time the Certificate is in effect.

Date: 8/11/2014

Steven PhD
Associate for Clinical Research
Eunice Kennedy Shriver National Institute of Child Health and Human Development

Dear Ms. Wilkerson,

This email is to notify you that the Institutional Review Board (IRB) confirms that your study entitled, "Youth Assault-Injury Variation Patterns and Their Dimensional Structure," meets Walden University's ethical standards, conditional upon the approval of the community research partner, as documented in a notification of approval. Walden's IRB approval only goes into effect once the Walden IRB confirms receipt of that notification of approval. Our records indicate that you will be analyzing data provided to you by UNC at Chapel Hills as collected under its oversight. Since this study will serve as a Walden doctoral capstone, the Walden IRB will oversee your capstone data analysis and results reporting. The IRB approval number for this study is 05-18-15-0265179.

This confirmation is contingent upon your adherence to the exact procedures described in the final version of the documents that have been submitted to IRB@waldenu.edu as of this date. This includes maintaining your current status with the university and the oversight relationship is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, this is suspended.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB materials, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden
website: http://academicguides.waldenu.edu/researchcenter/orec

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Please note that this letter indicates that the IRB has confirmed your study meets Walden University's ethical standards. You may not begin the doctoral study analysis phase of your doctoral study, however, until you have received the **Notification of Approval to Conduct Research** e-mail. Once you have received this notification by email, you may begin your study's data analysis.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,
Libby Munson
Research Ethics Support Specialist
Office of Research Ethics and Compliance
Email: irb@waldenu.edu
Fax: 626-605-0472
Phone: 612-312-1283

Office address for Walden University:
100 Washington Avenue South, Suite 900
Minneapolis, MN 55401

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: http://academicguides.waldenu.edu/researchcenter/orec

From: Peter B. Anderson

To: Add Health Contracts

Cc: Diana Wilkerson

Subject: RE: Confirmation of Receipt of Community Partner Approval - Diana Wilkerson

Date: Friday, July 31, 2015 4:20:41 PM

Maria,

This is not exempt – the expiration date is 1 year from the approval date of 7/16/15. Please let me know if you need any additional information. Thanks again for all your work on this and help to make the process manageable for us.

Peace,

Pete

Peter B. Anderson, Ph.D., FSSSS, Professor Core Faculty,

Ph.D. in Public Health College of Health Sciences Walden University

100 Washington Ave. South Minneapolis, MN 55401

Office (Toll Free) 800-925-3368 ex. 1011448 Peter.Anderson@Waldenu.edu

From: Add Health Contracts [mailto:addhealth_contracts@unc.edu] Sent: Friday, July 31, 2015 3:02 PM
To: Peter B. Anderson
Cc: Diana Wilkerson
Subject: RE: Confirmation of Receipt of Community Partner Approval - Diana Wilkerson

Dear Dr. Anderson,

This will work thank you so much. Also, I was wondering if you have an expiration date or if it categorize as EXEMPT?

Thank you so much,

Maria

Maria Marrufo

Add Health Contracts Carolina Population Center 206 West Franklin Street #237 Chapel Hill, NC 27516

addhealth_contracts@unc.edu

General questions about Add Health contracts? Check out our FAQs at

http://www.cpc.unc.edu/projects/addhealth/faqs/contract

From: IRB [mailto:IRB@waldenu.edu]
Sent: Thursday, July 16, 2015 12:10 PM To: Diana Wilkerson
Cc: Peter B. Anderson

Subject: Confirmation of Receipt of Community Partner Approval - Diana Wilkerson

Dear Ms. Wilkerson,

This email confirms receipt of the approval notification for the community research partner. As such, you are hereby approved to conduct research with this organization.

Congratulations!

Libby Munson

Research Ethics Support Specialist, Office of Research Ethics and Compliance

Leilani Endicott
IRB Chair, Walden University

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: http://academicguides.waldenu.edu/researchcenter/orec

To Add Health 6/02/ 2015
The University of North Carolina at Chapel Hill
Carolina Population Center
206 West Franklin Street
Chapel Hill, NC 27516-252

Dear Mrs. Sauls,

I would like to request the Add Health restricted-use data of Wave II in-home interview for my student Diana Wilkerson. Diana is conducting a dissertation on "Youth Assault-Injury Variation Patterns and their Dimensional Structure." The restricted-use data of Wave II is the most appropriate for her study.

I want to clarify some areas in the Restricted Use Data Contract:

- As you may know, Walden is an online University. Therefore, in the contract, you will find various physical addresses. These addresses include the location of data storage and use, which is at my student's house, our Walden University main address, and the shipping address for the dataset, which is my home address.
- No agency is funding the study; Diana is paying for her dissertation expenses.
- Since Walden IRB's policy requires your agreement on supplying the data, the IRB granted a conditional approval for the dissertation. As soon as we receive your authorization, Walden IRB will change the conditional to a complete approval. I will email this approval shortly after your authorization.
- As the dissertation Chairperson, I will continue supervising this study to assure adherence to your requirements. I am certain that this study will make a positive contribution to our knowledge about youth assault-injury.

Should you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Peter B. Anderson, Ph.D., FSSSS, Professor
Core Faculty,
Ph.D. in Public Health
College of Health Sciences
Walden University
100 Washington Ave. South
Minneapolis, MN 55401
Office (Toll Free) 800-925-3368 ex. 1011448
Peter.Anderson@Waldenu.edu

Attachments:
1- The Restricted Use Data Contract and its attachments: A-B-C-D-E-F.
2- The required ($850) check for the processing fee.
3- Walden University IRB's conditional approval of the dissertation and the data security plan.

Appendix D: List of Question In Wave II In-Home Questionnaire

In Home Questionnaire Code Book II
Questions and Variable Names

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Question Variable Name

Section A: Setup of CAPI Interview

Respondent identifier number. . . . .**AID**
Month interview completed. **IMONTH2**
Day interview completed. **IDAY2**
Year interview completed. **IYEAR2**
Preloaded variable—school which the respondent attended during the 1994-1995 school year. . . .**SCID2**
Preloaded school in two-school communities. **SSCID2**
Community identifier number. **COMMID2**
Machine number on which the adolescent interview was recorded. **MACNO2**
Interviewer identification number **INTID2**
Interviewer: Is the (1995-1996) school year currently in session for this . . . . **SCH_YR2**
R's school?
Interviewer, please confirm that R's sex is (male) female. (Ask if necessary.) . . . . **BIO_SEX2**
Incorrect biological sex for skips **SEXFLG2**
Version number of the instrument administered **VERSION2**
Calculated age **CALCAGE2**
Incorrect calculated age **AGEFLG2**
Core sample weight without post-stratification adjustment . . . . **CORE1_2**
Core sample weight with post-stratification adjustment . . . . **CORE2_2**
High education black sample weight **HIEDBLK2**
Core sample flag . . . . **SMP01_2**
Disabled sample flag . . . . **SMP02_2**
High education black sample flag . . . . **SMP03_2**
Cuban sample flag . . . . **SMP04_2**
Puerto Rican sample flag . . . . **SMP05_2**
Chinese sample flag . . . . **SMP06_2**
Twin sample flag . . . . **SMP07_2**
Full sibling sample flag . . . . **SMP08_2**
Half sibling sample flag . . . .**SMP09_2**
Non-related adolescent sample flag . . . . **SMP10_2**
PAIR school sample flag . . . . **SMP11_2**

Section 1: General Introductory

1. What is your birth date? month [and year]? **H2GI1M**
What is your birth date? [month and] year? **H2GI1Y**
2. What language is usually spoken in your home? **H2GI2**
3. Since {MOLI}, did you get married? **H2GI3**
4. In what month and year did you get married? **H2GI4M**
In what month an year did you get married? **H2GI4Y**
5. What is your current marital status? **H2GI5**
6. *[If SCHOOL YEAR:]* Are you presently in school? **H2GI6**
[If SUMMER:] Were you in school during this past school year?
7. {ARE/WERE} you attending {SAMPLE SCHOOL}? **H2GI7**

Question	Variable Name
8. {ARE/WERE} you attending {SISTER SCHOOL}?	**H2GI8**
9. *[If SCHOOL YEAR:]* What grade are you in? . . . . *[If SUMMER:]* What grade were you in this past school year?	**H2GI9**
10. Why {AREN'T/WEREN'T} you going to school . . . . Why did you stop going to school during the school year?	**H2GI10**
11. In what month [and year] did you last attend school?	**H2GI11M**
In what [month and] year did you last attend school?	**H2GI11Y**
12. Do you intend to return to school to complete high school?	**H2GI12**
13. In what month [and year] do you intend to return to school?	**H2GI13M**
In what [month and] year do you intend to return to school?	**H2GI13Y**
14. {ARE YOU ENROLLED/WILL YOU ENROLL} in any of these types of programs?	
evening classes	**H2GI14A**
continuation classes	**H2GI14B**
technical training program	**H2GI14C**
junior college or community college classes	**H2GI14D**
apprentice program	**H2GI14E**
job training program	**H2GI14F**
GED classes	**H2GI14G**
{NOT ENROLLED/PLANNING TO ENROLL} in a training program	**H2GI14H**
15. *[If SCHOOL YEAR:]* Did you attend {SAMPLE SCHOOL} during the . . . . 1994-95 school year, in other words, last school year? *[If SUMMER:]* Did you attend {SAMPLE SCHOOL} during the 1994-95 school year, in other words, the school year before this past one?	**H2GI15**
16. *[If SCHOOL YEAR:]* Did you attend {SISTER SCHOOL} the 1994-95 . . . . school year, in other words, last school year? *[If SUMMER:]* Did you attend {SISTER SCHOOL} the 1994-95 school year, in other words, the school year before this past one ?	**H2GI16**
Section 2: Daily Activities	
1. During the past week, how many times did you do work around the house, ... such as cleaning, cooking, laundry, yardwork, or caring for a pet?	**H2DA1**
2. During the past week, how many times did you do hobbies, such as collecting . . . . baseball cards, playing a musical instrument, reading, or doing arts and crafts?	**H2DA2**
3. During the past week, how many times did you watch television or videos, ... or play video games?	**H2DA3**
4. During the past week, how many times did you go roller-blading, roller- . . . . skating, skate-boarding, or bicycling?	**H2DA4**
5. During the past week, how many times did you play an active sport, such as . . . . baseball, softball, basketball, soccer, swimming, or football?	**H2DA5**
6. During the past week, how many times did you do exercise, such as jogging, ... walking, karate, jumping rope, gymnastics or dancing?	**H2DA6**
7. During the past week, how many times did you just hang out with friends?	**H2DA7**
8. How many hours a week do you watch television?	**H2DA8**

Question	Variable Name
9. How many hours a week do you watch videos?	**H2DA9**
10. How many hours a week do you play video or computer games?	**H2DA10**
11. How many hours a week do you listen to the radio?	**H2DA11**

Section 3: General Health

Question	Variable Name
1. In general, how is your health? Would you say...	**H2GH1**
Because of a physical, learning, or emotional condition you have had for at least a year...	
2. do you have any limitations attending school or in your ability to do regular work?	**H2GH2**
3. do you have difficulty in doing regular household chores, shopping, or errands?	**H2GH3**
4. do you have limitations in doing strenuous activities such as running, swimming, or other sports?	**H2GH4**
5. do you have difficulty with personal care or hygiene, namely bathing, dressing, eating, or using the toilet?	**H2GH5**
6. Is your condition physical, learning, or emotional in nature?	
physical	**H2GH6A**
learning	**H2GH6B**
emotional	**H2GH6C**
7. Has the difficulty with your hands, arms, legs, or feet because of a physical condition gotten better, worse, or stayed the same since {MOLI}?	**H2GH7**
Please tell me how often you have had each of the following conditions in the past 12 months. How often have you...	
8. had a headache?	**H2GH8**
9. felt hot all over suddenly, for no reason?	**H2GH9**
10. had a stomach ache or an upset stomach?	**H2GH10**
11. had cold sweats?	**H2GH11**
12. felt physically weak, for no reason?	**H2GH12**
13. had a sore throat or cough?	**H2GH13**
14. felt very tired, for no reason?	**H2GH14**
15. had painful or very frequent urination (or peeing)?	**H2GH15**
16. felt really sick?	**H2GH16**
17. woken up feeling tired?	**H2GH17**
18. had skin problems, such as itching or pimples?	**H2GH18**
19. been dizzy?	**H2GH19**
20. had chest pains?	**H2GH20**
21. had aches, pains, or soreness in your muscles or joints?	**H2GH21**
22. had a poor appetite?	**H2GH22**
23. had trouble falling asleep or staying asleep?	**H2GH23**
24. had trouble relaxing?	**H2GH24**
25. been moody?	**H2GH25**
26. cried frequently?	**H2GH26**
27. been afraid?	**H2GH27**
28. Has there been any time over the past year when you thought you should get medical care, but you did not?	**H2GH28**

Question	Variable Name
29. What kept you from seeing a health professional when you really needed to?	
didn't know whom to go see	**H2GH29A**
had no transportation	**H2GH29B**
no one available to go along	**H2GH29C**
parent or guardian would not go	**H2GH29D**
didn't want parents to know	**H2GH29E**
difficult to make appointment	**H2GH29F**
afraid of what the doctor would say or do	**H2GH29G**
thought the problem would go away	**H2GH29H**
couldn't pay	**H2GH29I**
other	**H2GH29J**
30. How do you think of yourself in terms of weight?	**H2GH30**
31. Are you trying to lose weight, gain weight, or stay the same weight?	**H2GH31**
32. During the past seven days, which of the following things did you do in order to lose weight or to keep from gaining weight?	
dieted	**H2GH32A**
exercised	**H2GH32B**
made yourself vomit	**H2GH32C**
took diet pills	**H2GH32D**
took laxatives	**H2GH32E**
other	**H2GH32F**
none	**H2GH32G**
33. During the past seven days, which of the following things did you do in order to gain weight or to build muscle?	
dieted	**H2GH33A**
exercised	**H2GH33B**
lifted weights	**H2GH33C**
took food supplements	**H2GH33D**
other	**H2GH33F**
none	**H2GH33G**
If SCHOOL NOW, ask Q.34-35.	
34. In an average week, on how many days do you go to physical education classes at school?	**H2GH34**
35. During an average physical education class at school, how many minutes do you spend actually exercising or playing sports?	**H2GH35**
36. How often do you wear a helmet when you ride a bicycle?	**H2GH36**
37. During the past 12 months, how often did you ride a motorcycle?	**H2GH37**
38. When you rode a motorcycle during the past 12 months, how often did you wear a helmet?	**H2GH38**
39. How often do you wear a seatbelt when you are riding in or driving a car?	**H2GH39**
40. In the last month, how often did a health or emotional problem cause you to miss a day of school?	**H2GH40**

Question Variable Name

41. In the last month, how often did a health or emotional problem cause you **H2GH41**
to miss a social or recreational activity?
42. During the school year, what time do you usually go to bed on week nights? **H2GH42**
43. During the summer, what time do you usually go to bed on week nights? **H2GH43**
44. How many hours of sleep do you usually get? **H2GH44**
45. Do you usually get enough sleep? **H2GH45**
46. During the past 12 months, have you ever spent the night away from home **H2GH46**
without permission?
47. Which of these best describes your worst injury during the past year? **H2GH47**
48. Do you have a permanent tattoo? **H2GH48**
49. Do you have one or both ears pierced? **H2GH49**
50. Besides one or both ears, have you had any other body parts pierced? **H2GH50**
51. Do you wear braces on your teeth? **H2GH51**
52. What is your height in feet [and inches]? **H2GH52F**
What is your height in [feet and] inches? **H2GH52I**
53. What is your weight? **H2GH53**

Section 4: Nutrition

Think about everything you had to eat and drink yesterday. This includes snacks as well as your regular

meals.

1. Did you drink milk, including milk poured on cereal or dessert? **H2NU1**
2. Was the milk **H2NU2**
3. Did you drink soft drinks or mixers, such as tonic water or club soda, etc.? **H2NU3**
4. Were the drinks **H2NU4**
5. Did you drink 100% orange, grapefruit, or tomato juice? **H2NU5**
6. Did you drink other 100% fruit juice, not including fruit-flavored drinks? **H2NU6**
7. Did you drink Koolaid, fruit-flavored drinks, Gatoraid, or other sport drinks? **H2NU7**
8. Were the drinks **H2NU8**
9. Did you drink water? **H2NU9**

Now we’re going to talk about the things you ate yesterday. Yesterday, did you eat...

10. apples, applesauce, pears, or pineapple? **H2NU10**
11. bananas, plantains, grapes, berries, or cherries? **H2NU11**
12. cantaloupes, melons, mangoes, or papayas? **H2NU12**
13. oranges, grapefruit, tangerines, or kiwis? **H2NU13**
14. peaches, plums, nectarines, or apricots? **H2NU14**
15. raisins or dried fruit? **H2NU15**
16. mixed vegetables, or acorn, hubbard, or winter squash? **H2NU16**
17. avocados? **H2NU17**
18. string beans, green beans, peas, or snow peas? **H2NU18**
19. cabbage or bok choy? **H2NU19**
20. broccoli? **H2NU20**
21. carrots? **H2NU21**

Question	Variable Name
22. dried beans, peas, lentils, black beans, or soybeans?	**H2NU22**
23. field peas, chick peas, or lima beans?	**H2NU23**
24. kale, beet greens, mustard greens, turnip greens, or collard greens?	**H2NU24**
25. lettuce or tossed salad?	**H2NU25**
26. spinach?	**H2NU26**
27. tomatoes?	**H2NU27**
28. tofu?	**H2NU28**
29. yams or sweet potatoes?	**H2NU29**
30. zucchini, summer squash, eggplants, bell peppers, or asparagus?	**H2NU30**
31. breakfast cereal?	**H2NU31**
32. breakfast bars or breakfast tarts?	**H2NU32**
33. Were they	**H2NU33**
34. Did you eat doughnuts, sweet rolls, muffins, or pastries?	**H2NU34**
35. Were they	**H2NU35**
36. Did you eat hot dogs or frankfurters?	**H2NU36**
37. Were they	**H2NU37**
38. Did you eat ground meat or hamburger?	**H2NU38**
39. Was it	**H2NU39**
40. roast beef, steak, pork, or lamb?	**H2NU40**
41. pizza?	**H2NU41**
42. Was it	**H2NU42**
43. Did you eat chicken or turkey?	**H2NU43**
44. Was it fried?	**H2NU44**
45. Did you eat canned tuna fish?	**H2NU45**
46. Was it	**H2NU46**
47. how was it prepared?	**H2NU47**
48. Did you eat other fish or seafood?	**H2NU48**
49. Was it fried?	**H2NU49**
50. cold cuts, luncheon meats, or ham?	**H2NU50**
51. bacon, sausage, or chorizo?	**H2NU51**
52. eggs?	**H2NU52**
53. yogurt or cottage cheese?	**H2NU53**
54. Was it	**H2NU54**
55. Yesterday, did you eat cheese, processed cheese, or cheese spreads?	**H2NU55**
56. Was it	**H2NU56**
57. bread, rolls, bagels, tortillas, crackers, or English muffins?	**H2NU57**
58. spaghetti, pasta, or noodles?	**H2NU58**
59. rice?	**H2NU59**
60. french fries?	**H2NU60**
61. other potatoes?	**H2NU61**
62. potato chips, corn chips, tortilla chips, pretzels, or popcorn?	**H2NU62**
63. cookies, brownies, cake, or pie?	**H2NU63**
64. Were they	**H2NU64**

Question	Variable Name
65. peanut butter, peanuts, or other nuts?	**H2NU65**
66. ice cream?	**N2NU66**
67. Was it	**H2NU67**
68. Yesterday, did you eat frozen yogurt?	**H2NU68**
69. Was it	**H2NU69**
70. Yesterday, did you eat chocolate bars or candy?	**H2NU70**
With anything you ate, including sandwiches, did you use...	
71. butter or margarine?	**H2NU71**
72. Was it	**H2NU72**
73. salad dressing?	**H2NU73**
74. Was it	**H2NU74**
75. With anything you ate, including sandwiches, did you use mayonnaise or sandwich spread?	**H2NU75**
76. Was it	**H2NU76**
In the last seven days, on how many days did you eat...	
77. at a fast food type place- McDonalds, Kentucky Fried Chicken, Pizza Hut, Taco Bell, etc.?	**H2NU77**
78. breakfast?	**H2NU78**
79. lunch?	**H2NU79**
80. dinner/supper?	**H2NU80**
81. Do you currently take vitamins or minerals?	**H2NU81**
82. In the last seven days, on how many days did you take vitamins or minerals?	**H2NU82**

Section 5: Sun Exposure

When you go outside on a sunny day for more than one hour, how likely are you to...	
1. wear a wide-brimmed hat or a long-sleeved shirt that protects you from the sun?	**H2UV1**
2. stay in the shade to avoid the sun?	**H2UV2**
3. use sunscreen or sunblock?	**H2UV3**
4. After several months of not being in the sun, when you go out in the sun without sunscreen or protective clothing for the first time for at least an hour, do you...	**H2UV4**
5. When you go out in the sun every day for two weeks, do you get...	**H2UV5**
6. How many times in your life have you had a sunburn that blistered?	**H2UV6**
7. How many times during the PAST YEAR have you had a sunburn that blistered?	**H2UV7**
8. How many times in your life have you used a sunlamp or a tanning booth or a tanning parlor or salon?	**H2UV8**
9. During the summer, how often do you sunbathe, or lie in the sun, to get a tan?	**H2UV9**
10. During a typical summer week, how many hours do you spend outdoors in the sun during the day?	**H2UV10**

Section 6: Academics and Education

[If SCHOOL YEAR:] During this school year...	
[If SUMMER:] During the 1995-1996 school year...	
1. how many times {HAVE YOU BEEN/WERE YOU} absent from school for a full	**H2ED1**

day with an excuse—for example, because you were sick or out of town?
2. how many times {HAVE YOU SKIPPED/DID YOU SKIP} school for a full day **H2ED2**
without an excuse?
3. {HAVE YOU RECEIVED/DID YOU RECEIVE} an out-of-school suspension? **H2ED3**
from school?
5. {HAVE YOU BEEN/WERE YOU} expelled from school? **H2ED5**
At the {MOST RECENT GRADING PERIOD/LAST GRADING PERIOD IN
THE SPRING},
7. what was your grade in English or language arts? **H2ED7**
8. what was your grade in mathematics? **H2ED8**
9. what was your grade in history or social studies? **H2ED9**
10. and what was your grade in science? **H2ED10**
[If SCHOOL YEAR:] Since school started this year, how often have you had trouble:
If SUMMER:] During the 1995-1996 school year, how often did you have trouble:
11. getting along with your teachers? **H2ED11**
12. paying attention in school? **H2ED12**
13. getting your homework done? **H2ED13**
14. getting along with other students? **H2ED14**
15. *[If SCHOOL YEAR:]* You feel close to people at your school. **H2ED15**
[If SUMMER:] Last year, you felt close to people at your school.
16. *[If SCHOOL YEAR:]* You feel like you are part of your school. **H2ED16**
[If SUMMER:] Last year, you felt like you were part of your school.
17. *[If SCHOOL YEAR:]* Students at your school are prejudiced. **H2ED17**
[If SUMMER:] Last year, the students at your school were prejudiced.
18. *[If SCHOOL YEAR:]* You are happy to be at your school. **H2ED18**
[If SUMMER:] Last year, you were happy to be at your school.
19. *[If SCHOOL YEAR:]* The teachers at your school treat students fairly. **H2ED19**
[If SUMMER:] Last year, the teachers at your school treated students fairly.
20. *[If SCHOOL YEAR:]* You feel safe in your school. **H2ED20**
[If SUMMER:] Last year, you felt safe in your school.

Section 7: Access to Health Services
1. In the past year have you had a routine physical examination? **H2HS1**
2. Where did you have this examination?
private doctor's office **H2HS2A**
community health clinic **H2HS2B**
school **H2HS2C**
hospital **H2HS2D**
or some other place **H2HS2E**
3. In the past year, have you had a dental examination by a dentist or hygienist? **H2HS3**
4. Where did you have this examination?
private doctor's office **H2HS4A**
community health clinic **H2HS4B**

Question	Variable Name
school	**H2HS4C**
hospital	**H2HS4D**
some other place	**H2HS4E**
5. In the past year, have you received psychological or emotional counseling?	**H2HS5**
6. Where did you receive this counseling?	
private doctor's office	**H2HS6A**
community health clinic	**H2HS6B**
school	**H2HS6C**
hospital	**H2HS6D**
or some other place	**H2HS6E**
7. In the past year, have you attended a drug abuse or alcohol abuse treatment program?	**H2HS7**
8. Where did you receive this treatment?	
private doctor's office	**H2HS8A**
community health clinic	**H2HS8B**
school	**H2HS8C**
hospital	**H2HS8D**
or some other place	**H2HS8E**
9. In the past year, have you received family planning counseling or services?	**H2HS9**
10. Where did you receive family planning counseling or services?	
private doctor's office	**H2HS10A**
community health clinic	**H2HS10B**
school	**H2HS10C**
hospital	**H2HS10D**
or some other place	**H2HS10E**
11. In the past year, have you received testing or treatment for a sexually transmitted disease or AIDS?	**H2HS11**
12. Where did you receive this testing or treatment?	
private doctor's office	**H2HS12A**
community health clinic	**H2HS12B**
school	**H2HS12C**
hospital	**H2HS12D**
or some other place	**H2HS12E**
If R is female, ask Q.13-14.	
13. In the past year, have you received prenatal or post partum health care?	**H2HS13**
14. Where did you receive this care?	
private doctor's office	**H2HS14A**
community health clinic	**H2HS14B**
school	**H2HS14C**
hospital	**H2HS14D**
or some other place	**H2HS14E**

Question | Variable Name

Section 8: Pregnancy, AIDS, and STD Risk Perceptions

1. What do you think your chances are of getting AIDS? **H2RP1**
2. How many people do you know who have AIDS? Include people who are deceased. **H2RP2**
3. What do you think your chances are of getting another sexually transmitted disease, such as gonorrhea or genital herpes? **H2RP3**
4. How many people do you know who have had another sexually transmitted disease, such as gonorrhea or genital herpes? **H2RP4**
5. *[If R is male:]* Getting someone pregnant at this time in your life is one of the worst things that could happen to you. *[If R is female:]* Getting pregnant at this time in your life is one of the worst things that could happen to you. **H2RP5**
6. *[If R is male:]* It wouldn't be all that bad if you got someone pregnant at this time in your life. *[If R is female:]* It wouldn't be all that bad if you got pregnant at this time in your life. **H2RP6**
7. If you got the AIDS virus, you would suffer a great deal. **H2RP7**
8. It would be a big hassle to do the things necessary to completely protect yourself from getting a sexually transmitted disease. **H2RP8**
9. Imagine that sometime soon you were to have sexual intercourse with someone just once, but were unable to use any method of birth control for some reason. *[If R is male:]* What is the chance that you would get your partner pregnant? *[If R is female:]* What is the chance that you would get pregnant? **H2RP9**
10. Suppose that sometime soon you had sexual intercourse for a whole month, as often as you wanted to, without using any protection. What is the chance that you would get the AIDS virus? **H2RP10**

Section 9: Self Efficacy

1. If you wanted to use birth control, how sure are you that you could stop yourself and use birth control once you were highly aroused or turned on? **H2SE1**
2. How sure are you that you could plan ahead to have some form of birth control available? **H2SE2**
3. How sure are you that you could resist sexual intercourse if your partner did not want to use some form of birth control? **H2SE3**
4. Compared with other people your age, how intelligent are you? **H2SE4**

Section 10: Feelings Scale

How often was each of the following true during the past seven days?

1. You were bothered by things that usually don't bother you. **H2FS1**
2. You didn't feel like eating, your appetite was poor. **H2FS2**
3. You felt that you could not shake off the blues, even with help from your family and your friends. **H2FS3**
4. You felt that you were just as good as other people. **H2FS4**
5. You had trouble keeping your mind on what you were doing. **H2FS5**
6. You felt depressed. **H2FS6**

Question Variable Name

7. You felt that you were too tired to do things. **H2FS7**
8. You felt hopeful about the future. **H2FS8**
9. You thought your life had been a failure. **H2FS9**
10. You felt fearful. **H2FS10**
11. You were happy **H2FS11**
12. You talked less than usual. **H2FS12**
13. You felt lonely. **H2FS13**
14. People were unfriendly to you. **H2FS14**
15. You enjoyed life. **H2FS15**
16. You felt sad. **H2FS16**
17. You felt that people disliked you. **H2FS17**
18. It was hard to get started doing things. **H2FS18**
19. You felt life was not worth living. **H2FS19**

Section 11: Household Roster

1. The following questions are about the people with whom you live. **H2HR1**
Please tell me the first names of all the people, other than yourself, who live in your household.
2. {NAME} *1st response*. **H2HR2A**
Is there anyone else? *2nd response* **H2HR2B**
Is there anyone else? *3rd response*. **H2HR2C**
Is there anyone else? *4th response* **H2HR2D**
Is there anyone else? *5th response* **H2HR2E**
Is there anyone else? *6th response* **H2HR2F**
Is there anyone else? *7th response* **H2HR2G**
Is there anyone else? *8th response* **H2HR2H**
Is there anyone else? *9th response* **H2HR2I**
Is there anyone else? *10th response* **H2HR2J**
Is there anyone else? *11th response* **H2HR2K**
Is there anyone else? *12th response* **H2HR2L**
Is there anyone else? *13th response* **H2HR2M**
Is there anyone else? *14th response* **H2HR2N**
Is there anyone else? *15th response* **H2HR2O**
Is there anyone else? *16th response* **H2HR2P**
Is there anyone else? *17th response* **H2HR2Q**

First Household Member

3. Is {NAME} male or female? **H2HR3A**
4. What is {NAME}'s relationship to you? **H2HR4A**
If REL = "son" or "daughter," ask Q.5.
5. Which description best fits {NAME}'s relationship to you? **H2HR5A**
If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.
6. Which description best fits {NAME}'s relationship to you? **H2HR6A**

Question Variable Name

If REL = "father" or "mother's husband," or "mother" or "father's wife," ask Q.7.
7. Which description best fits {NAME}'s relationship to you? **H2HR7A**
8. How old is {NAME}? **H2HR8A**
9. About how old is {NAME}? **H2HR9A**

Second Household Member
3. Is {NAME} male or female? **H2HR3B**
4. What is {NAME}'s relationship to you? **H2HR4B**
If REL ="son" or "daughter," ask Q.5.
5. Which description best fits {NAME}'s relationship to you? **H2HR5B**
If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.
6. Which description best fits {NAME}'s relationship to you? **H2HR6B**
If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7
7. Which description best fits {NAME}'s relationship to you? **H2HR7B**
8. How old is {NAME}? **H2HR8B**
9. About how old is {NAME}? **H2HR9B**

Third Household Member
3. Is {NAME} male or female? **H2HR3C**
4. What is {NAME}'s relationship to you? **H2HR4C**
If REL ="son" or "daughter," ask Q.5.
5. Which description best fits {NAME}'s relationship to you? **H2HR5C**
If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.
6. Which description best fits {NAME}'s relationship to you? **H2HR6C**
If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7
7. Which description best fits {NAME}'s relationship to you? **H2HR7C**
8. How old is {NAME}? **H2HR8C**
9. About how old is {NAME}? **H2HR9C**

Fourth Household Member
3. Is {NAME} male or female? **H2HR3D**
4. What is {NAME}'s relationship to you? **H2HR4D**
If REL ="son" or "daughter," ask Q.5.
5. Which description best fits {NAME}'s relationship to you? **H2HR5D**
If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.
6. Which description best fits {NAME}'s relationship to you? **H2HR6D**
If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7
7. Which description best fits {NAME}'s relationship to you? **H2HR7D**
8. How old is {NAME}? **H2HR8D**
9. About how old is {NAME}? **H2HR9D**

Fifth Household Member
3. Is {NAME} male or female? **H2HR3E**
4. What is {NAME}'s relationship to you? **H2HR4E**

Question Variable Name

If REL =“son” or “daughter,” ask Q.5.
5. Which description best fits {NAME}’s relationship to you? **H2HR5E**
If REL = “brother” or “sister,” “other relative,” or “other non-relative,” ask Q.6.
6. Which description best fits {NAME}’s relationship to you? **H2HR6E**
If REL =“father” or “mother’s husband,” or “mother” or “father’s wife,” ask Q.7
7. Which description best fits {NAME}’s relationship to you? **H2HR7E**
8. How old is {NAME}? **H2HR8E**
9. About how old is {NAME}? **H2HR9E**

Sixth Household Member
3. Is {NAME} male or female? **H2HR3F**
4. What is {NAME}’s relationship to you? **H2HR4F**
If REL =“son” or “daughter,” ask Q.5.
5. Which description best fits {NAME}’s relationship to you? **H2HR5F**
If REL = “brother” or “sister,” “other relative,” or “other non-relative,” ask Q.6.
6. Which description best fits {NAME}’s relationship to you? **H2HR6F**
If REL =“father” or “mother’s husband,” or “mother” or “father’s wife,” ask Q.7
7. Which description best fits {NAME}’s relationship to you? **H2HR7F**
8. How old is {NAME}? **H2HR8F**
9. About how old is {NAME}? **H2HR9F**

Seventh Household Member
3. Is {NAME} male or female? **H2HR3G**
4. What is {NAME}’s relationship to you? **H2HR4G**
If REL =“son” or “daughter,” ask Q.5.
5. Which description best fits {NAME}’s relationship to you? **H2HR5G**
If REL = “brother” or “sister,” “other relative,” or “other non-relative,” ask Q.6.
6. Which description best fits {NAME}’s relationship to you? **H2HR6G**
If REL =“father” or “mother’s husband,” or “mother” or “father’s wife,” ask Q.7
7. Which description best fits {NAME}’s relationship to you? **H2HR7G**
8. How old is {NAME}? **H2HR8G**
9. About how old is {NAME}? **H2HR9G**

Eighth Household Member
3. Is {NAME} male or female? **H2HR3H**
4. What is {NAME}’s relationship to you? **H2HR4H**
If REL = “son” or “daughter,” ask Q.5.
5. Which description best fits {NAME}’s relationship to you? **H2HR5H**
If REL = “brother” or “sister,” “other relative,” or “other non-relative,” ask Q.6.
6. Which description best fits {NAME}’s relationship to you? **H2HR6H**
If REL =“father” or “mother’s husband,” or “mother” or “father’s wife,” ask Q.7
7. Which description best fits {NAME}’s relationship to you? **H2HR7H**
8. How old is {NAME}? **H2HR8H**

Question — Variable Name

9. About how old is {NAME}? **H2HR9H**

Ninth Household Member

3. Is {NAME} male or female? **H2HR3I**
4. What is {NAME}'s relationship to you? **H2HR4I**

If REL = "son" or "daughter," ask Q.5. . . . . **H2HR5I**

5. Which description best fits {NAME}'s relationship to you? **H2HR5I**

If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.

6. Which description best fits {NAME}'s relationship to you? **H2HR6I**

If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7

7. Which description best fits {NAME}'s relationship to you? **H2HR7I**
8. How old is {NAME}? **H2HR8I**
9. About how old is {NAME}? **H2HR9I**

Tenth Household Member

3. Is {NAME} male or female? **H2HR3J**
4. What is {NAME}'s relationship to you? **H2HR4J**

If REL = "son" or "daughter," ask Q.5.

5. Which description best fits {NAME}'s relationship to you? **H2HR5J**

If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.

6. Which description best fits {NAME}'s relationship to you? **H2HR6J**

If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7

7. Which description best fits {NAME}'s relationship to you? **H2HR7J**
8. How old is {NAME}? **H2HR8J**
9. About how old is {NAME}? **H2HR9J**

Eleventh Household Member

3. Is {NAME} male or female? **H2HR3K**
4. What is {NAME}'s relationship to you? **H2HR4K**

If REL = "son" or "daughter," ask Q.5.

5 . Which description best fits {NAME}'s relationship to you? **H2HR5K**

If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.

6. Which description best fits {NAME}'s relationship to you **H2HR6K**

If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7.

7. Which description best fits {NAME}'s relationship to you? **H2HR7K**
8. How old is {NAME}? **H2HR8K**
9. About how old is {NAME}? **H2HR9K**

Twelfth Household Member

3. Is {NAME} male or female? **H2HR3L**
4. What is {NAME}'s relationship to you? **H2HR4L**

If REL = "son" or "daughter," ask Q.5.

5. Which description best fits {NAME}'s relationship to you? **H2HR5L**

If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.

Question Variable Name

6. Which description best fits {NAME}'s relationship to you? **H2HR6L**
If REL =“father” or “mother's husband,” or “mother” or “father's wife,” ask Q.7
7. Which description best fits {NAME}'s relationship to you? **H2HR7L**
8. How old is {NAME}? **H2HR8L**
9. About how old is {NAME}? **H2HR9L**

Thirteenth Household Member

3. Is {NAME} male or female? **H2HR3M**
4. What is {NAME}'s relationship to you? **H2HR4M**
If REL = “son” or “daughter,” ask Q.5.
5. Which description best fits {NAME}'s relationship to you? **H2HR5M**
If REL = “brother” or “sister,” “other relative,” or “other non-relative,” ask Q.6.
6. Which description best fits {NAME}'s relationship to you? **H2HR6M**
If REL =“father” or “mother's husband,” or “mother” or “father's wife,” ask Q.7.
7. Which description best fits {NAME}'s relationship to you? **H2HR7M**
8 . How old is {NAME}? **H2HR8M**
9. About how old is {NAME}? **H2HR9M**

Fourteenth Household Member

3. Is {NAME} male or female? **H2HR3N**
4. What is {NAME}'s relationship to you? **H2HR4N**
If REL = “son” or “daughter,” ask Q.5.
5. Which description best fits {NAME}'s relationship to you? **H2HR5N**
If REL = “brother” or “sister,” “other relative,” or “other non-relative,” ask Q.6.
6. Which description best fits {NAME}'s relationship to you? **H2HR6N**
If REL =“father” or “mother's husband,” or “mother” or “father's wife,” ask Q.7.
7. Which description best fits {NAME}'s relationship to you? **H2HR7N**
8 . How old is {NAME}? **H2HR8N**
9. About how old is {NAME}? **H2HR9N**

Fifteenth Household Member

3. Is {NAME} male or female? **H2HR3O**
4. What is {NAME}'s relationship to you? **H2HR4O**
If REL = “son” or “daughter,” ask Q.5.
5. Which description best fits {NAME}'s relationship to you? **H2HR5O**
If REL = “brother” or “sister,” “other relative,” or “other non-relative,” ask Q.6.
6. Which description best fits {NAME}'s relationship to you? **H2HR6O**
If REL =“father” or “mother's husband,” or “mother” or “father's wife,” ask Q.7
7. Which description best fits {NAME}'s relationship to you? **H2HR7O**
8. How old is {NAME}? **H2HR8O**
9. About how old is {NAME}? **H2HR9O**

Question Variable Name

Sixteenth Household Member

3. Is {NAME} male or female? **H2HR3P**
4. What is {NAME}'s relationship to you? **H2HR4P**

If REL = "son" or "daughter," ask Q.5.

5. Which description best fits {NAME}'s relationship to you? **H2HR5P**

If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.

6. Which description best fits {NAME}'s relationship to you? **H2HR6P**

If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7

7. Which description best fits {NAME}'s relationship to you? **H2HR7P**
8. How old is {NAME}? **H2HR8P**
9. About how old is {NAME}? **H2HR9P**

Seventeenth Household Member

3. Is {NAME} male or female? **H2HR3Q**
4. What is {NAME}'s relationship to you? **H2HR4Q**

If REL = "son" or "daughter," ask Q.5.

5. Which description best fits {NAME}'s relationship to you? **H2HR5Q**

If REL = "brother" or "sister," "other relative," or "other non-relative," ask Q.6.

6. Which description best fits {NAME}'s relationship to you? **H2HR6Q**

If REL ="father" or "mother's husband," or "mother" or "father's wife," ask Q.7.

7. Which description best fits {NAME}'s relationship to you? **H2HR7Q**
8. How old is {NAME}? **H2HR8Q**
9. About how old is {NAME}? **H2HR9Q**

If Q.7 has never been answered, ask Q.10-11.

10. You have not indicated that any member of your household is either your **H2HR10**
mother or your father. Who in your household acts in place of a mother to you?
11. Who in your household acts in place of a father to you? **H2HR11**

Section 12: Non-Resident Biological Mother

1. Do you know anything about your biological mother—the woman who **H2NM1**
gave birth to you?
2. Have you lived with her since {MOLI}? **H2NM2**
3. In what month [and year] did you last live with her? **H2NM3M**
In what [month and] year did you last live with her? **H2NM3Y**
4. Is she still living? **H2NM4**
5. How old were you when she died? **H2NM5**

If Q.4= "yes," "refused," or "don't know," ask Q9-13.

9. In the last 12 months, about how often have you stayed overnight with her? **H2NM9**
10. In the last 12 months, about how often have you talked to her in person or **H2NM10**
on the telephone, or received a letter from her?
11. Which of the following things have you done with your biological mother
in the past four weeks?
went shopping **H2NM11A**

Question	Variable Name
played a sport	**H2NM11B**
went to a religious service or church-related event	**H2NM11C**
talked about someone you're dating, or a party you went to	**H2NM11D**
went to a movie, play, museum, concert, or sports event	**H2NM11E**
talked about a personal problem you were having	**H2NM11F**
had a serious argument about your behavior	**H2NM11G**
talked about your school work or grades	**H2NM11H**
worked on a project for school	**H2NM11I**
talked about other things you're doing in school	**H2NM11J**
none of the above activities	**H2NM11K**
12. Since {MOLI}, has your biological mother smoked cigarettes?	**H2NM12**
13. How close do you feel to your biological mother?	**H2NM13**

Section 13: Non-Resident Biological Father

1. Do you know anything about your biological father?	**H2NF1**
2. Have you lived with him since {MOLI}?	**H2NF2**
3. In what month [and year] did you last live with him?	**H2NF3M**
In what [month and] year did you last live with him?	**H2NF3Y**
4. Is he still living?	**H2NF4**
5. How old were you when he died?	**H2NF5**
If Q.4 = "yes," "refused," or "don't know," ask Q.9-13.	
9. In the last 12 months, about how often have you stayed overnight with him?	**H2NF9**
10. In the last 12 months, about how often have you talked to him in person or on the telephone, or received a letter from him?	**H2NF10**
11. Which of the following things have you done with your biological father in the past four weeks?	
went shopping	**H2NF11A**
played a sport	**H2NF11B**
went to a religious service or church-related event	**H2NF11C**
talked about someone you're dating, or a party you went to	**H2NF11D**
went to a movie, play, museum, or concert, or sports event	**H2NF11E**
talked about a personal problem you were having	**H2NF11F**
had a serious argument about your behavior	**H2NF11G**
talked about your school work or grades	**H2NF11H**
worked on a project for school	**H2NF11I**
talked about other things you're doing in school	**H2NF11J**
none of the above activities	**H2NF11K**
12. Since {MOLI}, has your biological father smoked cigarettes?	**H2NF12**
13. How close do you feel to your biological father?	**H2NF13**

Section 14: Resident Mother

1. How far in school did she go?	**H2RM1**
2. Was she born in the United States?	**H2RM2**

Question	Variable Name
3. In what country was she born?	**H2RM3**
4. What kind of work does she do?	**H2RM4**
5. Does she work for pay?	**H2RM5**
6. Has she worked for pay at any time in the last 12 months?	**H2RM6**
7. Approximately how many hours a week does she work for pay?	**H2RM7**
8. Does she work at home or outside the home?	**H2RM8**
9. Does she receive public assistance, such as welfare?	**H2RM9**
10. Is she disabled—that is, mentally or physically handicapped?	**H2RM10**
11. How often is she at home when you leave for school?	**H2RM11**
12. How often is she at home when you return from school?	**H2RM12**
13. How often is she at home when you go to bed?	**H2RM13**
14. Since {MOLI}, has she smoked cigarettes?	**H2RM14**
Section 15: Resident Father	
1. How far in school did he go?	**H2RF1**
2. Was he born in the United States?	**H2RF2**
3. In what country was he born?	**H2RF3**
4. What kind of work does he do?	**H2RF4**
5. Does he work for pay?	**H2RF5**
6. Has he worked for pay at any time in the last 12 months?	**H2RF6**
7. Approximately how many hours a week does he work for pay?	**H2RF7**
8. Does he work at home or outside the home?	**H2RF8**
9. Does he receive public assistance, such as welfare?	**H2RF9**
10. Is he disabled—that is, mentally or physically handicapped?	**H2RF10**
11. How often is he at home when you leave for school?	**H2RF11**
12. How often is he at home when you return from school?	**H2RF12**
13. How often is he at home when you go to bed?	**H2RF13**
14. Since {MOLI}, has he smoked cigarettes?	**H2RF14**
Section 16: Relations with Parents	
Do your parents let you make your own decisions about ...	
1. the time you must be home on weekend nights?	**H2WP1**
2. the people you hang around with?	**H2WP2**
3. what you wear?	**H2WP3**
4. how much television you watch?	**H2WP4**
5. which television programs you watch?	**H2WP5**
6. what time you go to bed on week nights?	**H2WP6**
7. what you eat?	**H2WP7**
8. On how many of the past 7 days was at least one of your parents in the room with you while you ate your evening meal?	**H2WP8**
9. How close do you feel to {MOM NAME}?	**H2WP9**
10. How much do you think she cares about you?	**H2WP10**
11. On a scale of 1 to 5, where 1 is low and 5 is high, how disappointed would	**H2WP11**

Question Variable Name

she be if you did not graduate from college?
12. On a scale of 1 to 5, where 1 is low and 5 is high, how disappointed would **H2WP12**
she be if you did not graduate from high school?
13. How close do you feel to {DAD NAME}? **H2WP13**
14. How much do you think he cares about you? **H2WP14**
15. On a scale of 1 to 5, where 1 is low and 5 is high, how disappointed would **H2WP15**
he be if you did not graduate from college?
16. On a scale of 1 to 5, where 1 is low and 5 is high, how disappointed would **H2WP16**
he be if you did not graduate from high school?
17. Which of the things listed on this card have you done with {MOM NAME}
in the past 4 weeks?
went shopping **H2WP17A**
played a sport **H2WP17B**
went to a religious service or church-related event **H2WP17C**
talked about someone you’re dating, or a party you went to **H2WP17D**
went to a movie, play, museum, concert, or sports event **H2WP17E**
had a talk about a personal problem you were having **H2WP17F**
had a serious argument about your behavior **H2WP17G**
talked about your school work or grades **H2WP17H**
worked on a project for school **H2WP17I**
talked about other things you’re doing in school **H2WP17J**
none **H2WP17K**
18. Which of these things have you done with {DAD NAME} in the past 4 weeks?
went shopping **H2WP18A**
played a sport **H2WP18B**
went to a religious service or church-related event **H2WP18C**
talked about someone you’re dating, or a party you went to **H2WP18D**
went to a movie, play, museum, concert, or sports event **H2WP18E**
talked about a personal problem you were having **H2WP18F**
had a serious argument about your behavior **H2WP18G**
talked about your school work or grades **H2WP18H**
worked on a project for school **H2WP18I**
talked about other things you’re doing in school **H2WP18J**
none **H2WP18K**

Section 17: Motivations to Engage in Risky Behaviors

Indicate whether you agree or disagree with the following statements.
1. If you had sexual intercourse, your friends would respect you more. **H2MO1**
2. If you had sexual intercourse, your partner would lose respect for you. **H2MO2**
3. If you had sexual intercourse, afterward, you would feel guilty. **H2MO3**
4. If you had sexual intercourse, it would upset {MOM NAME}. **H2MO4**
5. If you had sexual intercourse, it would give you a great deal of physical pleasure **H2MO5**
6. *If R is male*: If you had sexual intercourse, it would make you more **H2MO6**

Question | Variable Name

attractive to women.
If R is female: If you had sexual intercourse, it would make you more attractive to men.

7. If you had sexual intercourse, you would feel less lonely. **H2MO7**

8. *If R is male*: If you got someone pregnant, it would be embarrassing for . . . .**H2MO8** your family.
If R is female: If you got pregnant, it would be embarrassing for your family.

9. *If R is male*: If you got someone pregnant, it would be embarrassing for you. **H2MO9**
If R is female: If you got pregnant, it would be embarrassing for you.

10. *If R is male*: If you got someone pregnant, you would have to quit school. **H2MO10**
If R is female: If you got pregnant, you would have to quit school.

11. *If R is male*: If you got someone pregnant, you might marry the wrong . . . . **H2MO11** person, just to get married.
If R is female: If you got pregnant, you might marry the wrong person, just to get married.

12. *If R is male*: If you got someone pregnant, you would be forced to grow . . . . **H2MO12** up too fast.
If R is female: If you got pregnant, you would be forced to grow up too fast.

13. *If R is male*: If you got someone pregnant, you would have to help her . . . .**H2MO13** decide whether or not to have the baby, and that would be stressful and difficult.
If R is female: If you got pregnant, you would have to decide whether or not to have the baby, and that would be stressful and difficult.

14. *If R is male:* If you got someone pregnant, you would encourage the girl to . . . . **H2MO14** get an abortion.
If R is female: If you got pregnant, you would consider getting an abortion.

15. You are morally opposed to abortions. **H2MO15**

16. Have you taken a public or written pledge to remain a virgin until marriage? **H2MO16**

Section 18: Personality and Family

If RESMOM, ask Q.1-7.

1.
Most of the time, {MOM NAME} is warm and loving toward you. **H2PF1**

2. {MOM NAME} encourages you to be independent. **H2PF2**

3. When you do something wrong that is important, {MOM NAME} talks about it . . . . **H2PF3** with you and helps you understand why it is wrong.

4. You are satisfied with the way {MOM NAME} and you communicate with . . . . **H2PF4** each other.

5. Overall, you are satisfied with your relationship with {MOM NAME}. **H2PF5**

6. You usually tell {MOM NAME} where you are going after school. **H2PF6**

7. {MOM NAME} usually knows what is going on in your life. **H2PF7**

If RESDAD, ask Q.8-10.

8. Most of the time, {DAD NAME} is warm and loving toward you. **H2PF8**

Question	Variable Name
9. You are satisfied with the way {DAD NAME} and you communicated with each other.	**H2PF9**
10. Overall, you are satisfied with your relationship with {DAD NAME}.	**H2PF10**
11. You usually tell your mother or father where you are going when you go out on weekends or evenings.	**H2PF11**
12. When you get what you want, it's usually because you worked hard for it.	**H2PF12**
13. You usually go out of your way to avoid having to deal with problems in your life.	**H2PF13**
14. Difficult problems make you very upset.	**H2PF14**
15. When making decisions, you usually go with your "gut feeling" without thinking too much about the consequences of each alternative.	**H2PF15**
16. After carrying out a solution to a problem, you usually try to think about what went right and what went wrong.	**H2PF16**
17. You have a lot of energy.	**H2PF17**
18. You seldom get sick.	**H2PF18**
19. When you do get sick, you get better quickly.	**H2PF19**
20. You are well coordinated.	**H2PF20**
21. You have a lot of good qualities.	**H2PF21**
22. You are physically fit.	**H2PF22**
23. You have a lot to be proud of.	**H2PF23**
24. You like yourself just the way you are.	**H2PF24**
25. You feel like you are doing everything just about right.	**H2PF25**
26. You feel socially accepted.	**H2PF26**
27. You feel loved and wanted.	**H2PF27**
28. You like to take risks.	**H2PF28**
29. You are independent.	**H2PF29**
30. You are shy.	**H2PF30**
31. You are assertive.	**H2PF31**
32. You are sensitive to other people's feelings.	**H2PF32**
33. You are emotional.	**H2PF33**
34. You can pretty much determine what will happen in your life.	**H2PF34**
35. You live your life without much thought for the future.	**H2PF35**
36. You are quite knowledgeable about how to use a condom correctly.	**H2PF36**
37. You are quite knowledgeable about the rhythm method of birth control. and when it is a "safe" time during the month for a woman to have sex and not get pregnant.	**H2PF37**
38. You are quite knowledgeable about the withdrawal method of birth control.	**H2PF38**
39. Your closest friends are quite knowledgeable about the withdrawal method of birth control.	**H2PF39**
40. Your closest friends are quite knowledgeable about how to use a condom correctly.	**H2PF40**
41. Your closest friends are quite knowledgeable about the rhythm method of birth control and when it is a "safe" time during the month for a woman to have sex and not get pregnant.	**H2PF41**

Question Variable Name

Section 19: Knowledge Quiz

For each of the following statements, please tell me if think it is true or false.

1a. When a woman has sexual intercourse, almost all sperm die inside her body after about six hours. **H2KQ1A**

1b. How confident are you that your answer is correct? **H2KQ1B**

2a. When using a condom, the man should pull out of the woman right after he has ejaculated (come). **H2KQ2A**

2b. How confident are you that your answer is correct? **H2KQ2B**

3a. Most women's periods are regular, that is, they ovulate (are fertile) fourteen days after their periods begin. **H2KQ3A**

3b. How confident are you that your answer is correct? **H2KQ3B**

4a. Natural skin or lamb skin condoms provide better protection against the AIDS virus than latex condoms. **H2KQ4A**

4b. How confident are you that your answer is correct? **H2KQ4B**

5a. When putting on a condom, it is important to have it fit tightly, leaving no space at the tip. **H2KQ5A**

5b. How confident are you that your answer is correct? **H2KQ5B**

6a. Vaseline can be used with condoms, and they will work just as well. **H2KQ6A**

6b. How confident are you that your answer is correct? **H2KQ6B**

7a. The most likely time for a woman to get pregnant is right before her period starts. **H2KQ7A**

7b. How confident are you that your answer is correct? **H2KQ7B**

8a. Even if the man pulls out before he ejaculates (even if ejaculation occurs outside of the woman's body), it is still possible for the woman to become pregnant. **H2KQ8A**

8b. How confident are you that your answer is correct? **H2KQ8B**

9a. As long as the condom fits over the tip of the penis, it doesn't matter how far down it is unrolled. **H2KQ9A**

9b. How confident are you that your answer is correct? **H2KQ9B**

10a. In general, a woman is most likely to get pregnant if she has sex during her period, as compared with other times of the month. **H2KQ10A**

10b. How confident are you that your answer is correct? **H2KQ10B**

Section 20: Friends

Flag used to determine number of friend nominations. . . . . **FR_FLAG2**

Version A: *[For R's asked to nominate up to 5 male and 5 female friends.]* First, please tell me the names of your 5 best male friends, starting with your best male friend. *(I f R is female, add:* If you have a boyfriend , list him first. If not, begin with your best male friend.)

Version B: *[For R's asked to nominate 1 male and 1 female friend.]* First, please think of your best male friend. *(If R is female, add:* If you have a boyfriend, list him. If not, list your best male friend.)

1. What is his name? **H2MF1**

3. And is there another male friend? **H2MF3A**

And is there another male friend? **H2MF3B**

Question	Variable Name
And is there another male friend?	**H2MF3C**
And is there another male friend?	**H2MF3D**

First or Only Male Friend

4. *[If SCHOOL YEAR:]* Does {NAME} go to school? *[If SUMMER:]* Did {NAME} go to school during this past school year?	**H2MF4A**
5. *[If SCHOOL YEAR:]* What grade is {NAME} in? *[If SUMMER:]* What grade was {NAME} in during this past school year?	**H2MF5A**
6. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? *[If SUMMER:]* Did {NAME} go to {SAMPLE SCHOOL} this past school year?	**H2MF6A**
7. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? *[If SUMMER:]* Did {NAME} go to {SISTER SCHOOL} this past school year?	**H2MF7A**
8. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95 school year? *[If SUMMER:]* Did {NAME} go to {SAMPLE SCHOOL} this past school year?	**H2MF8A**
9. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 school year? *[If SUMMER:]* Did {NAME} go to {SISTER SCHOOL} this past school year?	**H2MF9A**
11. Did you go to {NAME}'s house during the past seven days?	**H2MF11A**
12. Did you meet {NAME} after school to hang out or go somewhere during the past seven days?	**H2MF12A**
13. Did you spend time with {NAME} during the past weekend?	**H2MF13A**
14. Did you talk to {NAME} about a problem during the past seven days?	**H2MF14A**
15. Did you talk to {NAME} on the telephone during the past seven days?	**H2MF15A**

Second Male Friend

4. *[If SCHOOL YEAR:]* Does {NAME} go to school? *[If SUMMER:]* Did {NAME} go to school during this past school year?	**H2MF4B**
5. *[If SCHOOL YEAR:]* What grade is {NAME} in? *[If SUMMER:]* What grade was {NAME} in during this past school year?	**H2MF5B**
6. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? *[If SUMMER:]* Did {NAME} go to {SAMPLE SCHOOL} this past school year?	**H2MF6B**
7. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? *[If SUMMER:]* Did {NAME} go to {SISTER SCHOOL} during this past school year?	**H2MF7B**
8. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95 school year? *[If SUMMER:]* Did {NAME} go to {SAMPLE SCHOOL} this past school year?	**H2MF8B**
9. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 school year?	**H2MF9B**
11. Did you go to {NAME}'s house during the past seven days?	**H2MF11B**
12. Did you meet {NAME} after school to hang out or go somewhere during the past seven days?	**H2MF12B**
13. Did you spend time with {NAME} during the past weekend?	**H2MF13B**

Question | Variable Name

14. Did you talk to {NAME} about a problem during the past seven days? **H2MF14B**
15. Did you talk to {NAME} on the telephone during the past seven days? **H2MF15B**

Third Male Friend

4. *[If SCHOOL YEAR:]* Does {NAME} go to school? **H2MF4C**
[If SUMMER:] Did {NAME} go to school during this past school year?
5. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2MF5C**
[If SUMMER:] What grade was {NAME} in during this past school year?
6. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2MF6C**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
7. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2MF7C**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} during this past school year?
8. *[IF SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95. . . . . . . **H2MF8C**
school year?
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
9. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 . **H2MF9C**
school year?
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
11. Did you go to {NAME}'s house during the past seven days? **H2MF11C**
12. Did you meet {NAME} after school to hang out or go somewhere during the **H2MF12C**
past seven days?
13. Did you spend time with {NAME} during the past weekend? **H2MF13C**
14. Did you talk to {NAME} about a problem during the past seven days? **H2MF14C**
15. Did you talk to {NAME} on the telephone during the past seven days? **H2MF15C**

Fourth Male Friend

4. *[If SCHOOL YEAR:]* Does {NAME} go to school? **H2MF4D**
[If SUMMER:] Did {NAME} go to school during this past school year?
5. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2MF5D**
[If SUMMER:] What grade was {NAME} in during this past school year?
6. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2MF6D**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
7. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2MF7D**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
8. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95 **H2MF8D**
school year?
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
9. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 . **H2MF9D**
school year?
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
11. Did you go to {NAME}'s house during the past seven days? **H2MF11D**
12. Did you meet {NAME} after school to hang out or go somewhere during the **H2MF12D**
past seven days?

Question . . . Variable Name

13. Did you spend time with {NAME} during the past weekend? **H2MF13D**
14. Did you talk to {NAME} about a problem during the past seven days? **H2MF14D**
15. Did you talk to {NAME} on the telephone during the past seven days? **H2MF15D**

Fifth Male Friend

4. *[If SCHOOL YEAR:]* Does {NAME} go to school? **H2MF4E**
[If SUMMER:] Did {NAME} go to school during this past school year?
5. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2MF5E**
[If SUMMER:] What grade was {NAME} in during this past school year?
6. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2MF6E**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL this past school year?
7. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2MF7E**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
8. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95 school year? **H2MF8E**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
9. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 . school year? **H2MF9E**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
11. Did you go to {NAME}'s house during the past seven days? **H2MF11E**
12. Did you meet {NAME} after school to hang out or go somewhere during the . . . . . past seven days? **H2MF12E**
13. Did you spend time with {NAME} during the past weekend? **H2MF13E**
14. Did you talk to {NAME} about a problem during the past seven days? **H2MF14E**
15. Did you talk to {NAME} on the telephone during the past seven days? **H2MF15E**

Version A: Next, please think of your best female friend. *(If R is male, add:* If you have a girlfriend, list her first. If not, begin with your best female friend.)

Version B: Next, please think of your best female friend. *(If R is male, add:* If you have a girlfriend, list her. If not, list your best female friend.)

16. What is her name? **H2FF1**
18. And is there another female friend? **H2FF3A**
18. And is there another female friend? **H2FF3B**
18. And is there another female friend? **H2FF3C**
18. And is there another female friend? **H2FF3D**

First or Only Female Friend

19. *[If SCHOOL YEAR:]* Does {NAME} go to school? **H2FF4A**
[If SUMMER:] Did {NAME} go to school during this past school year?
20. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2FF5A**
[If SUMMER:] What grade was {NAME} in during this past school year?
21. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2FF6A**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
22. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2FF7A**

Question | Variable Name

[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the **H2FF8A**
1994-95 school year?
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the **H2FF9A**
1994-95 school year?
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
26. Did you go to {NAME}'s house during the past seven days? **H2FF11A**
27. Did you meet {NAME} after school to hang out or go somewhere during the **H2FF12A**
past seven days?
28. Did you spend time with {NAME} during the past weekend? **H2FF13A**
29. Did you talk to {NAME} about a problem during the past seven days? **H2FF14A**
30. Did you talk to {NAME} on the telephone during the past seven days? **H2FF15A**

Second Female Friend
19. *[If SCHOOL YEAR:]* Does {NAME} go to school?
[If SUMMER:] Did {NAME} go to school during this past school year? **H2FF4B**
20. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2FF5B**
[If SUMMER:] What grade was {NAME} in during this past school year?
21. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2FF6B**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
22. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2FF7B**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} during this past school year?
23. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95. . . . . . . **H2FF8B**
school year?
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 . . . .**H2FF9B**
school year?
26. Did you go to {NAME}'s house during the past seven days? **H2FF11B**
27. Did you meet {NAME} after school to hang out or go somewhere during the **H2FF12B**
past seven days?
28. Did you spend time with {NAME} during the past weekend? **H2FF13B**
29. Did you talk to {NAME} about a problem during the past seven days? **H2FF14B**
30. Did you talk to {NAME} on the telephone during the past seven days? **H2FF15B**

Third Female Friend
19. *[If SCHOOL YEAR:]* Does {NAME} go to school? **H2FF4C**
[If SUMMER:] Did {NAME} go to school during this past school year?
20. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2FF5C**
[If SUMMER:] What grade was {NAME} in during this past school year?
21. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2FF6C**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
22. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2FF7C**

Question Variable Name

[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} during this past school year?
23. *[IF SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95 . . . **H2FF8C** school year?
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 . . . . . **H2FF9C** school year?
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
26. Did you go to {NAME}'s house during the past seven days? **H2FF11C**
27. Did you meet {NAME} after school to hang out or go somewhere during the . . . . . **H2FF12C** past seven days?
28. Did you spend time with {NAME} during the past weekend? **H2FF13C**
29. Did you talk to {NAME} about a problem during the past seven days? **H2FF14C**
30. Did you talk to {NAME} on the telephone during the past seven days? **H2FF15C**

Fourth Female Friend
19. *[If SCHOOL YEAR:]* Does {NAME} go to school? **H2FF4D**
[If SUMMER:] Did {NAME} go to school during this past school year?
20. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2FF5D**
[If SUMMER:] What grade was {NAME} in during this past school year?
21. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2FF6D**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
22. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2FF7D**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95 . . . . . **H2FF8D** school year?
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 . . . . . . **H2FF9D** school year?
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
26. Did you go to {NAME}'s house during the past seven days? **H2FF11D**
27. Did you meet {NAME} after school to hang out or go somewhere during the . . . . . **H2FF12D** past seven days?
28. Did you spend time with {NAME} during the past weekend? **H2FF13D**
29. Did you talk to {NAME} about a problem during the past seven days? **H2FF14D**
30. Did you talk to {NAME} on the telephone during the past seven days? **H2FF15D**

Fifth Female Friend
19. *[If SCHOOL YEAR:]* Does {NAME} go to school? **H2FF4E**
[If SUMMER:] Did {NAME} go to school during this past school year?
20. *[If SCHOOL YEAR:]* What grade is {NAME} in? **H2FF5E**
[If SUMMER:] What grade was {NAME} in during this past school year?
21. *[If SCHOOL YEAR:]* Does {NAME} go to {SAMPLE SCHOOL}? **H2FF6E**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?

Question Variable Name

22. *[If SCHOOL YEAR:]* Does {NAME} go to {SISTER SCHOOL}? **H2FF7E**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Did {NAME} go to {SAMPLE SCHOOL} during the 1994-95 school year? **H2FF8E**
[If SUMMER:] Did {NAME} go to {SAMPLE SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {NAME} go to {SISTER SCHOOL} during the 1994-95 school year? **H2FF9E**
[If SUMMER:] Did {NAME} go to {SISTER SCHOOL} this past school year?
26. Did you go to {NAME}'s house during the past seven days? **H2FF11E**
27. Did you meet {NAME} after school to hang out or go somewhere during the past seven days? **H2FF12E**
28. Did you spend time with {NAME} during the past weekend? **H2FF13E**
29. Did you talk to {NAME} about a problem during the past seven days? **H2FF14E**
30. Did you talk to {NAME} on the telephone during the past seven days? **H2FF15E**

Section 21: Romantic Relationship Roster

1. How much would you like to have a romantic relationship in the next year? **H2RR1**
2A. In the last 18 months- since {MONTH, YEAR}- have you had a romantic relationship with anyone? **H2RR2A**
2B. Have you had a special romantic relationship in the last 18 months with any other person? **H2RR2B**
2C. Have you had a special romantic relationship in the last 18 months with any other person? **H2RR2C**
2D. Have you had a special romantic relationship in the last 18 months with any other person? **H2RR2D**
4. Did you ever hold hands with {INITIALS}? *1st person*. **H2RR4A**
5. Did you and {INITIALS} ever kiss on the mouth? *1st person* **H2RR5A**
6. Did you ever tell {INITIALS} you liked or loved him or her? *1st person* **H2RR6A**
4. Did you ever hold hands with {INITIALS}? *2nd person*. **H2RR4B**
5. Did you and {INITIALS} ever kiss on the mouth? *2nd person*. **H2RR5B**
6. Did you ever tell {INITIALS} you liked or loved him or her? *2nd person*. **H2RR6B**
4. Did you ever hold hands with {INITIALS}? *3rd person*. **H2RR4C**
5. Did you and {INITIALS} ever kiss on the mouth? *3rd person*. **H2RR5C**
6. Did you ever tell {INITIALS} you liked or loved him or her? *3rd person*. **H2RR6C**

Section 22: Liked Relationship Roster

1. In the last 18 months, did you ever hold hands with someone who was not a member of your family? **H2LR1**
2. In the last 18 months, did you ever kiss someone on the mouth who was not a member of your family? **H2LR2**
3. In the last 18 months, did you ever tell someone who was not a member of your family that you liked or loved them? **H2LR3**
4. Did you do these things with the same person? **H2LR4**

Question | Variable Name

Section 23: Contraception—Audio CASI

1. Have you ever touched another person's genitals, that is, their private **H2CO1**
parts, or has another person ever touched your genitals in a sexual way?
2. Have you ever had sexual intercourse? **H2CO2**
3. In what month [and year] did you have sexual intercourse for the very **H2CO3M**
first time?
In what [month and] year did you have sexual intercourse for the very **H2CO3Y**
first time?
4. Did you or your partner use any method of birth control the first time you **H2CO4**
had sexual intercourse?
5. What method of birth control did you or your partner use the first time you **H2CO5A**
had sexual intercourse?
What other method of birth control did you or your partner use the first time **H2CO5B**
you had sexual intercourse?
What other method of birth control did you or your partner use the first time **H2CO5C**
you had sexual intercourse?
6. In what month [and year] did you have sexual intercourse most recently? **H2CO6M**
In what [month and] year did you have sexual intercourse most recently? **H2CO6Y**
7. Did you or your partner use any method of birth control when you had **H2CO7**
sexual intercourse most recently?
8. What method of birth control did you or your partner use? **H2CO8A**
What other method of birth control did you or your partner use? **H2CO8B**
What other method of birth control did you or your partner use? **H2CO8C**
9. Since {MOLI}, {HAVE YOU/HAS A PARTNER OF YOURS} ever used a **H2CO9**
condom during sexual intercourse?
10. Thinking of all the times you have had sexual intercourse since {MOLI}, ... **H2CO10**
about what proportion of the time {HAVE YOU/HAS A PARTNER OF YOURS}
used a condom?
11. Thinking of all the times you have had sexual intercourse during the past **H2CO11**
12 months, about what proportion of the time have you or a partner of yours
used birth control, that is, some form of pregnancy protection?
12. *If R is male*: Since {MOLI}, did you ever physically force someone to **H2CO12**
have sexual intercourse against her will?
If R is female: Since {MOLI}, were you ever physically forced to have sexual
intercourse against your will?
13. Have you ever had anal intercourse? **H2CO13**
If R is female , ask Q.14-18.
14. Since {MOLI}, have you received a birth **H2CO14**
control method from a doctor or clinic?
15. What method of birth control did you receive? **H2CO15A**
What other method of birth control did you receive? **H2CO15B**
What other method of birth control did you receive? **H2CO15C**
16. Since {MOLI}, have you taken birth control pills regularly for at least one **H2CO16**

Question | Variable Name

monthly cycle?
17. Since {MOLI}, in what month [and year] did you first take birth control **H2CO17M**
pills regularly for at least one monthly cycle?
Since {MOLI}, in what [month and] year did you first take birth control **H2CO17Y**
pills regularly for at least one monthly cycle?
18. Are you currently taking birth control pills regularly? **H2CO18**
19. Since {MOLI}, have you ever been told by a doctor or a nurse that you had...
chlamydia **H2CO19A**
syphilis **H2CO19B**
gonorrhea **H2CO19C**
HIV or AIDS **H2CO19D**
genital herpes **H2CO19E**
genital warts **H2CO19F**
trichomoniasis **H2CO19G**
hepatitis B **H2CO19H**
If R is female, add: bacterial vaginosis **H2CO19I**
If R is female, add: non-gonococcal vaginitis **H2CO19J**

Section 24: Relationship Information—Audio CASI
First Romantic Partner
1. In what month [and year] did your romantic relationship with . . . . **H2RI1M_1**
{INITIALS} begin?
In what [month and] year did your romantic relationship with . . . . **H2RI1Y_1**
{INITIALS} begin?
2. How old was {INITIALS} when your romantic relationship began? . . . . **H2RI2_1**
3. About how old was {INITIALS}? . . . . **H2RI3_1**
4. What grade was {INITIALS} in at that time? . . . . **H2RI4_1**
5. When your relationship with {INITIALS} began, did you and {INITIALS} . . . . **H2RI5_1**
go to the same school?
6. When your relationship with {INITIALS} began, where did {INITIALS} live? . . . . **H2RI6_1**
7. In what ways did you know {INITIALS} before your relationship began?
You went to the same school. . . . . **H2RI7A_1**
You went to the same church, synagogue, or place of worship. . . . . **H2RI7B_1**
You were neighbors. . . . . **H2RI7C_1**
You were casual acquaintances. . . . . **H2RI7D_1**
You were friends. . . . . **H2RI7E_1**
{INITIALS} was a friend of another friend of yours. . . . . **H2RI7F_1**
some other way. . . . . **H2RI7G_1**
You did not know {INITIALS} before your relationship began. . . . . **H2RI7H_1**
8. When your relationship with {INITIALS} began, how many of your . . . . **H2RI8_1**
close friends knew {INITIALS}?
9. Did {INITIALS} call you names, insult you, or treat you disrespectfully . . . . **H2RI9_1**
in front of others?

Question Variable Name

10. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI10M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI10Y1**
11. Did {INITIALS} swear at you? . . . . **H2RI11_1**
12. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI12M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI12Y1**
13. Did {INITIALS} threaten you with violence? . . . . **H2RI13_1**
14. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI14M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI14Y1**
15. Did {INITIALS} push or shove you? . . . . **H2RI15_1**
16. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI16M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI16Y1**
17. Did {INITIALS} throw something at you that could hurt you? . . . . **H2RI17_1**
18. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI18M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI18Y1**
19. Is your romantic relationship with {INITIALS} still going on? . . . . **H2RI19_1**
20. In what month [and year] did your relationship with {INITIALS} end? **H2RI20M1**
In what [month and] year did your relationship with {INITIALS} end? **H2RI20Y1**
21. When the romantic relationship with {INITIALS} ended, where . . . .**H2RI21_1**
did {INITIALS} live?
22. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . .**H2RI22_1**
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . **H2RI23_1**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the . .**H2RI24_1**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
25. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the . . **H2RI25_1**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} the school year before this past one?
26. *[If SCHOOL YEAR:]* What grade is {INITIALS} in now? . . . . **H2RI26_1**
[If SUMMER:] What grade was {INITIALS} in during the 1995-1996 school year?
27. How old is {INITIALS} now? . . . . **H2RI27_1**
28. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2RI28_1**
29. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2RI29A1**
Chicano/Chicana **H2RI29B1**
Cuban/Cuban American **H2RI29C1**
Puerto Rican **H2RI29D1**
Central/South American **H2RI29E1**
other Hispanic **H2RI29F1**
30. What is {INITIALS}'s race?
white **H2RI30A1**

Question	Variable Name
black or African American	**H2RI30B1**
American Indian or Native American	**H2RI30C1**
Asian or Pacific Islander	**H2RI30D1**
other	**H2RI30E1**
31. What is {INITIALS}'s Asian background?	
Chinese	**H2RI31A1**
Filipino	**H2RI31B1**
Japanese	**H2RI31C1**
Asian Indian	**H2RI31D1**
Korean	**H2RI31E1**
Vietnamese	**H2RI31F1**
other	**H2RI31G1**
32. What is {INITIALS}'s sex?	**H2RI32_1**
33. [letters of rejected cards]	
A. You went out together in a group.	**H2RI33A1**
B. You met your partner's parents.	**H2RI33B1**
C. You told other people that you were a couple.	**H2RI33C1**
D. You saw less of other friends so you could spend more time with your partner.	**H2RI33D1**
E. You and your partner went out together alone.	**H2RI33E1**
F. You held hands.	**H2RI33F1**
G. You gave each other presents.	**H2RI33G1**
H. You told each other that you loved each other	**H2RI33H1**
I. You thought of yourselves as a couple.	**H2RI33I1**
J. You talked about contraception or sexually transmitted diseases.	**H2RI33J1**
K. You kissed.	**H2RI33K1**
L. You touched each other under your clothing or with no clothes on.	**H2RI33L1**
M. You had sexual intercourse.	**H2RI33M1**
N. You touched each others' genitals (private parts).	**H2RI33N1**
O. Your partner or you got pregnant.	**H2RI33O1**
34. [ordered list of remaining cards]	
Enter the first thing that happened in your relationship with {INITIALS}.	**H2RI34A1**
Enter the next [second] thing that happened in your relationship	**H2RI34B1**
Enter the next [third] thing that happened in your relationship	**H2RI34C1**
Enter the next [fourth] thing that happened in your relationship	**H2RI34D1**
Enter the next [fifth] thing that happened in your relationship	**H2RI34E1**
Enter the next [sixth] thing that happened in your relationship	**H2RI34F1**
Enter the next [seventh] thing that happened in your relationship	**H2RI34G1**
Enter the next [eighth] thing that happened in your relationship	**H2RI34H1**
Enter the next [ninth] thing that happened in your relationship	**H2RI34I1**
Enter the next [tenth] thing that happened in your relationship	**H2RI34J1**
Enter the next [eleventh] thing that happened in your relationship	**H2RI34K1**
Enter the next [twelfth] thing that happened in your relationship	**H2RI34L1**

Question	Variable Name
Enter the next [thirteenth] thing that happened in your relationship	**H2RI34M1**
Enter the next [fourteenth] thing that happened in your relationship	**H2RI34N1**
Enter the next [fifteenth] thing that happened in your relationship	**H2RI34O1**
35. Have you had sexual intercourse with {INITIALS}?	**H2RI35_1**
36. *If R is male*: When you had sexual intercourse with {INITIALS} did you insert your penis into her vagina? *If R is female*: When you had sexual intercourse with {INITIALS} did he insert his penis into your vagina?	**H2RI36_1**
37. In what month [and year] did you first have sexual intercourse with {INITIALS}?	**H2RI37M1**
In what [month and] year did you first have sexual intercourse with {INITIALS}?	**H2RI37Y1**
38. In what month [and year] did you have sexual intercourse with {INITIALS} most recently?	**H2RI38M1**
In what [month and] year did you have sexual intercourse with {INITIALS} most recently?	**H2RI38Y1**
39. Did you and {INITIALS} have intercourse once, or more than once?	**H2RI39_1**
40. Did you or {INITIALS} use any method of birth control?	**H2RI40_1**
41. What method of birth control did you or your partner use?	**H2RI41A1**
What other method of birth control did you or your partner use?	**H2RI41B1**
What other method of birth control did you or your partner use?	**H2RI41C1**
42. Was a condom used when you had sexual intercourse with {INITIALS}?	**H2RI42_1**
43. During that month when you and {INITIALS} had sexual intercourse, did either of you ever use any method of birth control?	**H2RI43_1**
44. Did one or the other of you use some method of birth control every time you and {INITIALS} had intercourse?	**H2RI44_1**
45. What method of birth control did you or your partner use?	**H2RI45A1**
What other method of birth control did you or your partner use?	**H2RI45B1**
What other method of birth control did you or your partner use?	**H2RI45C1**
46. Was a condom ever used when you had sexual intercourse with {INITIALS}?	**H2RI46_1**
47. Did you and {INITIALS} use more than one birth control method at the same time, or did you use these methods at different times?	**H2RI47_1**
48. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had sexual intercourse, did one or the other of you ever use any method of birth control?	**H2RI48_1**
49. Throughout these months, did one or the other of you use some method of birth control every time you and {INITIALS} had sexual intercourse?	**H2RI49_1**
50. What method of birth control did you or your partner use?	**H2RI50A1**
What other method of birth control did you or your partner use?	**H2RI50B1**
What other method of birth control did you or your partner use?	**H2RI50C1**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}?	**H2RI51_1**
52. Did you and {INITIALS} use more than one birth control method at the same time, or did you use these methods at different times?	**H2RI52_1**

Question	Variable Name
53. About how many times have you and {INITIALS} had sexual intercourse since {FIRST DATE}?	**H2RI53_1**
54. Have you ever had anal intercourse with {INITIALS}?	**H2RI54_1**
55. In what month [and year] did you first have anal intercourse with {INITIALS}?	**H2RI55M1**
In what [month and] year did you first have anal intercourse with {INITIALS}?	**H2RI55Y1**
56. *If R is male:* Did you wear a condom the first time you had anal intercourse? *If R is female:* Did he wear a condom the first time you had anal intercourse?	**H2RI56_1**
57. In what month [and year] did you have anal intercourse with {INITIALS} most recently?	**H2RI57M1**
In what [month and] year did you have anal intercourse with {INITIALS} most recently?	**H2RI57Y1**
58. *If R is male:* About how many times have you and she had anal intercourse? *If R is female:* About how many times have you and he had anal intercourse?	**H2RI58_1**
59. *If R is male:* How often have you used a condom during anal intercourse with {INITIALS}? *If R is female:* How often has he used a condom during anal intercourse with you?	**H2RI59_1**
If male-male relationship, ask Q.60-71.	
60. Has {INITIALS} ever inserted his penis into your anus?	**H2RI60_1**
61. In what month [and year] did he do this with you the first time?	**H2RI61M1**
In what [month and] year did he do this with you the first time?	**H2RI61Y1**
62. Did he wear a condom the first time he did this with you?	**H2RI62_1**
63. In what month [and year] did he insert his penis into your anus most recently?	**H2RI63M1**
In what [month and] year did he insert his penis into your anus most recently?	**H2RI63Y1**
64. About how many times has {INITIALS} inserted his penis into your anus?	**H2RI64_1**
65. How often did {INITIALS} wear a condom when he did this with you?	**H2RI65_1**
66. Have you ever inserted your penis into {INITIALS}'s anus?	**H2RI66_1**
67. In what month [and year] did you do this with {INITIALS} the first time?	**H2RI67M1**
In what [month and] year did you do this with {INITIALS} the first time?	**H2RI67Y1**
68. Did you wear a condom the first time you did this with him?	**H2RI68_1**
69. In what month [and year] did you insert your penis into {INITIALS}'s anus most recently?	**H2RI69M1**
In what [month and] year did you insert your penis into {INITIAL}'s anus most recently?	**H2RI69Y1**
70. About how many times have you inserted your penis into his anus?	**H2RI70_1**
71. How often did you wear a condom when you did this with him?	**H2RI71_1**
Second Romantic Partner	
1. In what month [and year] did your romantic relationship with {INITIALS} begin?	**H2RI1M_2**
In what [month and] year did your romantic relationship with {INITIALS} begin?	**H2RI1Y_2**
2. How old was {INITIALS} when your romantic relationship began?	**H2RI2_2**
3. About how old was {INITIALS}?	**H2RI3_2**

Question Variable Name

4. What grade was {INITIALS} in at that time? . . . . **H2RI4_2**
5. When your relationship with {INITIALS} began, did you and {INITIALS} . . . . **H2RI5_2**
go to the same school?
6. When your relationship with {INITIALS} began, where did {INITIALS} live? . . **H2RI6_2**
7. In what ways did you know {INITIALS} before your relationship began?
You went to the same school. . . . . **H2RI7A_2**
You went to the same church, synagogue, or place of worship. . . . . **H2RI7B_2**
You were neighbors. . . . .**H2RI7C_2**
You were casual acquaintances. . . . . **H2RI7D_2**
You were friends. . . . . **H2RI7E_2**
{INITIALS} was a friend of another friend of yours. . . . .**H2RI7F_2**
some other way . . . . **H2RI7G_2**
You did not know {INITIALS} before your relationship began. . . . . **H2RI7H_2**
8. When your relationship with {INITIALS} began, how many of your . . . .**H2RI8_2**
close friends knew {INITIALS}?
9. Did {INITIALS} call you names, insult you, or treat you disrespectfully . . . .**H2RI9_2**
in front of others?
10. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI10M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI10Y2**
11. Did {INITIALS} swear at you? . . . .**H2RI11_2**
12. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI12M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI12Y2**
13. Did {INITIALS} threaten you with violence? . . . . **H2RI13_2**
14. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI14M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI14Y2**
15. Did {INITIALS} push or shove you? . . . . **H2RI15_2**
16. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI16M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI16Y2**
17. Did {INITIALS} throw something at you that could hurt you? . . . . **H2RI17_2**
18. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI18M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI18Y2**
19. Is your romantic relationship with {INITIALS} still going on? . . . .**H2RI19_2**
20. In what month [and year] did your relationship with {INITIALS} end? **H2RI20M2**
In what [month and] year did your relationship with {INITIALS} end? **H2RI20Y2**
21. When the romantic relationship with {INITIALS} ended, where . . . . **H2RI21_2**
did {INITIALS} live?
22. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . .**H2RI22_2**
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . **H2RI23_2**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the . . . **H2RI24_2**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the

Question Variable Name

1994-95 school year, in other words, the school year before this past one?
25. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the . . . **H2RI25_2**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
26. *[If SCHOOL YEAR:]* What grade is {INITIALS} in now? . . . . **H2RI26_2**
[If SUMMER:] What grade was {INITIALS} in during the 1995-1996 school year?
27. How old is {INITIALS} now? . . . . **H2RI27_2**
28. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2RI28_2**
29. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2RI29A2**
Chicano/Chicana **H2RI29B2**
Cuban/Cuban American **H2RI29C2**
Puerto Rican **H2RI29D2**
Central/South American **H2RI29E2**
other Hispanic **H2RI29F2**
30. What is {INITIALS}'s race?
white **H2RI30A2**
black or African American **H2RI30B2**
American Indian or Native American **H2RI30C2**
Asian or Pacific Islander **H2RI30D2**
other **H2RI30E2**
31. What is {INITIALS}'s Asian background?
Chinese **H2RI31A2**
Filipino **H2RI31B2**
Japanese **H2RI31C2**
Asian Indian **H2RI31D2**
Korean **H2RI31E2**
Vietnamese **H2RI31F2**
other **H2RI31G2**
32. What is {INITIALS}'s sex? . . . . **H2RI32_2**
33. [letters of rejected cards]
A. You went out together in a group. **H2RI33A2**
B. You met your partner's parents. **H2RI33B2**
C. You told other people that you were a couple. **H2RI33C2**
D. You saw less of other friends so you could spend more time with **H2RI33D2**
your partner.
E. You and your partner went out together alone. **H2RI33E2**
F. You held hands. **H2RI33F2**
G. You gave each other presents. **H2RI33G2**
H. You told each other that you loved each other **H2RI33H2**
I. You thought of yourselves as a couple. **H2RI33I2**
J. You talked about contraception or sexually transmitted diseases. **H2RI33J2**

Question Variable Name

K. You kissed. **H2RI33K2**
L. You touched each other under your clothing or with no clothes on. **H2RI33L2**
M. You had sexual intercourse. **H2RI33M2**
N. You touched each others' genitals (private parts). **H2RI33N2**
O. Your partner or you got pregnant. **H2RI33O2**
34. [ordered list of remaining cards]
Enter the first thing that happened in your relationship with {INITIALS}. **H2RI34A2**
Enter the next [second] thing that happened in your relationship **H2RI34B2**
Enter the next [third] thing that happened in your relationship **H2RI34C2**
Enter the next [fourth] thing that happened in your relationship **H2RI34D2**
Enter the next [fifth] thing that happened in your relationship **H2RI34E2**
Enter the next [sixth] thing that happened in your relationship **H2RI34F2**
Enter the next [seventh] thing that happened in your relationship **H2RI34G2**
Enter the next [eighth] thing that happened in your relationship **H2RI34H2**
Enter the next [ninth] thing that happened in your relationship **H2RI34I2**
Enter the next [tenth] thing that happened in your relationship **H2RI34J2**
Enter the next [eleventh] thing that happened in your relationship **H2RI34K2**
Enter the next [twelfth] thing that happened in your relationship **H2RI34L2**
Enter the next [thirteenth] thing that happened in your relationship **H2RI34M2**
Enter the next [fourteenth] thing that happened in your relationship **H2RI34N2**
Enter the next [fifteenth] thing that happened in your relationship **H2RI34O2**
35. Have you had sexual intercourse with {INITIALS}? . . . . **H2RI35_2**
36. *If R is male*: When you had sexual intercourse with {INITIALS} did you . . . . . . **H2RI36_2**
insert your penis into her vagina?
If R is female: When you had sexual intercourse with {INITIALS} did he
insert his penis into your vagina?
37. In what month [and year] did you first have sexual intercourse **H2RI37M2**
with {INITIALS}?
In what [month and] year did you first have sexual intercourse **H2RI37Y2**
with {INITIALS}?
38. In what month [and year] did you have sexual intercourse with {INITIALS} . . . **H2RI38M2**
most recently?
In what [month and] year did you have sexual intercourse with {INITIALS} **H2RI38Y2**
most recently?
39. Did you and {INITIALS} have intercourse once, or more than once? . . . . **H2RI39_2**
40. Did you or {INITIALS} use any method of birth control? . . . . **H2RI40_2**
41. What method of birth control did you or your partner use? **H2RI41A2**
What other method of birth control did you or your partner use? **H2RI41B2**
What other method of birth control did you or your partner use? **H2RI41C2**
42. Was a condom used when you had sexual intercourse with {INITIALS}? . . . . . **H2RI42_2**
43. During that month when you and {INITIALS} had sexual intercourse, did . . . . **H2RI43_2**
either of you ever use any method of birth control?
44. Did one or the other of you use some method of birth control every time . . . . . . **H2RI44_2**

Question Variable Name

you and {INITIALS} had intercourse?
45. What method of birth control did you or your partner use? **H2RI45A2**
What other method of birth control did you or your partner use? **H2RI45B2**
What other method of birth control did you or your partner use? **H2RI45C2**
46. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . **H2RI46_2**
47. Did you and {INITIALS} use more than one birth control method at the . . . . **H2RI47_2**
same time, or did you use these methods at different times?
48. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had . . **H2RI48_2**
sexual intercourse, did one or the other of you ever use any method of
birth control?
49. Throughout these months, did one or the other of you use some method . . . . **H2RI49_2**
of birth control every time you and {INITIALS} had intercourse?
50. What method of birth control did you or your partner use? **H2RI50A2**
What other method of birth control did you or your partner use? **H2RI50B2**
What other method of birth control did you or your partner use? **H2RI50C2**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . . **H2RI51_2**
52. Did you and {INITIALS} use more than one birth control method at the . . . . **H2RI52_2**
same time, or did you use these methods at different times?
53. About how many times have you and {INITIALS} had sexual intercourse . . . . **H2RI53_2**
since {FIRST DATE}?
54. Have you ever had anal intercourse with {INITIALS}? . . . . **H2RI54_2**
55. In what month [and year] did you first have anal intercourse with {INITIALS}? . . **H2RI55M2**
In what [month and] year did you first have anal intercourse with {INITIALS}? **H2RI55Y2**
56. *If R is male:* Did you wear a condom the first time you had anal intercourse? . . . . . **H2RI56_2**
If R is female: Did he wear a condom the first time you had anal intercourse?
57. In what month [and year] did you have anal intercourse with {INITIALS} **H2RI57M2**
most recently?
In what [month and] year did you have anal intercourse with {INITIALS} **H2RI57Y2**
most recently?
58. *If R is male:* About how many times have you and she had anal intercourse? . . . . . **H2RI58_2**
If R is female: About how many times have you and he had anal intercourse?
59. *If R is male:* How often have you used a condom during anal intercourse . . . . **H2RI59_2**
with {INITIALS}?
If R is female: How often has he used a condom during anal intercourse with you?
If male-male relationship, a s *k Q.60-71.*
60. Has {INITIALS} ever inserted his penis into . . . . **H2RI60_2**
your anus?
61. In what month [and year] did he do this with you the first time? **H2RI61M2**
In what [month and] year did he do this with you the first time? **H2RI61Y2**
62. Did he wear a condom the first time he did this with you? . . . . **H2RI62_2**
63. In what month [and year] did he insert his penis into your anus most recently? . **H2RI63M2**
In what [month and] year did he insert his penis into your anus most recently? **H2RI63Y2**
64. About how many times has {INITIALS} inserted his penis into your anus? . . . .**H2RI64_2**

Question Variable Name

65. How often did {INITIALS} wear a condom when he did this with you? . . . . . . **H2RI65_2**
66. Have you ever inserted your penis into {INITIALS}'s anus? . . . . **H2RI66_2**
67. In what month [and year] did you do this with {INITIALS} the first time? **H2RI67M2**
In what [month and] year did you do this with {INITIALS} the first time? **H2RI67Y2**
68. Did you wear a condom the first time you did this with him? . . . . **H2RI68_2**
69. In what month [and year] did you insert your penis into {INITIALS}'s **H2RI69M2**
anus most recently?
In what [month and] year did you insert your penis into {INITIAL}'s **H2RI69Y2**
anus most recently?
70. About how many times have you inserted your penis into his anus? . . . . **H2RI70_2**
71. How often did you wear a condom when you did this with him? . . . .**H2RI71_2**

Third Romantic Partner

1. In what month [and year] did your romantic relationship with . . . . **H2RI1M_3**
{INITIALS} begin?
In what [month and] year did your romantic relationship with . . . . **H2RI1Y_3**
{INITIALS} begin?
2. How old was {INITIALS} when your romantic relationship began? . . . . **H2RI2_3**
3. About how old was {INITIALS}? . . . . **H2RI3_3**
4. What grade was {INITIALS} in at that time? . . . . **H2RI4_3**
5. When your relationship with {INITIALS} began, did you and {INITIALS} . . . . .**H2RI5_3**
go to the same school?
6. When your relationship with {INITIALS} began, where did {INITIALS} live? . .**H2RI6_3**
7. In what ways did you know {INITIALS} before your relationship began?
You went to the same school. . . . . **H2RI7A_3**
You went to the same church, synagogue, or place of worship. . . . . **H2RI7B_3**
You were neighbors. . . . . **H2RI7C_3**
You were casual acquaintances. . . . . **H2RI7D_3**
You were friends. . . . . **H2RI7E_3**
{INITIALS} was a friend of another friend of yours. . . . . **H2RI7F_3**
some other way . . . . **H2RI7G_3**
You did not know {INITIALS} before your relationship began. . . . . **H2RI7H_3**
8. When your relationship with {INITIALS} began, how many of your . . . . **H2RI8_3**
close friends knew {INITIALS}?
9. Did {INITIALS} call you names, insult you, or treat you disrespectfully . . . . **H2RI9_3**
in front of others?
10. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI10M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI10Y3**
11. Did {INITIALS} swear at you? . . . . **H2RI11_3**
12. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI12M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI12Y3**
13. Did {INITIALS} threaten you with violence? . . . . **H2RI13_3**
14. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI14M3**

Question Variable Name

If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI14Y3**
15. Did {INITIALS} push or shove you? . . . . **H2RI15_3**
16. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI16M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI16Y3**
17. Did {INITIALS} throw something at you that could hurt you? . . . . **H2RI17_3**
18. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RI18M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RI18Y3**
19. Is your romantic relationship with {INITIALS} still going on? . . . . **H2RI19_3**
20. In what month [and year] did your relationship with {INITIALS} end? **H2RI20M3**
In what [month and] year did your relationship with {INITIALS} end? **H2RI20Y3**
21. When the romantic relationship with {INITIALS} ended, where . . . .**H2RI21_3**
did {INITIALS} live?
22. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . . . . **H2RI22_3**
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . **H2RI23_3**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the . **H2RI24_3**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
25. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the . . **H2RI25_3**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} the school year before
this past one?
26. *[If SCHOOL YEAR:]* What grade is {INITIALS} in now? . . . . **H2RI26_3**
[If SUMMER:] What grade was {INITIALS} in during the 1995-1996 school year?
27. How old is {INITIALS} now? . . . . **H2RI27_3**
28. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2RI28_3**
29. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2RI29A3**
Chicano/Chicana **H2RI29B3**
Cuban/Cuban American **H2RI29C3**
Puerto Rican **H2RI29D3**
Central/South American **H2RI29E3**
other Hispanic **H2RI29F3**
30. What is {INITIALS}'s race?
white **H2RI30A3**
black or African American **H2RI30B3**
American Indian or Native American **H2RI30C3**
Asian or Pacific Islander **H2RI30D3**
other **H2RI30E3**
31. What is {INITIALS}'s Asian background?
Chinese **H2RI31A3**

Question	Variable Name
Filipino	**H2RI31B3**
Japanese	**H2RI31C3**
Asian Indian	**H2RI31D3**
Korean	**H2RI31E3**
Vietnamese	**H2RI31F3**
other	**H2RI31G3**
32. What is {INITIALS}'s sex?	**H2RI32_3**
33. [letters of rejected cards]	
A. You went out together in a group.	**H2RI33A3**
B. You met your partner's parents.	**H2RI33B3**
C. You told other people that you were a couple.	**H2RI33C3**
D. You saw less of other friends so you could spend more time with your partner.	**H2RI33D3**
E. You and your partner went out together alone.	**H2RI33E3**
F. You held hands.	**H2RI33F3**
G. You gave each other presents.	**H2RI33G3**
H. You told each other that you loved each other	**H2RI33H3**
I. You thought of yourselves as a couple.	**H2RI33I3**
J. You talked about contraception or sexually transmitted diseases.	**H2RI33J3**
K. You kissed.	**H2RI33K3**
L. You touched each other under your clothing or with no clothes on.	**H2RI33L3**
M. You had sexual intercourse.	**H2RI33M3**
N. You touched each others' genitals (private parts).	**H2RI33N3**
O. Your partner or you got pregnant.	**H2RI33O3**
34. [ordered list of remaining cards]	
Enter the first thing that happened in your relationship with {INITIALS}.	**H2RI34A3**
Enter the next [second] thing that happened in your relationship	**H2RI34B3**
Enter the next [third] thing that happened in your relationship	**H2RI34C3**
Enter the next [fourth] thing that happened in your relationship	**H2RI34D3**
Enter the next [fifth] thing that happened in your relationship	**H2RI34E3**
Enter the next [sixth] thing that happened in your relationship	**H2RI34F3**
Enter the next [seventh] thing that happened in your relationship	**H2RI34G3**
Enter the next [eighth] thing that happened in your relationship	**H2RI34H3**
Enter the next [ninth] thing that happened in your relationship	**H2RI34I3**
Enter the next [tenth] thing that happened in your relationship	**H2RI34J3**
Enter the next [eleventh] thing that happened in your relationship	**H2RI34K3**
Enter the next [twelfth] thing that happened in your relationship	**H2RI34L3**
Enter the next [thirteenth] thing that happened in your relationship	**H2RI34M3**
Enter the next [fourteenth] thing that happened in your relationship	**H2RI34N3**
Enter the next [fifteenth] thing that happened in your relationship	**H2RI34O3**
35. Have you had sexual intercourse with {INITIALS}?	**H2RI35_3**
36. *If R is male*: When you had sexual intercourse with {INITIALS} did you insert your penis into her vagina?	**H2RI36_3**

Question	Variable Name
If R is female: When you had sexual intercourse with {INITIALS} did he insert his penis into your vagina?	
37. In what month [and year] did you first have sexual intercourse with {INITIALS}?	**H2RI37M3**
In what [month and] year did you first have sexual intercourse with {INITIALS}?	**H2RI37Y3**
38. In what month [and year] did you have sexual intercourse with {INITIALS} most recently?	**H2RI38M3**
In what [month and] year did you have sexual intercourse with {INITIALS} most recently?	**H2RI38Y3**
39. Did you and {INITIALS} have intercourse once, or more than once?	**H2RI39_3**
40. Did you or {INITIALS} use any method of birth control?	**H2RI40_3**
41. What method of birth control did you or your partner use?	**H2RI41A3**
What other method of birth control did you or your partner use?	**H2RI41B3**
What other method of birth control did you or your partner use?	**H2RI41C3**
42. Was a condom used when you had sexual intercourse with {INITIALS}?	**H2RI42_3**
43. During that month when you and {INITIALS} had sexual intercourse, did either of you ever use any method of birth control?	**H2RI43_3**
44. Did one or the other of you use some method of birth control every time you and {INITIALS} had intercourse?	**H2RI44_3**
45. What method of birth control did you or your partner use?	**H2RI45A3**
What other method of birth control did you or your partner use?	**H2RI45B3**
What other method of birth control did you or your partner use?	**H2RI45C3**
46. Was a condom ever used when you had sexual intercourse with {INITIALS}?	**H2RI46_3**
Section 25: Non-Relationship History—Audio CASI	
1. Since {MOLI}, have you ever had a romantic attraction to a female?	**H2NR1**
2. Since {MOLI}, have you ever had a romantic attraction to a male?	**H2NR2**
4. Since {MOLI},how many times have you given someone sex in exchange for drugs or money?	**H2NR4**
5. Not counting the people you have described as romantic relationships, since {MOLI}, have you had a sexual relationship with anyone?	**H2NR5**
If R = "male," ask Q.6-7.	
6. Have you ever touched another male's genitals, that is, his private parts?	**H2NR6**
7. Except during a medical exam, has another male ever touched your genitals?	**H2NR7**
8. Since {MOLI}, with how many people, in total, including romantic relationship partners, have you ever had a sexual relationship?	**H2NR8**
9. Since {MOLI}, with how many people, not including romantic relationship partners, have you had a sexual relationship?	**H2NR9**
10. Not counting the people you may have described as romantic relationship partners, have you ever had anal intercourse with anyone?	**H2NR10**
11. With how many people, including romantic relationship partners, have you ever had anal intercourse?	**H2NR11**

Question Variable Name

12. Since January 1, 1994, with how many people have you had anal intercourse? **H2NR12**
15. And have you had a sexual relationship with any other person? **H2NR15A**
And have you had a sexual relationship with any other person? **H2NR15B**

First Partner

16. Did you ever hold hand with {INITIALS}? . . . .**H2NR16_1**
17. Did you and {INITIALS} ever kiss on the mouth? . . . . **H2NR17_1**
18. Did you ever tell {INITIALS} you liked or loved him or her? . . . . **H2NR18_1**
Partner #1 NR data are in the RX section. . . . .**NRRXW2_1**
1. In what month [and year] did your romantic relationship with {INITIALS} begin? . . . . **H2RX1M_1**
In what [month and] year did your romantic relationship with {INITIALS} begin? . . . . **H2RX1Y_1**
2. How old was {INITIALS} when your romantic relationship began? . . . . **H2RX2_1**
3. About how old was {INITIALS}? . . . . **H2RX3_1**
4. What grade was {INITIALS} in at that time? . . . . **H2RX4_1**
5. When your relationship with {INITIALS} began, did you and {INITIALS} go to the same school? . . . . . . **H2RX5_1**
6. When your relationship with {INITIALS} began, where did {INITIALS} live? . . . **H2RX6_1**
7. In what ways did you know {INITIALS} before your relationship began?
You went to the same school. . . . . **H2RX7A_1**
You went to the same church, synagogue, or place of worship. . . . . **H2RX7B_1**
You were neighbors. . . . . **H2RX7C_1**
You were casual acquaintances. . . . . **H2RX7D_1**
You were friends. . . . . **H2RX7E_1**
{INITIALS} was a friend of another friend of yours. . . . . **H2RX7F_1**
some other way . . . .**H2RX7G_1**
You did not know {INITIALS} before your relationship began. . . . . **H2RX7H_1**
8. When your relationship with {INITIALS} began, how many of your close friends knew {INITIALS}? . . . .**H2RX8_1**
9. Did {INITIALS} call you names, insult you, or treat you disrespectfully in front of others? . . . .**H2RX9_1**
10. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX10M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX10Y1**
11. Did {INITIALS} swear at you? . . . . **H2RX11_1**
12. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX12M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX12Y1**
13. Did {INITIALS} threaten you with violence? . . . . **H2RX13_1**
14. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX14M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX14Y1**
15. Did {INITIALS} push or shove you? . . . . **H2RX15_1**
16. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX16M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX16Y1**

Question — Variable Name

17. Did {INITIALS} throw something at you that could hurt you? . . . . **H2RX17_1**
18. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX18M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX18Y1**
19. Is your romantic relationship with {INITIALS} still going on? . . . . **H2RX19_1**
20. In what month [and year] did your relationship with {INITIALS} end? **H2RX20M1**
In what [month and] year did your relationship with {INITIALS} end? **H2RX20Y1**
21. When the romantic relationship with {INITIALS} ended, where . . . . **H2RX21_1**
did {INITIALS} live?
22. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . . **H2RX22_1**
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . **H2RX23_1**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the . . **H2RX24_1**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
25. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the . . . **H2RX25_1**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} the school year before
this past one?
26. *[If SCHOOL YEAR:]* What grade is {INITIALS} in now? . . . . **H2RX26_1**
[If SUMMER:] What grade was {INITIALS} in during the 1995-1996 school year?
27. How old is {INITIALS} now? . . . . **H2RX27_1**
28. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2RX28_1**
29. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2RX29A1**
Chicano/Chicana **H2RX29B1**
Cuban/Cuban American **H2RX29C1**
Puerto Rican **H2RX29D1**
Central/South American **H2RX29E1**
other Hispanic **H2RX29F1**
30. What is {INITIALS}'s race?
white **H2RX30A1**
black or African American **H2RX30B1**
American Indian or Native American **H2RX30C1**
Asian or Pacific Islander **H2RX30D1**
other **H2RX30E1**
31. What is {INITIALS}'s Asian background?
Chinese **H2RX31A1**
Filipino **H2RX31B1**
Japanese **H2RX31C1**
Asian Indian **H2RX31D1**
Korean **H2RX31E1**

Question	Variable Name
Vietnamese	**H2RX31F1**
other	**H2RX31G1**
32. What is {INITIALS}'s sex?	**H2RX32_1**
33. [letters of rejected cards]	
A. You went out together in a group.	**H2RX33A1**
B. You met your partner's parents.	**H2RX33B1**
C. You told other people that you were a couple.	**H2RX33C1**
D. You saw less of other friends so you could spend more time with your partner.	**H2RX33D1**
E. You and your partner went out together alone.	**H2RX33E1**
F. You held hands.	**H2RX33F1**
G. You gave each other presents.	**H2RX33G1**
H. You told each other that you loved each other	**H2RX33H1**
I. You thought of yourselves as a couple.	**H2RX33I1**
J. You talked about contraception or sexually transmitted diseases.	**H2RX33J1**
K. You kissed.	**H2RX33K1**
L. You touched each other under your clothing or with no clothes on.	**H2RX33L1**
M. You had sexual intercourse.	**H2RX33M1**
N. You touched each others' genitals (private parts).	**H2RX33N1**
O. Your partner or you got pregnant.	**H2RX33O1**
34. [ordered list of remaining cards]	
Enter the first thing that happened in your relationship with {INITIALS}.	**H2RX34A1**
Enter the next [second] thing that happened in your relationship	**H2RX34B1**
Enter the next [third] thing that happened in your relationship	**H2RX34C1**
Enter the next [fourth] thing that happened in your relationship	**H2RX34D1**
Enter the next [fifth] thing that happened in your relationship	**H2RX34E1**
Enter the next [sixth] thing that happened in your relationship	**H2RX34F1**
Enter the next [seventh] thing that happened in your relationship	**H2RX34G1**
Enter the next [eighth] thing that happened in your relationship	**H2RX34H1**
Enter the next [ninth] thing that happened in your relationship	**H2RX34I1**
Enter the next [tenth] thing that happened in your relationship	**H2RX34J1**
Enter the next [eleventh] thing that happened in your relationship	**H2RX34K1**
Enter the next [twelfth] thing that happened in your relationship	**H2RX34L1**
Enter the next [thirteenth] thing that happened in your relationship	**H2RX34M1**
Enter the next [fourteenth] thing that happened in your relationship	**H2RX34N1**
Enter the next [fifteenth] thing that happened in your relationship	**H2RX34O1**
35. Have you had sexual intercourse with {INITIALS}?	**H2RX35_1**
36. *If R is male*: When you had sexual intercourse with {INITIALS} did you insert your penis into her vagina? *If R is female*: When you had sexual intercourse with {INITIALS} did he insert his penis into your vagina?	**H2RX36_1**
37. In what month [and year] did you first have sexual intercourse with {INITIALS}?	**H2RX37M1**

Question	Variable Name
In what [month and] year did you first have sexual intercourse with {INITIALS}?	**H2RX37Y1**
38. In what month [and year] did you have sexual intercourse with {INITIALS} most recently?	**H2RX38M1**
In what [month and] year did you have sexual intercourse with {INITIALS} most recently?	**H2RX38Y1**
39. Did you and {INITIALS} have intercourse once, or more than once?	**H2RX39_1**
40. Did you or {INITIALS} use any method of birth control?	**H2RX40_1**
41. What method of birth control did you or your partner use?	**H2RX41A1**
What other method of birth control did you or your partner use?	**H2RX41B1**
What other method of birth control did you or your partner use?	**H2RX41C1**
42. Was a condom used when you had sexual intercourse with {INITIALS}?	**H2RX42_1**
43. During that month when you and {INITIALS} had sexual intercourse, did either of you ever use any method of birth control?	**H2RX43_1**
44. Did one or the other of you use some method of birth control every time you and {INITIALS} had intercourse?	**H2RX44_1**
45. What method of birth control did you or your partner use?	**H2RX45A1**
What other method of birth control did you or your partner use?	**H2RX45B1**
What other method of birth control did you or your partner use?	**H2RX45C1**
46. Was a condom ever used when you had sexual intercourse with {INITIALS}?	**H2RX46_1**
47. Did you and {INITIALS} use more than one birth control method at the same time, or did you use these methods at different times?	**H2RX47_1**
48. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had sexual intercourse, did one or the other of you ever use any method of birth control?	**H2RX48_1**
49. Throughout these months, did one or the other of you use some method of birth control every time you and {INITIALS} had intercourse?	**H2RX49_1**
50. What method of birth control did you or your partner use?	**H2RX50A1**
What other method of birth control did you or your partner use?	**H2RX50B1**
What other method of birth control did you or your partner use?	**H2RX50C1**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}?	**H2RX51_1**
52. Did you and {INITIALS} use more than one birth control method at the same time, or did you use these methods at different times?	**H2RX52_1**
53. About how many times have you and {INITIALS} had sexual intercourse since {FIRST DATE}?	**H2RX53_1**
54. Have you ever had anal intercourse with {INITIALS}?	**H2RX54_1**
55. In what month [and year] did you first have anal intercourse with {INITIALS}?	**H2RX55M1**
In what [month and] year did you first have anal intercourse with {INITIALS}?	**H2RX55Y1**
56. *If R is male:* Did you wear a condom the first time you had anal intercourse? *If R is female:* Did he wear a condom the first time you had anal intercourse?	**H2RX56_1**
57. In what month [and year] did you have anal intercourse with {INITIALS} most recently?	**H2RX57M1**
In what [month and] year did you have anal intercourse with {INITIALS}	**H2RX57Y1**

Question Variable Name

most recently?

58. *If R is male:* About how many times have you and she had anal intercourse? . . . . .**H2RX58_1**
If R is female: About how many times have you and he had anal intercourse?
59. *If R is male:* How often have you used a condom during anal intercourse . . . .**H2RX59_1**
with {INITIALS}?
If R is female: How often has he used a condom during anal intercourse with you?
If male-male relationship, ask Q.60-71.
60. Has {INITIALS} ever inserted his penis into . . . . **H2RX60_1**
your anus?
61. In what month [and year] did he do this with you the first time? **H2RX61M1**
In what [month and] year did he do this with you the first time? **H2RX61Y1**
62. Did he wear a condom the first time he did this with you? . . . . **H2RX62_1**
63. In what month [and year] did he insert his penis into your anus most recently? . . .**H2RX63M1**
In what [month and] year did he insert his penis into your anus most recently? **H2RX63Y1**
64. About how many times has {INITIALS} inserted his penis into your anus? . . . . . . **H2RX64_1**
65. How often did {INITIALS} wear a condom when he did this with you? . . . . **H2RX65_1**
66. Have you ever inserted your penis into {INITIALS}'s anus? . . . .**H2RX66_1**
67. In what month [and year] did you do this with {INITIALS} the first time? **H2RX67M1**
In what [month and] year did you do this with {INITIALS} the first time? **H2RX67Y1**
68. Did you wear a condom the first time you did this with him? . . . . **H2RX68_1**
69. In what month [and year] did you insert your penis into {INITIALS}'s **H2RX69M1**
anus most recently?
In what [month and] year did you insert your penis into {INITIAL}'s **H2RX69Y1**
anus most recently?
70. About how many times have you inserted your penis into his anus? . . . . **H2RX70_1**
71. How often did you wear a condom when you did this with him? . . . . **H2RX71_1**
19. How old is {INITIALS}? . . . .**H2NR19_1**
20 *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . . **H2NR20_1**
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?
21. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . **H2NR21_1**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} this past school year?
22. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the. . **H2NR22_1**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
23. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the . . . **H2NR23_1**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
24. What is {INITIALS}'s sex? . . . . **H2NR24_1**
25. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2NR25_1**
26. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2NR26A1**

Question	Variable Name
Chicano/Chicana	**H2NR26B1**
Cuban/Cuban American	**H2NR26C1**
Puerto Rican	**H2NR26D1**
Central/South American	**H2NR26E1**
other Hispanic	**H2NR26F1**
27. What is {INITIALS}'s race?	
white	**H2NR27A1**
black or African American	**H2NR27B1**
American Indian or Native American	**H2NR27C1**
Asian or Pacific Islander	**H2NR27D1**
other	**H2NR27E1**
28. What is {INITIALS}'s Asian background?	
Chinese	**H2NR28A1**
Filipino	**H2NR28B1**
Japanese	**H2NR28C1**
Asian Indian	**H2NR28D1**
Korean	**H2NR28E1**
Vietnamese	**H2NR28F1**
other	**H2NR28G1**
29. Before you first had sex with {INITIALS}, in what ways did you know each other?	
You went to the same school.	**H2NR29A_1**
You went to the same church, synagogue, or place of worship.	**H2NR29B_1**
You were neighbors.	**H2NR29C_1**
You were casual acquaintances.	**H2NR29D_1**
You were friends.	**H2NR29E_1**
{INITIALS} was a friend of another friend of yours.	**H2NR29F_1**
some other way	**H2NR29G_1**
You did not know {INITIALS} before you had sex.	**H2NR29H_1**
30. When you had sex with {INITIALS} most recently, where did {HE/SHE} live?	**H2NR30_1**
31. Did {INITIALS} call you names, insult you, or treat you disrespectfully in front of others?	**H2NR31_1**
32. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR32M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR32Y1**
33. Did {INITIALS} swear at you?	**H2NR33_1**
34. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR34M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR34Y1**
35. Did {INITIALS} threaten you with violence?	**H2NR35_1**
36. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR36M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR36Y1**
37. Did {INITIALS} push or shove you?	**H2NR37_1**
38. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR38M1**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR38Y1**
39. Did {INITIALS} throw something at you that could hurt you?	**H2NR39_1**

Question — Variable Name

40. *If "yes," ask:* I what month [and year] did {INITIALS} first do this? **H2NR40M1**
If "yes," ask: I what [month and] year did {INITIALS} first do this? **H2NR40Y1**
41. Have you had sexual intercourse with {INITIALS}? . . . . **H2NR41_1**
42. In what month [and year] did you first have sexual intercourse **H2NR42M1**
with {INITIALS}?
In what [month and] year did you first have sexual intercourse **H2NR42Y1**
with {INITIALS}?
43. In what month [and year] did you have sexual intercourse with {INITIALS} **H2NR43M1**
most recently?
In what [month and] year did you have sexual intercourse with {INITIALS} **H2NR43Y1**
most recently?
44. Did you and {INITIALS} have intercourse once, or more than once? . . . . **H2NR44_1**
45. Did you or {INITIALS} use any method of birth control? . . . . **H2NR45_1**
46. What method of birth control did you or your partner use? **H2NR46A1**
What other method of birth control did you or your partner use? **H2NR46B1**
What other method of birth control did you or your partner use? **H2NR46C1**
47. Was a condom used when you had sexual intercourse with {INITIALS}? . . . .**H2NR47_1**
48. During that month when you and {INITIALS} had sexual intercourse, did . . . .**H2NR48_1**
either of you ever use any method of birth control?
49. Did one or the other of you use some method of birth control every time . . . . **H2NR49_1**
you and {INITIALS} had intercourse?
50. What method of birth control did you or your partner use? **H2NR50A1**
What other method of birth control did you or your partner use? **H2NR50B1**
What other method of birth control did you or your partner use? **H2NR50C1**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . . .**H2NR51_1**
52. Did you and {INITIALS} use more than one birth control method at the . . . .**H2NR52_1**
same time, or did you use these methods at different times?
53. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had . . **H2NR53_1**
sexual intercourse, did one or the other of you ever use any method of
birth control?
54. Throughout these months, did one or the other of you use some method . . . . . **H2NR54_1**
of birth control every time you and {INITIALS} had intercourse?
55. What method of birth control did you or your partner use? **H2NR55A1**
What other method of birth control did you or your partner use? **H2NR55B1**
What other method of birth control did you or your partner use? **H2NR55C1**
56. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . **H2NR56_1**
57. Did you and {INITIALS} use more than one birth control method at the . . . . **H2NR57_1**
same time, or did you use these methods at different times?
58. About how many times have you and {INITIALS} had sexual intercourse . . . . . . **H2NR58_1**
since {FIRST DATE}?
59. Have you ever had anal intercourse with {INITIALS}? . . . . **H2NR59_1**
60. In what month [and year] did you first have anal intercourse with {INITIALS}? . **H2NR60M1**
In what [month and] year did you first have anal intercourse with {INITIALS}? **H2NR60Y1**

Question Variable Name

61. *If R is male:* Did you wear a condom the first time you had anal intercourse? . . . . **H2NR61_1**
If R is female: Did he wear a condom the first time you had anal intercourse?
62. In what month [and year] did you have anal intercourse with {INITIALS} . . . . . **H2NR62M1** most recently?
In what [month and] year did you have anal intercourse with {INITIALS} . . . . **H2NR62Y1** most recently?
63. *If R is male:* About how many times have you and she had anal intercourse? . . . . .**H2NR63_1**
If R is female: About how many times have you and he had anal intercourse?
64. *If R is male:* How often have you used a condom during anal intercourse . . . .**H2NR64_1** with {INITIALS}?
If R is female: How often has he used a condom during anal intercourse with you?
If male-male relationship, ask Q.65-76
65. Has {INITIALS} ever inserted his penis into . . . . **H2NR65_1** your anus?
66. In what month [and year] did he do this with you the first time? **H2NR66M1**
In what [month and] year did he do this with you the first time? **H2NR66Y1**
67. Did he wear a condom the first time he did this with you? . . . .**H2NR67_1**
68. In what month [and year] did he insert his penis into your anus most recently? . . .**H2NR68M1**
In what [month and] year did he insert his penis into your anus most recently? **H2NR68Y1**
69. About how many times has {INITIALS} inserted his penis into your anus? . . . . . . **H2NR69_1**
70. How often did {INITIALS} wear a condom when he did this with you? . . . . **H2NR70_1**
71. Have you ever inserted your penis into {INITIALS}'s anus? . . . .**H2NR71_1**
72. In what month [and year] did you do this with {INITIALS} the first time? **H2NR72M1**
In what [month and] year did you do this with {INITIALS} the first time? **H2NR72Y1**
73. Did you wear a condom the first time you did this with him? . . . .**H2NR73_1**
74. In what month [and year] did you insert your penis into {INITIALS}'s . . . . **H2NR74M1** anus most recently?
In what [month and] year did you insert your penis into {INITIAL}'s . . . . **H2NR74Y1** anus most recently?
75. About how many times have you inserted your penis into his anus? . . . . **H2NR75_1**
76. How often did you wear a condom when you did this with him? . . . . **H2NR76_1**
77. Did you ever give {INITIALS} sex in exchange for drugs or money? . . . . **H2NR77_1**
78. How many times did you give {INITIALS} sex in exchange for drugs or money? . **H2NR78_1**

Second Partner

16. Did you ever hold hand with {INITIALS}? . . . .**H2NR16_2**
17. Did you and {INITIALS} ever kiss on the mouth? . . . . **H2NR17_2**
18. Did you ever tell {INITIALS} you liked or loved him or her? . . . . **H2NR18_2**
Partner #2 NR data are in the RX section. . . . .**NRRXW2_2**
1. In what month [and year] did your romantic relationship with . . . . **H2RX1M_2** {INITIALS} begin?
In what [month and] year did your romantic relationship with . . . . **H2RX1Y_2** {INITIALS} begin?

Question	Variable Name
2. How old was {INITIALS} when your romantic relationship began?	**H2RX2_2**
3. About how old was {INITIALS}?	**H2RX3_2**
4. What grade was {INITIALS} in at that time?	**H2RX4_2**
5. When your relationship with {INITIALS} began, did you and {INITIALS} . . . . go to the same school?	**H2RX5_2**
6. When your relationship with {INITIALS} began, where did {INITIALS} live?	**H2RX6_2**
7. In what ways did you know {INITIALS} before your relationship began?	
You went to the same school.	**H2RX7A_2**
You went to the same church, synagogue, or place of worship.	**H2RX7B_2**
You were neighbors.	**H2RX7C_2**
You were casual acquaintances.	**H2RX7D_2**
You were friends.	**H2RX7E_2**
{INITIALS} was a friend of another friend of yours.	**H2RX7F_2**
some other way	**H2RX7G_2**
You did not know {INITIALS} before your relationship began.	**H2RX7H_2**
8. When your relationship with {INITIALS} began, how many of your . . . . close friends knew {INITIALS}?	**H2RX8_2**
9. Did {INITIALS} call you names, insult you, or treat you disrespectfully . . . . in front of others?	**H2RX9_2**
10. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2RX10M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2RX10Y2**
11. Did {INITIALS} swear at you?	**H2RX11_2**
12. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2RX12M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2RX12Y2**
13. Did {INITIALS} threaten you with violence?	**H2RX13_2**
14. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2RX14M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2RX14Y2**
15. Did {INITIALS} push or shove you?	**H2RX15_2**
16. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2RX16M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2RX16Y2**
17. Did {INITIALS} throw something at you that could hurt you?	**H2RX17_2**
18. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2RX18M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2RX18Y2**
19. Is your romantic relationship with {INITIALS} still going on?	**H2RX19_2**
20. In what month [and year] did your relationship with {INITIALS} end?	**H2RX20M2**
In what [month and] year did your relationship with {INITIALS} end?	**H2RX20Y2**
21. When the romantic relationship with {INITIALS} ended, where . . . . did {INITIALS} live?	**H2RX21_2**
22. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . . *[If SUMMER:]* Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?	**H2RX22_2**
23. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . *[If SUMMER:]* Did {INITIALS} go to {SISTER SCHOOL} this past school year?	**H2RX23_2**
24. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the . .	**H2RX24_2**

Question Variable Name

1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the 1994-95 school year, in other words, the school year before this past one?

25. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the 1994-95 school year, in other words, last school year? . . . **H2RX25_2**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} the school year before this past one?

26. *[If SCHOOL YEAR:]* What grade is {INITIALS} in now? . . . . **H2RX26_2**
[If SUMMER:] What grade was {INITIALS} in during the 1995-1996 school year?

27. How old is {INITIALS} now? . . . . **H2RX27_2**

28. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2RX28_2**

29. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2RX29A2**
Chicano/Chicana **H2RX29B2**
Cuban/Cuban American **H2RX29C2**
Puerto Rican **H2RX29D2**
Central/South American **H2RX29E2**
other Hispanic **H2RX29F2**

30. What is {INITIALS}'s race?
white **H2RX30A2**
black or African American **H2RX30B2**
American Indian or Native American **H2RX30C2**
Asian or Pacific Islander **H2RX30D2**
other **H2RX30E2**

31. What is {INITIALS}'s Asian background?
Chinese **H2RX31A2**
Filipino **H2RX31B2**
Japanese **H2RX31C2**
Asian Indian **H2RX31D2**
Korean **H2RX31E2**
Vietnamese **H2RX31F2**
other **H2RX31G2**

32. What is {INITIALS}'s sex? . . . . **H2RX32_2**

33. [letters of rejected cards]
A. You went out together in a group. **H2RX33A2**
B. You met your partner's parents. **H2RX33B2**
C. You told other people that you were a couple. **H2RX33C2**
D. You saw less of other friends so you could spend more time with your partner. **H2RX33D2**
E. You and your partner went out together alone. **H2RX33E2**
F. You held hands. **H2RX33F2**
G. You gave each other presents. **H2RX33G2**
H. You told each other that you loved each other **H2RX33H2**

Question Variable Name

I. You thought of yourselves as a couple. **H2RX33I2**
J. You talked about contraception or sexually transmitted diseases. **H2RX33J2**
K. You kissed. **H2RX33K2**
L. You touched each other under your clothing or with no clothes on. **H2RX33L2**
M. You had sexual intercourse. **H2RX33M2**
N. You touched each others' genitals (private parts). **H2RX33N2**
O. You or your partner got pregnant. **H2RX33O2**
34. [ordered list of remaining cards]
Enter the first thing that happened in your relationship with {INITIALS}. **H2RX34A2**
Enter the next [second] thing that happened in your relationship **H2RX34B2**
Enter the next [third] thing that happened in your relationship **H2RX34C2**
Enter the next [fourth] thing that happened in your relationship **H2RX34D2**
Enter the next [fifth] thing that happened in your relationship **H2RX34E2**
Enter the next [sixth] thing that happened in your relationship **H2RX34F2**
Enter the next [seventh] thing that happened in your relationship **H2RX34G2**
Enter the next [eighth] thing that happened in your relationship **H2RX34H2**
Enter the next [ninth] thing that happened in your relationship **H2RX34I2**
Enter the next [tenth] thing that happened in your relationship **H2RX34J2**
Enter the next [eleventh] thing that happened in your relationship **H2RX34K2**
Enter the next [twelfth] thing that happened in your relationship **H2RX34L2**
Enter the next [thirteenth] thing that happened in your relationship **H2RX34M2**
Enter the next [fourteenth] thing that happened in your relationship **H2RX34N2**
Enter the next [fifteenth] thing that happened in your relationship **H2RX34O2**
35. Have you had sexual intercourse with {INITIALS}? . . . . **H2RX35_2**
36. *If R is male*: When you had sexual intercourse with {INITIALS} did you . . . . .**H2RX36_2**
insert your penis into her vagina?
If R is female: When you had sexual intercourse with {INITIALS} did he
insert his penis into your vagina?
37. In what month [and year] did you first have sexual intercourse **H2RX37M2**
with {INITIALS}?
In what [month and] year did you first have sexual intercourse **H2RX37Y2**
with {INITIALS}?
38. In what month [and year] did you have sexual intercourse with {INITIALS} **H2RX38M2**
most recently?
In what [month and] year did you have sexual intercourse with {INITIALS} **H2RX38Y2**
most recently?
39. Did you and {INITIALS} have intercourse once, or more than once? . . . . **H2RX39_2**
40. Did you or {INITIALS} use any method of birth control? . . . . **H2RX40_2**
41. What method of birth control did you or your partner use? **H2RX41A2**
What other method of birth control did you or your partner use? **H2RX41B2**
What other method of birth control did you or your partner use? **H2RX41C2**
42. Was a condom used when you had sexual intercourse with {INITIALS}? . . . . **H2RX42_2**
43. During that month when you and {INITIALS} had sexual intercourse, did . . . . . . **H2RX43_2**

Question Variable Name

either of you ever use any method of birth control?
44. Did one or the other of you use some method of birth control every time . . . . **H2RX44_2**
you and {INITIALS} had intercourse?
45. What method of birth control did you or your partner use? **H2RX45A2**
What other method of birth control did you or your partner use? **H2RX45B2**
What other method of birth control did you or your partner use? **H2RX45C2**
46. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . . **H2RX46_2**
47. Did you and {INITIALS} use more than one birth control method at the . . . . **H2RX47_2**
same time, or did you use these methods at different times?
48. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had . . **H2RX48_2**
sexual intercourse, did one or the other of you ever use any method of
birth control?
49. Throughout these months, did one or the other of you use some method . . . . **H2RX49_2**
of birth control every time you and {INITIALS} had intercourse?
50. What method of birth control did you or your partner use? **H2RX50A2**
What other method of birth control did you or your partner use? **H2RX50B2**
What other method of birth control did you or your partner use? **H2RX50C2**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . . .**H2RX51_2**
52. Did you and {INITIALS} use more than one birth control method at the . . . . **H2RX52_2**
same time, or did you use these methods at different times?
53. About how many times have you and {INITIALS} had sexual intercourse . . . . **H2RX53_2**
since {FIRST DATE}?
54. Have you ever had anal intercourse with {INITIALS}? . . . . **H2RX54_2**
55. In what month [and year] did you first have anal intercourse with {INITIALS}? . **H2RX55M2**
In what [month and] year did you first have anal intercourse with {INITIALS}? **H2RX55Y2**
56. *If R is male:* Did you wear a condom the first time you had anal intercourse? . . . . **H2RX56_2**
If R is female: Did he wear a condom the first time you had anal intercourse?
57. In what month [and year] did you have anal intercourse with {INITIALS} **H2RX57M2**
most recently?
In what [month and] year did you have anal intercourse with {INITIALS} **H2RX57Y2**
most recently?
58. *If R is male:* About how many times have you and she had anal intercourse? . . . . .**H2RX58_2**
If R is female: About how many times have you and he had anal intercourse?
59. *If R is male:* How often have you used a condom during anal intercourse . . . .**H2RX59_2**
with {INITIALS}?
If R is female: How often has he used a condom during anal intercourse with you?
If male-male relationship, ask Q.66-71
60. Has {INITIALS} ever inserted his penis into . . . . **H2RX60_2**
your anus?
61. In what month [and year] did he do this with you the first time? **H2RX61M2**
In what [month and] year did he do this with you the first time? **H2RX61Y2**
62. Did he wear a condom the first time he did this with you? . . . . **H2RX62_2**
63. In what month [and year] did he insert his penis into your anus most recently? . . .**H2RX63M2**

Question	Variable Name
In what [month and] year did he insert his penis into your anus most recently?	**H2RX63Y2**
64. About how many times has {INITIALS} inserted his penis into your anus?	**H2RX64_2**
65. How often did {INITIALS} wear a condom when he did this with you?	**H2RX65_2**
66. Have you ever inserted your penis into {INITIALS}'s anus?	**H2RX66_2**
67. In what month [and year] did you do this with {INITIALS} the first time?	**H2RX67M2**
In what [month and] year did you do this with {INITIALS} the first time?	**H2RX67Y2**
68. Did you wear a condom the first time you did this with him?	**H2RX68_2**
69. In what month [and year] did you insert your penis into {INITIALS}'s anus most recently?	**H2RX69M2**
In what [month and] year did you insert your penis into {INITIAL}'s anus most recently?	**H2RX69Y2**
70. About how many times have you inserted your penis into his anus?	**H2RX70_2**
71. How often did you wear a condom when you did this with him?	**H2RX71_2**
19. How old is {INITIALS}?	**H2NR19_2**
20 *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? *[If SUMMER:]* Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?	**H2NR20_2**
21. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? *[If SUMMER:]* Did {INITIALS} go to {SISTER SCHOOL} this past school year?	**H2NR21_2**
22. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the 1994-95 school year, in other words, last school year? *[If SUMMER:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the 1994-95 school year, in other words, the school year before this past one?	**H2NR22_2**
23. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the 1994-95 school year, in other words, last school year? *[If SUMMER:]* Did {INITIALS} go to {SISTER SCHOOL} during the 1994-95 school year, in other words, the school year before this past one?	**H2NR23_2**
24. What is {INITIALS}'s sex?	**H2NR24_2**
25. Is {INITIALS} of Hispanic or Latino origin?	**H2NR25_2**
26. What is {INITIALS}'s Hispanic or Latino background?	
Mexican/Mexican American	**H2NR26A2**
Chicano/Chicana	**H2NR26B2**
Cuban/Cuban American	**H2NR26C2**
Puerto Rican	**H2NR26D2**
Central/South American	**H2NR26E2**
other Hispanic	**H2NR26F2**
27. What is {INITIALS}'s race?	
white	**H2NR27A2**
black or African American	**H2NR27B2**
American Indian or Native American	**H2NR27C2**
Asian or Pacific Islander	**H2NR27D2**
other	**H2NR27E2**
28. What is {INITIALS}'s Asian background?	
Chinese	**H2NR28A2**

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Filipino **H2NR28B2**
Japanese **H2NR28C2**
Asian Indian **H2NR28D2**
Korean **H2NR28E2**
Vietnamese **H2NR28F2**
other **H2NR28G2**
29. Before you first had sex with {INITIALS}, in what ways did you know each other?
You went to the same school. . . . . **H2NR29A_2**
You went to the same church, synagogue, or place of worship. . . . .**H2NR29B_2**
You were neighbors. . . . . **H2NR29C_2**
You were casual acquaintances. . . . . **H2NR29D_2**
You were friends. . . . . **H2NR29E_2**
{INITIALS} was a friend of another friend of yours. . . . . **H2NR29F_2**
some other way . . . . **H2NR29G_2**
You did not know {INITIALS} before you had sex. . . . .**H2NR29H_2**
30. When you had sex with {INITIALS} most recently, where did {HE/SHE} live? . . **H2NR30_2**
31. Did {INITIALS} call you names, insult you, or treat you disrespectfully . . . . **H2NR31_2**
in front of others?
32. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2NR32M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2NR32Y2**
33. Did {INITIALS} swear at you? . . . . **H2NR33_2**
34. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2NR34M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2NR34Y2**
35. Did {INITIALS} threaten you with violence? . . . . **H2NR35_2**
36. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2NR36M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2NR36Y2**
37. Did {INITIALS} push or shove you? . . . . **H2NR37_2**
38. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2NR38M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2NR38Y2**
39. Did {INITIALS} throw something at you that could hurt you? . . . .**H2NR39_2**
40. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2NR40M2**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2NR40Y2**
41. Have you had sexual intercourse with {INITIALS}? . . . . **H2NR41_2**
42. In what month [and year] did you first have sexual intercourse **H2NR42M2**
with {INITIALS}?
In what [month and] year did you first have sexual intercourse **H2NR42Y2**
with {INITIALS}?
43. In what month [and year] did you have sexual intercourse with {INITIALS} **H2NR43M2**
most recently?
In what [month and] year did you have sexual intercourse with {INITIALS} **H2NR43Y2**
most recently?
44. Did you and {INITIALS} have intercourse once, or more than once? . . . . **H2NR44_2**
45. Did you or {INITIALS} use any method of birth control? . . . . **H2NR45_2**

Question Variable Name

46. What method of birth control did you or your partner use? **H2NR46A2**
What other method of birth control did you or your partner use? **H2NR46B2**
What other method of birth control did you or your partner use? **H2NR46C2**
47. Was a condom used when you had sexual intercourse with {INITIALS}? . . . . **H2NR47_2**
48. During that month when you and {INITIALS} had sexual intercourse, did . . . . . . **H2NR48_2**
either of you ever use any method of birth control?
49. Did one or the other of you use some method of birth control every time . . . . **H2NR49_2**
you and {INITIALS} had intercourse?
50. What method of birth control did you or your partner use? **H2NR50A2**
What other method of birth control did you or your partner use? **H2NR50B2**
What other method of birth control did you or your partner use? **H2NR50C2**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . . **H2NR51_2**
52. Did you and {INITIALS} use more than one birth control method at the . . . . **H2NR52_2**
same time, or did you use these methods at different times?
53. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had . . **H2NR53_2**
sexual intercourse, did one or the other of you ever use any method of
birth control?
54. Throughout these months, did one or the other of you use some method . . . . **H2NR54_2**
of birth control every time you and {INITIALS} had intercourse?
55. What method of birth control did you or your partner use? **H2NR55A2**
What other method of birth control did you or your partner use? **H2NR55B2**
What other method of birth control did you or your partner use? **H2NR55C2**
56. Was a condom ever used when you had sexual intercourse with {INITIALS}? . **H2NR56_2**
57. Did you and {INITIALS} use more than one birth control method at the . . . . . . **H2NR57_2**
same time, or did you use these methods at different times?
58. About how many times have you and {INITIALS} had sexual intercourse . . . . **H2NR58_2**
since {FIRST DATE}?
59. Have you ever had anal intercourse with {INITIALS}? . . . . **H2NR59_2**
60. In what month [and year] did you first have anal intercourse with {INITIALS}? . **H2NR60M2**
In what [month and] year did you first have anal intercourse with {INITIALS}? **H2NR60Y2**
61. *If R is male:* Did you wear a condom the first time you had anal intercourse? . . . . **H2NR61_2**
If R is female: Did he wear a condom the first time you had anal intercourse?
62. In what month [and year] did you have anal intercourse with {INITIALS} **H2NR62M2**
most recently?
In what [month and] year did you have anal intercourse with {INITIALS} **H2NR62Y2**
most recently?
63. *If R is male:* About how many times have you and she had anal intercourse? . . . . **H2NR63_2**
If R is female: About how many times have you and he had anal intercourse?
64. *If R is male:* How often have you used a condom during anal intercourse . . . . **H2NR64_2**
with {INITIALS}?
If R is female: How often has he used a condom during anal intercourse with you?
If male-male relationship, ask Q.65-76.
65. Has {INITIALS} ever inserted his penis into . . . . **H2NR65_2**

Question Variable Name

your anus?
66. In what month [and year] did he do this with you the first time? **H2NR66M2**
In what [month and] year did he do this with you the first time? **H2NR66Y2**
67. Did he wear a condom the first time he did this with you? . . . . **H2NR67_2**
68. In what month [and year] did he insert his penis into your anus most recently? . . . **H2NR68M2**
In what [month and] year did he insert his penis into your anus most recently? **H2NR68Y2**
69. About how many times has {INITIALS} inserted his penis into your anus? . . . . . . **H2NR69_2**
70. How often did {INITIALS} wear a condom when he did this with you? . . . . **H2NR70_2**
71. Have you ever inserted your penis into {INITIALS}'s anus? . . . . **H2NR71_2**
72. In what month [and year] did you do this with {INITIALS} the first time? **H2NR72M2**
In what [month and] year did you do this with {INITIALS} the first time? **H2NR72Y2**
73. Did you wear a condom the first time you did this with him? . . . . **H2NR73_2**
74. In what month [and year] did you insert your penis into {INITIALS}'s **H2NR74M2**
anus most recently?
In what [month and] year did you insert your penis into {INITIAL}'s **H2NR74Y2**
anus most recently?
75. About how many times have you inserted your penis into his anus? . . . . **H2NR75_2**
76. How often did you wear a condom when you did this with him? . . . . **H2NR76_2**
77. Did you ever give {INITIALS} sex in exchange for drugs or money? . . . . **H2NR77_2**
78. How many times did you give {INITIALS} sex in exchange for drugs or money?. **H2NR78_2**

Third Partner

16. Did you ever hold hand with {INITIALS}? . . . . **H2NR16_3**
17. Did you and {INITIALS} ever kiss on the mouth? . . . . **H2NR17_3**
18. Did you ever tell {INITIALS} you liked or loved him or her? . . . . **H2NR18_3**
Partner #3 NR data are in the RX section. . . . . **NRRXW2_3**
1. In what month [and year] did your romantic relationship with . . . . **H2RX1M_3**
{INITIALS} begin?
In what [month and] year did your romantic relationship with . . . . **H2RX1Y_3**
{INITIALS} begin?
2. How old was {INITIALS} when your romantic relationship began? . . . . **H2RX2_3**
3. About how old was {INITIALS}? . . . . **H2RX3_3**
4. What grade was {INITIALS} in at that time? . . . . **H2RX4_3**
5. When your relationship with {INITIALS} began, did you and {INITIALS} . . . . **H2RX5_3**
go to the same school?
6. When your relationship with {INITIALS} began, where did {INITIALS} live? . . . . . **H2RX6_3**
7. In what ways did you know {INITIALS} before your relationship began?
You went to the same school. . . . . **H2RX7A_3**
You went to the same church, synagogue, or place of worship. . . . . **H2RX7B_3**
You were neighbors. . . . . **H2RX7C_3**
You were casual acquaintances. . . . . **H2RX7D_3**
You were friends. . . . . **H2RX7E_3**
{INITIALS} was a friend of another friend of yours. . . . . **H2RX7F_3**

Question Variable Name

some other way . . . . **H2RX7G_3**
You did not know {INITIALS} before your relationship began. . . . .**H2RX7H_3**
8. When your relationship with {INITIALS} began, how many of your . . . . **H2RX8_3**
close friends knew {INITIALS}?
9. Did {INITIALS} call you names, insult you, or treat you disrespectfully . . . . **H2RX9_3**
in front of others?
10. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX10M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX10Y3**
11. Did {INITIALS} swear at you? . . . . **H2RX11_3**
12. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX12M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX12Y3**
13. Did {INITIALS} threaten you with violence? . . . . **H2RX13_3**
14. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX14M3**
If "yes," ask: In what did {INITIALS} first do this? **H2RX14Y3**
15. Did {INITIALS} push or shove you? . . . . **H2RX15_3**
16. *If "yes," ask:* In what month [and year] did {INITIALS} first do this? **H2RX16M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this? **H2RX16Y3**
17. Did {INITIALS} throw something at you that could hurt you? . . . . **H2RX17_3**
18. *If "yes," ask:* I what month [and year] did {INITIALS} first do this? **H2RX18M3**
If "yes," ask: I what [month and] year did {INITIALS} first do this? **H2RX18Y3**
19. Is your romantic relationship with {INITIALS} still going on? . . . . **H2RX19_3**
20. In what month [and year] did your relationship with {INITIALS} end? **H2RX20M3**
In what [month and] year did your relationship with {INITIALS} end? **H2RX20Y3**
21. When the romantic relationship with {INITIALS} ended, where . . . . **H2RX21_3**
did {INITIALS} live?
22. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . . **H2RX22_3**
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?
23. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . **H2RX23_3**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} this past school year?
24. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the . . **H2RX24_3**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
25. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the . . . **H2RX25_3**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} the school year before
this past one?
26. *[If SCHOOL YEAR:]* What grade is {INITIALS} in now? . . . . **H2RX26_3**
[If SUMMER:] What grade was {INITIALS} in during the 1995-1996 school year?
27. How old is {INITIALS} now? . . . . **H2RX27_3**
28. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2RX28_3**
29. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2RX29A3**

Question	Variable Name
Chicano/Chicana	**H2RX29B3**
Cuban/Cuban American	**H2RX29C3**
Puerto Rican	**H2RX29D3**
Central/South American	**H2RX29E3**
other Hispanic	**H2RX29F3**
30. What is {INITIALS}'s race?	
white	**H2RX30A3**
black or African American	**H2RX30B3**
American Indian or Native American	**H2RX30C3**
Asian or Pacific Islander	**H2RX30D3**
other	**H2RX30E3**
31. What is {INITIALS}'s Asian background?	
Chinese	**H2RX31A3**
Filipino	**H2RX31B3**
Japanese	**H2RX31C3**
Asian Indian	**H2RX31D3**
Korean	**H2RX31E3**
Vietnamese	**H2RX31F3**
other	**H2RX31G3**
32. What is {INITIALS}'s sex?	**H2RX32_3**
33. [letters of rejected cards]	
A. You went out together in a group.	**H2RX33A3**
B. You met your partner's parents.	**H2RX33B3**
C. You told other people that you were a couple.	**H2RX33C3**
D. You saw less of other friends so you could spend more time with your partner.	**H2RX33D3**
E. You and your partner went out together alone.	**H2RX33E3**
F. You held hands.	**H2RX33F3**
G. You gave each other presents.	**H2RX33G3**
H. You told each other that you loved each other	**H2RX33H3**
I. You thought of yourselves as a couple.	**H2RX33I3**
J. You talked about contraception or sexually transmitted diseases.	**H2RX33J3**
K. You kissed.	**H2RX33K3**
L. You touched each other under your clothing or with no clothes on.	**H2RX33L3**
M. You had sexual intercourse.	**H2RX33M3**
N. You touched each others' genitals (private parts).	**H2RX33N3**
O. You or your partner got pregnant.	**H2RX33O3**
34. [ordered list of remaining cards]	
Enter the first thing that happened in your relationship with {INITIALS}.	**H2RX34A3**
Enter the next [second] thing that happened in your relationship	**H2RX34B3**
Enter the next [third] thing that happened in your relationship	**H2RX34C3**
Enter the next [fourth] thing that happened in your relationship	**H2RX34D3**
Enter the next [fifth] thing that happened in your relationship	**H2RX34E3**

Question	Variable Name
Enter the next [sixth] thing that happened in your relationship	**H2RX34F3**
Enter the next [seventh] thing that happened in your relationship	**H2RX34G3**
Enter the next [eighth] thing that happened in your relationship	**H2RX34H3**
Enter the next [ninth] thing that happened in your relationship	**H2RX34I3**
Enter the next [tenth] thing that happened in your relationship	**H2RX34J3**
Enter the next [eleventh] thing that happened in your relationship	**H2RX34K3**
Enter the next [twelfth] thing that happened in your relationship	**H2RX34L3**
Enter the next [thirteenth] thing that happened in your relationship	**H2RX34M3**
Enter the next [fourteenth] thing that happened in your relationship	**H2RX34N3**
Enter the next [fifteenth] thing that happened in your relationship	**H2RX34O3**
35. Have you had sexual intercourse with {INITIALS}?	**H2RX35_3**
36. *If R is male*: When you had sexual intercourse with {INITIALS} did you insert your penis into her vagina? *If R is female*: When you had sexual intercourse with {INITIALS} did he insert his penis into your vagina?	**H2RX36_3**
37. In what month [and year] did you first have sexual intercourse with {INITIALS}?	**H2RX37M3**
In what [month and] year did you first have sexual intercourse with {INITIALS}?	**H2RX37Y3**
38. In what month [and year] did you have sexual intercourse with {INITIALS} most recently?	**H2RX38M3**
In what [month and] year did you have sexual intercourse with {INITIALS} most recently?	**H2RX38Y3**
39. Did you and {INITIALS} have intercourse once, or more than once?	**H2RX39_3**
40. Did you or {INITIALS} use any method of birth control?	**H2RX40_3**
41. What method of birth control did you or your partner use?	**H2RX41A3**
What other method of birth control did you or your partner use?	**H2RX41B3**
What other method of birth control did you or your partner use?	**H2RX41C3**
42. Was a condom used when you had sexual intercourse with {INITIALS}?	**H2RX42_3**
43. During that month when you and {INITIALS} had sexual intercourse, did either of you ever use any method of birth control?	**H2RX43_3**
44. Did one or the other of you use some method of birth control every time you and {INITIALS} had intercourse?	**H2RX44_3**
45. What method of birth control did you or your partner use?	**H2RX45A3**
What other method of birth control did you or your partner use?	**H2RX45B3**
What other method of birth control did you or your partner use?	**H2RX45C3**
46. Was a condom ever used when you had sexual intercourse with {INITIALS}?	**H2RX46_3**
47. Did you and {INITIALS} use more than one birth control method at the same time, or did you use these methods at different times?	**H2RX47_3**
48. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had sexual intercourse, did one or the other of you ever use any method of birth control?	**H2RX48_3**
49. Throughout these months, did one or the other of you use some method	**H2RX49_3**

Question Variable Name

of birth control every time you and {INITIALS} had intercourse?
50. What method of birth control did you or your partner use? **H2RX50A3**
What other method of birth control did you or your partner use? **H2RX50B3**
What other method of birth control did you or your partner use? **H2RX50C3**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . . **H2RX51_3**
52. Did you and {INITIALS} use more than one birth control method at the . . . . **H2RX52_3**
same time, or did you use these methods at different times?
53. About how many times have you and {INITIALS} had sexual intercourse . . . . **H2RX53_3**
since {FIRST DATE}?
54. Have you ever had anal intercourse with {INITIALS}? . . . . **H2RX54_3**
55. In what month [and year] did you first have anal intercourse with {INITIALS}? . **H2RX55M3**
In what [month and] year did you first have anal intercourse with {INITIALS}? **H2RX55Y3**
56. *If R is male:* Did you wear a condom the first time you had anal intercourse? . . . . **H2RX56_3**
If R is female: Did he wear a condom the first time you had anal intercourse?
57. In what month [and year] did you have anal intercourse with {INITIALS} **H2RX57M3**
most recently?
In what [month and] year did you have anal intercourse with {INITIALS} **H2RX57Y3**
most recently?
58. *If R is male:* About how many times have you and she had anal intercourse? . . . . **H2RX58_3**
If R is female: About how many times have you and he had anal intercourse?
59. *If R is male:* How often have you used a condom during anal intercourse . . . . **H2RX59_3**
with {INITIALS}?
If R is female: How often has he used a condom during anal intercourse with you?
If male-male relationship, ask Q.60-71.
60. Has {INITIALS} ever inserted his penis into . . . . **H2RX60_3**
your anus?
61. In what month [and year] did he do this with you the first time? **H2RX61M3**
In what [month and] year did he do this with you the first time? **H2RX61Y3**
62. Did he wear a condom the first time he did this with you? . . . .**H2RX62_3**
63. In what month [and year] did he insert his penis into your anus most recently? . . .**H2RX63M3**
In what [month and] year did he insert his penis into your anus most recently? **H2RX63Y3**
64. About how many times has {INITIALS} inserted his penis into your anus? . . . . . . **H2RX64_3**
65. How often did {INITIALS} wear a condom when he did this with you? . . . . **H2RX65_3**
66. Have you ever inserted your penis in {INITIALS}'s anus? . . . . **H2RX66_3**
67. In what month [and year] did you do this with {INITIALS} the first time? **H2RX67M3**
In what [month and] year did you do this with {INITIALS} the first time? **H2RX67Y3**
68. Did you wear a condom the first time you did this with him? . . . . **H2RX68_3**
69. In what month [and year] did you insert your penis into {INITIALS}'s **H2RX69M3**
anus most recently?
In what [month and] year did you insert your penis into {INITIAL}'s **H2RX69Y3**
anus most recently?
70. About how many times have you inserted your penis into his anus? . . . .**H2RX70_3**
71. How often did you wear a condom when you did this with him? . . . . **H2RX71_3**

Question Variable Name

19. How old is {INITIALS}? . . . . **H2NR19_3**
20 *[If SCHOOL YEAR:]* Does {INITIALS} go to {SAMPLE SCHOOL}? . . . . **H2NR20_3**
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} this past school year?
21. *[If SCHOOL YEAR:]* Does {INITIALS} go to {SISTER SCHOOL}? . . . . **H2NR21_3**
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} this past school year?
22. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SAMPLE SCHOOL} during the . . **H2NR22_3**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SAMPLE SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
23. *[If SCHOOL YEAR:]* Did {INITIALS} go to {SISTER SCHOOL} during the . . . .**H2NR23_3**
1994-95 school year, in other words, last school year?
[If SUMMER:] Did {INITIALS} go to {SISTER SCHOOL} during the
1994-95 school year, in other words, the school year before this past one?
24. What is {INITIALS}'s sex? . . . . **H2NR24_3**
25. Is {INITIALS} of Hispanic or Latino origin? . . . . **H2NR25_3**
26. What is {INITIALS}'s Hispanic or Latino background?
Mexican/Mexican American **H2NR26A3**
Chicano/Chicana **H2NR26B3**
Cuban/Cuban American **H2NR26C3**
Puerto Rican **H2NR26D3**
Central/South American **H2NR26E3**
other Hispanic **H2NR26F3**
27. What is {INITIALS}'s race?
white **H2NR27A3**
black or African American **H2NR27B3**
American Indian or Native American **H2NR27C3**
Asian or Pacific Islander **H2NR27D3**
other **H2NR27E3**
28. What is {INITIALS}'s Asian background?
Chinese **H2NR28A3**
Filipino **H2NR28B3**
Japanese **H2NR28C3**
Asian Indian **H2NR28D3**
Korean **H2NR28E3**
Vietnamese **H2NR28F3**
other **H2NR28G3**
29. Before you first had sex with {INITIALS}, in what ways did you know each other?
You went to the same school. . . . . **H2NR29A_3**
You went to the same church, synagogue, or place of worship. . . . .**H2NR29B_3**
You were neighbors. . . . . **H2NR29C_3**
You were casual acquaintances. . . . . **H2NR29D_3**
You were friends. . . . . **H2NR29E_3**
{INITIALS} was a friend of another friend of yours. . . . . **H2NR29F_3**

Question	Variable Name
some other way	**H2NR29G_3**
You did not know {INITIALS} before you had sex.	**H2NR29H_3**
30. When you had sex with {INITIALS} most recently, where did {HE/SHE} live?	**H2NR30_3**
31. Did {INITIALS} call you names, insult you, or treat you disrespectfully in front of others?	**H2NR31_3**
32. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR32M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR32Y3**
33. Did {INITIALS} swear at you?	**H2NR33_3**
34. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR34M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR34Y3**
35. Did {INITIALS} threaten you with violence?	**H2NR35_3**
36. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR36M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR36Y3**
37. Did {INITIALS} push or shove you?	**H2NR37_3**
38. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR38M3**
If "yes," ask: In what did {INITIALS} first do this?	**H2NR38Y3**
39. Did {INITIALS} throw something at you that could hurt you?	**H2NR39_3**
40. *If "yes," ask:* In what month [and year] did {INITIALS} first do this?	**H2NR40M3**
If "yes," ask: In what [month and] year did {INITIALS} first do this?	**H2NR40Y3**
41. Have you had sexual intercourse with {INITIALS}?	**H2NR41_3**
42. In what month [and year] did you first have sexual intercourse with {INITIALS}?	**H2NR42M3**
In what [month and] year did you first have sexual intercourse with {INITIALS}?	**H2NR42Y3**
43. In what month [and year] did you have sexual intercourse with {INITIALS} most recently?	**H2NR43M3**
In what [month and] year did you have sexual intercourse with {INITIALS} most recently?	**H2NR43Y3**
44. Did you and {INITIALS} have intercourse once, or more than once?	**H2NR44_3**
45. Did you or {INITIALS} use any method of birth control?	**H2NR45_3**
46. What method of birth control did you or your partner use?	**H2NR46A3**
What other method of birth control did you or your partner use?	**H2NR46B3**
What other method of birth control did you or your partner use?	**H2NR46C3**
47. Was a condom used when you had sexual intercourse with {INITIALS}?	**H2NR47_3**
48. During that month when you and {INITIALS} had sexual intercourse, did either of you ever use any method of birth control?	**H2NR48_3**
49. Did one or the other of you use some method of birth control every time you and {INITIALS} had intercourse?	**H2NR49_3**
50. What method of birth control did you or your partner use?	**H2NR50A3**
What other method of birth control did you or your partner use?	**H2NR50B3**
What other method of birth control did you or your partner use?	**H2NR50C3**
51. Was a condom ever used when you had sexual intercourse with {INITIALS}?	**H2NR51_3**
52. Did you and {INITIALS} use more than one birth control method at the	**H2NR52_3**

Question Variable Name

same time, or did you use these methods at different times?
53. Between {FIRST DATE} and {LAST DATE}, when you and {INITIALS} had . . **H2NR53_3**
sexual intercourse, did one or the other of you ever use any method of
birth control?
54. Throughout these months, did one or the other of you use some method . . . . **H2NR54_3**
of birth control every time you and {INITIALS} had intercourse?
55. What method of birth control did you or your partner use? **H2NR55A3**
What other method of birth control did you or your partner use? **H2NR55B3**
What other method of birth control did you or your partner use? **H2NR55C3**
56. Was a condom ever used when you had sexual intercourse with {INITIALS}? . . . **H2NR56_3**
57. Did you and {INITIALS} use more than one birth control method at the . . . . **H2NR57_3**
same time, or did you use these methods at different times?
58. About how many times have you and {INITIALS} had sexual intercourse . . . . . . **H2NR58_3**
since {FIRST DATE}?
59. Have you ever had anal intercourse with {INITIALS}? . . . . **H2NR59_3**
60. In what month [and year] did you first have anal intercourse with {INITIALS}? . **H2NR60M3**
In what [month and] year did you first have anal intercourse with {INITIALS}? **H2NR60Y3**
61. *If R is male:* Did you wear a condom the first time you had anal intercourse? . . . . **H2NR61_3**
If R is female: Did he wear a condom the first time you had anal intercourse?
62. In what month [and year] did you have anal intercourse with {INITIALS} **H2NR62M3**
most recently?
In what [month and] year did you have anal intercourse with {INITIALS} **H2NR62Y3**
most recently?
63. *If R is male:* About how many times have you and she had anal intercourse? . . . . **H2NR63_3**
If R is female: About how many times have you and he had anal intercourse?
64. *If R is male:* How often have you used a condom during anal intercourse . . . . **H2NR64_3**
with {INITIALS}?
If R is female: How often has he used a condom during anal intercourse with you?
If male-male relationship, ask Q.65-76.
65. Has {INITIALS} ever inserted his penis into . . . . **H2NR65_3**
your anus?
66. In what month [and year] did he do this with you the first time? **H2NR66M3**
In what [month and] year did he do this with you the first time? **H2NR66Y3**
67. Did he wear a condom the first time he did this with you? . . . .**H2NR67_3**
68. In what month [and year] did he insert his penis into your anus most recently? . . .**H2NR68M3**
In what [month and] year did he insert his penis into your anus most recently? **H2NR68Y3**
69. About how many times has {INITIALS} inserted his penis into your anus? . . . . . . **H2NR69_3**
70. How often did {INITIALS} wear a condom when he did this with you? . . . . **H2NR70_3**
71. Have you ever inserted your penis into {INITIALS}'s anus? . . . . **H2NR71_3**
72. In what month [and year] did you do this with {INITIALS} the first time? **H2NR72M3**
In what [month and] year did you do this with {INITIALS} the first time? **H2NR72Y3**
73. Did you wear a condom the first time you did this with him? . . . . **H2NR73_3**
74. In what month [and year] did you insert your penis into {INITIALS}'s **H2NR74M3**

Question Variable Name

anus most recently?
In what [month and] year did you insert your penis into {INITIAL}'s **H2NR74Y3**
anus most recently?
75. About how many times have you inserted your penis into his anus? . . . . **H2NR75_3**
76. How often did you wear a condom when you did this with him? . . . . **H2NR76_3**
77. Did you ever give {INITIALS} sex in exchange for drugs or money? . . . . **H2NR77_3**
78. How many times did you give {INITIALS} sex in exchange for drugs or money? . **H2NR78_3**
79. In addition to {INITIALS, INITIALS, INITIALS}, and anyone whose initials you . .**H2NR79**
gave as a romantic partner, have you had a sexual relationship with anyone else
since {MOLI}?
80. With how many other people? **H2NR80**
81. What is that person's age? **H2NR81**
82. What is that person's sex? **H2NR82**
83. How often has a condom been used when you have had sex with this person? . . . **H2NR83**
84. Did you ever give this person sex in exchange for drugs or money? **H2NR84**
85. What is the age of the youngest of these others? **H2NR85**
86. What is the age of the oldest of these others? **H2NR86**
87. With these other partners, how often would you say that you or your partner **H2NR87**
used a condom?
88. Are these other partners male or female? **H2NR88**

Section 26: Motivations for Birth Control—Audio CASI

How much do you agree or disagree with each of the following statements?
1. In general, birth control is too much of a hassle to use. **H2BC1**
2. In general, birth control is too expensive to buy. **H2BC2**
3. It takes too much planning ahead of time to have birth control on hand **H2BC3**
when you're going to have sex.
4. It {IS/WOULD BE} too hard to get a {GIRL/BOY} to use birth control with you. . . **H2BC4**
5. For you, using birth control {INTERFERES/WOULD INTERFERE} with **H2BC5**
sexual enjoyment.
6. It {IS/WOULD BE} easy for you to get birth control. **H2BC6**
7. Using birth control is morally wrong. **H2BC7**
8. If you used birth control, your friends might think that you were looking **H2BC8**
for sex.

Section 27: Tobacco, Alcohol, Drugs—Audio CASI

1. Since {MOLI}, have you ever tried cigarette smoking, even just 1 or 2 puffs? **H2TO1**
3. Since {MOLI}, have you ever smoked cigarettes regularly, that is, at least **H2TO3**
1 cigarette every day for 30 days?
4. Since {MOLI}, in what month [and year] did you first smoke cigarettes **H2TO4M**
regularly, that is, smoke at least one cigarette every day for 30 days?
Since {MOLI}, in what [month and] year did you first smoke cigarettes **H2TO4Y**
regularly, that is, smoke at least one cigarette every day for 30 days?

Question	Variable Name
5. During the past 30 days, on how many days did you smoke cigarettes?	**H2TO5**
6. In what month [and year] did you quit smoking cigarettes?	**H2TO6M**
In what [month and] year did you quit smoking cigarettes?	**H2TO6Y**
7. During the past 30 days, on the days you smoked, how many cigarettes did you smoke each day?	**H2TO7**
8. When was the most recent day you smoked one or more cigarettes?	**H2TO8**
9. During the past 6 months, have you tried to quit smoking cigarettes?	**H2TO9**
10. Of your 3 best friends, how many smoke at least 1 cigarette a day?	**H2TO10**
11. Are cigarettes easily available to you in your home?	**H2TO11**
12. During the past 30 days, on how many days did you use chewing tobacco (such as Redman, Levi Garrett, or Beechnut) or snuff (such as Skoal, Skoal Bandits, or Copenhagen)?	**H2TO12**
14. When was the most recent day you used chewing tobacco or snuff?	**H2TO14**
15. Since {MOLI}, have you had a drink of beer, wine, or liquor—not just a sip or taste of someone else's drink—more than 2 or 3 times?	**H2TO15**
16. Since {MOLI}, did you drink beer, wine, or liquor when you were not with your parents or other adults in your family?	**H2TO16**
18. Since {MOLI}, in what month [and year] did you first have a drink of beer, wine, or liquor when you were not with your parents or other adults in your family?	**H2TO18M**
Since {MOLI}, in what [month and] year did you first have a drink of beer, wine, or liquor when you were not with your parents or other adults in your family?	**H2TO18Y**
19. During the past 12 months, on how many days did you drink alcohol?	**H2TO19**
20. Think of all the times you have had a drink during the past 12 months. How many drinks did you usually have each time?	**H2TO20**
21. Over the past 12 months, on how many days did you drink five or more drinks in a row?	**H2TO21**
22. Over the past 12 months, on how many days have you gotten drunk or "very, very high" on alcohol?	**H2TO22**
23. Which do you drink most often—beer, wine, wine coolers, straight liquor, or mixed drinks?	**H2TO23**
24. When was the most recent time you drank alcohol- beer, wine, wine cooler, or hard liquor?	**H2TO24**
Over the past 12 months, how many times has each of the following things happened?	
25. You got into trouble with your parents because you had been drinking.	**H2TO25**
26. You had problems at school or with school work because you had been drinking.	**H2TO26**
27. You had problems with your friends because you had been drinking.	**H2TO27**
28. You had problems with someone you were dating because you had been drinking.	**H2TO28**
29. You did something you later regretted because you had been drinking.	**H2TO29**
Over the past 12 months, how many times...	
30. were you hung over?	**H2TO30**

Question	Variable Name
31. were you sick to your stomach or threw up after drinking?	**H2TO31**
32. did you get into a sexual situation that you later regretted because you had been drinking?	**H2TO32**
33. did you get into a physical fight because you had been drinking?	**H2TO33**
34. The most recent time you got into a fight, had you been drinking?	**H2TO34**
35. Were you drunk?	**H2TO35**
36. Since {MOLI}, have you driven while drunk?	**H2TO36**
37. During the past 30 days, how often did you drive a car or other vehicle when you had been drinking alcohol?	**H2TO37**
Since {MOLI}, have you...	
38. been drunk at school?	**H2TO38**
39. drunk alcohol while you were alone?	**H2TO39**
40. The most recent time you drank alcohol, were you alone?	**H2TO40**
41. Of your 3 best friends, how many drink alcohol at least once a month?	**H2TO41**
42. Is alcohol easily available to you in your home?	**H2TO42**
44. Since {MOLI}, have you tried or used marijuana?	**H2TO44**
45. Since {MOLI}, how many times have you tried or used marijuana?	**H2TO45**
46. During the past 30 days, how many times have you used marijuana?	**H2TO46**
47. When was the most recent time you used marijuana?	**H2TO47**
48. Of your 3 best friends, how many use marijuana at least once a month?	**H2TO48**
50. Since {MOLI}, how many times have you tried or used any kind of cocaine?	**H2TO50**
51. Since {MOLI}, how many times have you used cocaine?	**H2TO51**
52. During the past 30 days, how many times have you used cocaine?	**H2TO52**
54. Since {MOLI}, how many times have you tried or used inhalants, such as glue or solvents?	**H2TO54**
55. Since {MOLI}, how many times have you used inhalants?	**H2TO55**
56. During the past 30 days, how many times have you used inhalants?	**H2TO56**
58. Since {MOLI}, have you tried any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, or pills, without a doctor's prescription?	**H2TO58**
59. Since {MOLI}, how many times have you used any of these types of illegal drugs?	**H2TO59**
60. During the past 30 days, how many times did you use any of these types of illegal drugs?	**H2TO60**
61. Since {MOLI}, have you injected (shot up with a needle) any illegal drug, such as heroin, or cocaine?	**H2TO61**
62. Since {MOLI}, how often have you taken such a drug using a needle?	**H2TO62**
64. During the past 30 days, how often did you take an illegal drug using a needle?	**H2TO64**
65. Do you own your own needle and syringe (or works)?	**H2TO65**
66. Have you ever shared a needle and syringe with another person?	**H2TO66**
67. Do you always bleach the needle and syringe you are using before you use them?	**H2TO67**

Question	Variable Name
68. Are illegal drugs easily available to you in your home?	**H2TO68**

Section 28: Delinquency Scale—Audio CASI

In the past 12 months, how often did you ...

1. paint graffiti or signs on someone else's property or in a public place? **H2DS1**
2. deliberately damage property that didn't belong to you? **H2DS2**
3. lie to your parents or guardians about where you had been or whom you were with? **H2DS3**
4. take something from a store without paying for it? **H2DS4**
5. run away from home? **H2DS5**
6. drive a car without its owner's permission? **H2DS6**
7. steal something worth more than $50? **H2DS7**
8. go into a house or building to steal something? **H2DS8**
9. use or threaten to use a weapon to get something from someone? **H2DS9**
10. sell marijuana or other drugs? **H2DS10**
11. steal something worth less than $50? **H2DS11**
12. act loud, rowdy, or unruly in a public place? **H2DS12**
13. take part in a fight where a group of your friends was against another group? **H2DS13**
14. Have you been initiated into a named gang? **H2DS14**

Section 29: Fighting and Violence—Audio CASI

During the past 12 months, how often did each of the following things happen?

1. You saw someone shoot or stab another person. **H2FV1**
2. Someone pulled a knife or gun on you. **H2FV2**
3. Someone shot you. **H2FV3**
4. Someone cut or stabbed you. **H2FV4**
5. You were jumped. **H2FV5**
6. You pulled a knife or gun on someone. **H2FV6**
7. You shot or stabbed someone. **H2FV7**

Since {MOLI}, have you...

8. drunk alcohol while carrying a weapon, such as a gun, knife, or club? **H2FV8**
9. used drugs while carrying a weapon, such as a gun, knife, or club? **H2FV9**
10. used a weapon in a fight? **H2FV10**
11. carried a weapon at school? **H2FV11**
12. During the past 30 days, on how many days did you carry a weapon-such as a gun, knife, or club- to school? **H2FV12**
13. During the past 30 days, what one kind of weapon did you carry most often? **H2FV13**
14. Is a gun easily available to you in your home? **H2FV14**
15. What kind of gun is available?

handgun **H2FV15A**
shotgun **H2FV15B**
rifle **H2FV15C**
some other kind **H2FV15D**

Question — Variable Name

16. In the past 12 months, how often did you get into a serious physical fight? **H2FV16**
17. In the past 12 months, how often did you use a weapon in a fight? **H2FV17**
18. The last time you were in a physical fight, with whom did you fight? **H2FV18**
19. The last time you were in a physical fight, where did it occur? **H2FV19**
20. In the past 12 months, how many times were you in a physical fight in . . . . **H2FV20** which you were injured and had to be treated by a doctor or nurse?
21. In what month [and year] were you most recently injured in a physical . . . . **H2FV21M** fight badly enough that you had to be treated by a doctor or nurse?
In what [month and] year were you most recently injured in a physical . . . . **H2FV21Y** fight badly enough that you had to be treated by a doctor or nurse?
22. In the past 12 months, how often did you hurt someone badly enough to need . . . **H2FV22** bandages or care from a doctor or nurse?

Section 30: Joint Occurrences—Audio CASI

1. The first time you had sexual intercourse, had you been drinking alcohol? **H2JO1**
2. Were you drunk when you had sexual intercourse for the first time? **H2JO2**
3. The most recent time you had sexual intercourse, had you been drinking alcohol? . . **H2JO3**
4. Were you drunk when you had sexual intercourse most recently? **H2JO4**
5. The first time you had sexual intercourse, had you been using drugs? **H2JO5**
6. What kind of drugs had you been using?
marijuana **H2JO6A**
crack cocaine **H2JO6B**
other types of cocaine, including freebase or powder **H2JO6C**
inhalants, including glue or solvents **H2JO6D**
other illegal drugs **H2JO6E**
7. The most recent time you had sexual intercourse, had you been using drugs? **H2JO7**
8. What kind of drugs had you been using?
marijuana **H2JO8A**
crack cocaine **H2JO8B**
other types of cocaine, including freebase or powder **H2JO8C**
inhalants, including glue or solvents **H2JO8D**
other illegal drugs **H2JO8E**
9. Since {MOLI}, have you drunk alcohol when you were using drugs? **H2JO9**
10. The most recent time you drank alcohol when you were using drugs, what kind of drugs were you using?
marijuana **H2JO10A**
crack cocaine **H2JO10B**
other types of cocaine, including freebase or powder **H2JO10C**
inhalants, including glue or solvents **H2JO10D**
other illegal drugs **H2JO10E**
Since {MOLI}, have you...
11. driven while high on drugs? **H2JO11**
12. been high on drugs at school? **H2JO12**

Question Variable Name

13. gotten into a fight when you had been using drugs? **H2JO13**
14. The most recent time you got into a fight when you had been using drugs, what kind of drugs had you been using?

marijuana **H2JO14A**
crack cocaine **H2JO14B**
other types of cocaine, including freebase or powder **H2JO14C**
inhalants, including glue or solvents **H2JO14D**
other illegal drugs **H2JO14E**

16. Since {MOLI}, have you ever used drugs while you were alone? **H2JO16**

Section 31A: Male Physical Development—Audio CASI

1. How much hair is under your arms now? **H2MP1**
2. How thick is the hair on your face? **H2MP2**
3. Is your voice lower now than it was when you were in grade school? **H2MP3**
4. How advanced is your physical development compared to other boys your age? . . . **H2MP4**

Section 31B: Female Physical Development and Pregnancy History—Audio CASI

1. As a girl grows up her breasts develop and get bigger. Which sentence best . . . . **H2FP1** describes you?
2. As a girl grows up her body becomes more curved. Which sentence best . . . .**H2FP2** describes you?
3. Have you ever had a menstrual period or menstruated? **H2FP3**
4. How old were you when you had your very first menstrual period? **H2FP4**
5. On what month [and day] did your most recent period begin? **H2FP5M**

On what [month and] day did your most recent period begin? **H2FP5D**

6. Did you have cramps during you most recent period? **H2FP6**
7. On how many days did you have cramps? **H2FP7**
8. Did you take medication for the cramps? **H2FP8**
9. How advanced is your physical development compared to other girls your age? **H2FP9**
10. Have you ever been pregnant? **H2FP10**
11. How many times have you been pregnant? **H2FP11**
12. In what month [and year] did your most recent pregnancy begin? **H2FP12M**

In what [month and] year did your most recent pregnancy begin? **H2FP12Y**

14. Between January 1, 1994, and {MONTH/YEAR (from Q.12)},did you have . . . . . .**H2FP14_1** any other pregnancies?
15. In what month [and year] did you get pregnant most recently between . . . .**H2FP12M2** January 1, 1994, and {MONTH/YEAR (from Q.12)}?

In what month [and year] did you get pregnant most recently between . . . . **H2FP12Y2** January 1, 1994, and {MONTH/YEAR (from Q.12)}?

14. Between January 1, 1994, and {MONTH/YEAR (from Q.15)},did you have . . . . **H2FP14_2** any other pregnancies?
15. In what month [and year] did you get pregnant most recently between . . . . **H2FP12M3** January 1, 1994, and {MONTH/YEAR (from Q.15)}?

Question	Variable Name
In what month [and year] did you get pregnant most recently between January 1, 1994, and {MONTH/YEAR (from Q.15)}?	**H2FP12Y3**
14. Between January 1, 1994, and {MONTH/YEAR (from Q.15)}, did you have any other pregnancies?	**H2FP14_3**
First Pregnancy	
16. During {MONTH, YEAR} when you got pregnant, were you or your partner using any kind of birth control methods?	**H2FP16_1**
17. What method of birth control did you or your partner use?	**H2FP17A1**
What other method of birth control did you or your partner use?	**H2FP17B1**
What other method of birth control did you or your partner use?	**H2FP17C1**
18. Did you or your partner use {THIS METHOD/AT LEAST ONE METHOD OF BIRTH CONTROL} every time you and he had sexual intercourse that month?	**H2FP18_1**
19. Before you got pregnant, did you want to get pregnant by your partner at that time?	**H2FP19_1**
20. At the time you got pregnant, were you and he married to each other?	**H2FP20_1**
21. Did you want to marry him?	**H2FP21_1**
22. Did you marry him?	**H2FP22_1**
23. When did you marry him, in relation to your pregnancy?	**H2FP23_1**
24. In what month [and year] did this pregnancy end?	**H2FP24M1**
In what [month and] year did this pregnancy end?	**H2FP24Y1**
25. How did this pregnancy end?	**H2FP25_1**
26. Did you have twins?	**H6FP26_1**
27. Was the {CHILD/FIRST TWIN} placed for legal adoption?	**H2FP27A1**
28. Is the {CHILD/FIRST TWIN} still living?	**H2FP28A1**
29. In what month [and year] did the {CHILD/FIRST TWIN/SECOND TWIN} die?	**H2F29MA1**
In what [month and] year did the {CHILD/FIRST TWIN/SECOND TWIN} die?	**H2F29YA1**
30. Does the {CHILD/FIRST TWIN/SECOND TWIN} live with you?	**H2FP30A1**
31. How often do you visit with the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP31A1**
32. With whom does the {CHILD/FIRST TWIN/SECOND TWIN} live?	**H2FP32A1**
33. Does the {CHILD/FIRST TWIN/SECOND TWIN}'s father live with you?	**H2FP33A1**
34. How often does the father visit with the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP34A1**
35. Do you have a legal agreement with the father regarding custody of the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP35A1**
36. Do you have a legal agreement with the father regarding visitation with the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP36A1**
37. Do you have a legal agreement with the father regarding payment of child support for the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP37A1**
38. In a typical month, how much support does the father pay for the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP38A1**

Question	Variable Name
Second Pregnancy	
16. During {MONTH, YEAR} when you got pregnant, were you or your partner using any kind of birth control methods?	**H2FP16_2**
17. What method of birth control did you or your partner use?	**H2FP17A2**
What other method of birth control did you or your partner use?	**H2FP17B2**
What other method of birth control did you or your partner use?	**H2FP17C2**
18. Did you or your partner use {THIS METHOD/AT LEAST ONE METHOD OF BIRTH CONTROL} every time you and he had sexual intercourse that month?	**H2FP18_2**
19. Before you got pregnant, did you want to get pregnant by your partner at that time?	**H2FP19_2**
20. At the time you got pregnant, were you and he married to each other?	**H2FP20_2**
21. Did you want to marry him?	**H2FP21_2**
22. Did you marry him?	**H2FP22_2**
23. When did you marry him, in relation to your pregnancy?	**H2FP23_2**
24. In what month [and year] did this pregnancy end?	**H2FP24M2**
In what [month and] year did this pregnancy end?	**H2FP24Y2**
25. How did this pregnancy end?	**H2FP25_2**
26. Did you have twins?	**H6FP26_2**
27. Was the {CHILD/FIRST TWIN} placed for legal adoption?	**H2FP27A2**
28. Is the {CHILD/FIRST TWIN} still living?	**H2FP28A2**
29. In what month [and year] did the {CHILD/FIRST TWIN/SECOND TWIN} die?	**H2F29MA2**
In what [month and] year did the {CHILD/FIRST TWIN/SECOND TWIN} die?	**H2F29YA2**
30. Does the {CHILD/FIRST TWIN/SECOND TWIN} live with you?	**H2FP30A2**
31. How often do you visit with the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP31A2**
32. With whom does the {CHILD/FIRST TWIN/SECOND TWIN} live?	**H2FP32A2**
33. Does the {CHILD/FIRST TWIN/SECOND TWIN}'s father live with you?	**H2FP33A2**
34. How often does the father visit with the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP34A2**
35. Do you have a legal agreement with the father regarding custody of the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP35A2**
36. Do you have a legal agreement with the father regarding visitation with the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP36A2**
37. Do you have a legal agreement with the father regarding payment of child support for the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP37A2**
38. In a typical month, how much support does the father pay for the {CHILD/FIRST TWIN/SECOND TWIN}?	**H2FP38A2**
Third Pregnancy	
16. During {MONTH, YEAR} when you got pregnant, were you or your partner using any kind of birth control methods?	**H2FP16_3**
17. What method of birth control did you or your partner use?	**H2FP17A3**

Question Variable Name

What other method of birth control did you or your partner use? **H2FP17B3**
What other method of birth control did you or your partner use? **H2FP17C3**
18. Did you or your partner use {THIS METHOD/AT LEAST ONE METHOD . . . . **H2FP18_3**
OF BIRTH CONTROL} every time you and he had sexual intercourse
that month?
19. Before you got pregnant, did you want to get pregnant by your partner . . . . **H2FP19_3**
at that time?
20. At the time you got pregnant, were you and he married to each other? . . . . **H2FP20_3**
21. Did you want to marry him? . . . . **H2FP21_3**
22. Did you marry him? . . . . **H2FP22_3**
23. When did you marry him, in relation to your pregnancy? . . . .**H2FP23_3**
24. In what month [and year] did this pregnancy end? **H2FP24M3**
In what [month and] year did this pregnancy end? **H2FP24Y3**
25. How did this pregnancy end? . . . .**H2FP25_3**
26. Did you have twins? . . . . **H6FP26_3**
27. Was the {CHILD/FIRST TWIN} placed for legal adoption? **H2FP27A3**
28. Is the {CHILD/FIRST TWIN} still living? **H2FP28A3**
29. In what month [and year] did the {CHILD/FIRST TWIN/SECOND **H2F29MA3**
TWIN} die?
In what [month and] year did the {CHILD/FIRST TWIN/SECOND **H2F29YA3**
TWIN} die?
30. Does the {CHILD/FIRST TWIN/SECOND TWIN} live with you? **H2FP30A3**
31. How often do you visit with the {CHILD/FIRST TWIN/SECOND TWIN}? **H2FP31A3**
32. With whom does the {CHILD/FIRST TWIN/SECOND TWIN} live? **H2FP32A3**
33. Does the {CHILD/FIRST TWIN/SECOND TWIN}'s father live with you? **H2FP33A3**
34. How often does the father visit with the {CHILD/FIRST TWIN/SECOND **H2FP34A3**
TWIN}?
35. Do you have a legal agreement with the father regarding custody of the **H2FP35A3**
{CHILD/FIRST TWIN/SECOND TWIN}?
36. Do you have a legal agreement with the father regarding visitation with **H2FP36A3**
the {CHILD/FIRST TWIN/SECOND TWIN}?
37. Do you have a legal agreement with the father regarding payment of **H2FP37A3**
child support for the {CHILD/FIRST TWIN/SECOND TWIN}?
38. In a typical month, how much support does the father pay for the **H2FP38A3**
{CHILD/FIRST TWIN/SECOND TWIN}?

Section 32: Suicide—Audio CASI

1. During the past 12 months, did you ever seriously think about **H2SU1**
committing suicide?
2. During the past 12 months, how many times did you actually attempt suicide? **H2SU2**
3. Did any attempt result in an injury, poisoning, or overdose that had to be **H2SU3**
treated by a doctor or nurse?
4. Have any of your friends tried to kill themselves during the past 12 months? **H2SU4**

Question	Variable Name
5. Have any of them succeeded?	**H2SU5**
6. Have any of your family members tried to kill themselves during the past 12 months?	**H2SU6**
7. Have any of them succeeded?	**H2SU7**
8. Generally, for the parts of this interview that you have answered by yourself using the computer- without help from the interviewer- how honestly have you answered the questions?	**H2SU8**
9. For the parts of this interview that you have answered by yourself using the computer, how often did you listen to the questions with the headphones?	**H2SU9**

Section 33: Parents' Attitudes

If RESMOM, ask Q.1-3.

1. How would she feel about your having sex at this time in your life?	**H2PA1**
2. How would she feel about your having sexual intercourse with someone who was special to you and whom you knew well—like a steady {GIRLFRIEND/BOYFRIEND}?	**H2PA2**
3. How would she feel about your using birth control at this time in your life?	**H2PA3**

If RESDAD, ask Q.4-6.

4. How would he feel about your having sex at this time in your life?	**H2PA4**
5. How would he feel about your having sexual intercourse with someone who was special to you and whom you knew well—like a steady {GIRLFRIEND/BOYFRIEND}?	**H2PA5**
6. How would he feel about your using birth control at this time in your life?	**H2PA6**
7. Regardless of whether you have ever had a child, would you consider having a child in the future as an unmarried person?	**H2PA7**

Section 34: Protective Factors

1. How much do you feel that adults care about you?	**H2PR1**
2. How much do you feel that your teachers care about you?	**H2PR2**
3. How much do you feel that your parents care about you?	**H2PR3**
4. How much do you feel that your friends care about you?	**H2PR4**
5. How much do you feel that people in your family understand you?	**H2PR5**
6. How much do you feel that you want to leave home?	**H2PR6**
7. How much do you feel that you and your family have fun together?	**H2PR7**
8. How much do you feel that your family pays attention to you?	**H2PR8**

Section 35: Neighborhood

1. You know most of the people in your neighborhood.	**H2NB1**
2. In the past month, you have stopped on the street to talk with someone who lives in your neighborhood.	**H2NB2**
3. People in this neighborhood look out for each other.	**H2NB3**
4. Do you use a physical fitness or recreation center in your neighborhood?	**H2NB4**
5. Do you usually feel safe in your neighborhood?	**H2NB5**

Question | Variable Name

6. On the whole, how happy are you with living in your neighborhood? **H2NB6**
7. If, for any reason, you had to move from here to some other neighborhood, ... **H2NB7**
how happy or unhappy would you be?
8. Have you lived here since {MOLI}? **H2NB8**
9. How many months have you lived here? **H2NB9**
10. How many times have you moved since {MOLI}? **H2NB10**

Section 36: Religion
1. What is your religion? **H2RE1**
2. Do you agree or disagree that the sacred scriptures of your religion **H2RE2**
are the word of God and are completely without any mistakes?
3. In the past 12 months, how often did you attend religious services? **H2RE3**
4. How important is religion to you? **H2RE4**
5. Do you think of yourself as a Born-Again Christian? **H2RE5**
6. How often do you pray? **H2RE6**
7. Many churches, synagogues, and other places of worship have special **H2RE7**
activities for teenagers—such as youth groups, Bible classes, or choir.
In the past 12 months, how often did you attend such youth activities?

Section 37: Expectations, Employment, Income
1. On a scale of 1 to 5, where 1 is low and 5 is high, how much do you want **H2EE1**
to go to college?
2. On a scale of 1 to 5, where 1 is low and 5 is high, how likely is it that you **H2EE2**
will go to college?
3. In the last 4 weeks, did you work—for pay—for anyone outside your home? **H2EE3**
4. How many hours do you spend working for pay in a typical non-summer week? **H2EE4**
5. How much money do you earn in a typical non-summer week from all **H2EE5**
your jobs combined?
6. How many hours do you spend working for pay in a typical summer week? **H2EE6**
7. How much money do you earn in a typical summer week from all your **H2EE7**
jobs combined?
8. How much is your allowance each week? **H2EE8**
9. Have you ever driven a car? **H2EE9**
10. Do you have a valid driver's license (not a driver's permit)? **H2EE10**
11. About how many miles do you drive each week? **H2EE11**
What do you think are the chances that each of the following things will happen to you?
12. You will live to age 35. . . . . **H2EE12**
13. You will be married by age 25. . . . . **H2EE13**
14. You will be killed by age 21. . . . . **H2EE14**
15. You will get HIV or AIDS. **H2EE15**
16. You will graduate from college. **H2EE16**
17. You will have a middle-class family income by age 30. . . . . **H2EE17**

Question Variable Name

Section 38: Relations with Siblings

First Sibling

Is {NAME} a study sib? **H2SIBA**
Is {NAME} R's twin? **H2TWINA**
1. How much time do you and {NAME} spend together? **H2WS1A**
2. How much time do you and {NAME} spend with the same friend or **H2WS2A**
group of friends?
3. How often do you and {NAME} quarrel or fight? **H2WS3A**
4. How often do you feel love for {NAME}? **H2WS4A**
5. Do you think that you or {NAME} receive more attention and love from **H2WS5A**
your parents?
6. How much do you and {NAME} look alike? **H2WS6A**
7. Are you and {NAME} identical twins or fraternal twins? **H2WS7A**
8.
When you were young children, did you and {NAME} look very much alike, ... **H2WS8A**
like two peas in a pod, or did you just look like members of the same family?
9. Are strangers ever confused about which of you is which? **H2WS9A**
10. Are your teachers ever confused? **H2WS10A**
11. Are family members ever confused? **H2WS11A**
12. How similar are you in personality to {NAME}? **H2WS12A**

Second Sibling

Is {NAME} a study sib? **H2SIBB**
Is {NAME} R's twin? **H2TWINB**
1. How much time do you and {NAME} spend together? **H2WS1B**
2. How much time do you and {NAME} spend with the same friend or group **H2WS2B**
of friends?
3. How often do you and {NAME} quarrel or fight? **H2WS3B**
4. How often do you feel love for {NAME}? **H2WS4B**
5. Do you think that you or {NAME} receive more attention and love from **H2WS5B**
your parents?
6. How much do you and {NAME} look alike? **H2WS6B**
7. Are you and {NAME} identical twins or fraternal twins? **H2WS7B**
8. When you were young children, did you and {NAME} look very much alike, ... **H2WS8B**
9. Are strangers ever confused about which of you is which? **H2WS9B**
11. Are family members ever confused? **H2WS11B**
12. How similar are you in personality to {NAME}? **H2WS12B**

Third Sibling

Is {NAME} a study sib? **H2SIBC**
Is {NAME} R's twin? **H2TWINC**
1. How much time do you and {NAME} spend together? **H2WS1C**

Question Variable Name

2. How much time do you and {NAME} spend with the same friend or group of friends? **H2WS2C**
3. How often do you and {NAME} quarrel or fight? **H2WS3C**
4. How often do you feel love for {NAME}? **H2WS4C**
5. Do you think that you or {NAME} receive more attention and love from your parents? **H2WS5C**
6. How much do you and {NAME} look alike? **H2WS6C**
7. Are you and {NAME} identical twins or fraternal twins? **H2WS7C**
8. When you were young children, did you and {NAME} look very much alike, like two peas in a pod, or did you just look like members of the same family? **H2WS8C**
9. Are strangers ever confused about which of you is which? **H2WS9C**
10. Are your teachers ever confused? **H2WS10C**
11. Are family members ever confused? **H2WS11C**
12. How similar are you in personality to {NAME}? **H2WS12C**

Fourth Sibling

Is {NAME} a study sib? **H2SIBD**
Is {NAME} R’s twin? **H2TWIND**
1. How much time do you and {NAME} spend together? **H2WS1D**
2. How much time do you and {NAME} spend with the same friend or group of friends? **H2WS2D**
3. How often do you and {NAME} quarrel or fight? **H2WS3D**
4. How often do you feel love for {NAME}? **H2WS4D**
5. Do you think that you or {NAME} receive more attention and love from your parents? **H2WS5D**
6. How much do you and {NAME} look alike? **H2WS6D**
7. Are you and {NAME} identical twins or fraternal twins? **H2WS7D**
8. When you were young children, did you and {NAME} look very much alike, like two peas in a pod, or did you just look like members of the same family? **H2WS8D**
9. Are strangers ever confused about which of you is which? **H2WS9D**
10. Are your teachers ever confused? **H2WS10D**
11. Are family members ever confused? **H2WS11D**
12. How similar are you in personality to {NAME}? **H2WS12D**

Fifth sibling

Is {NAME} a study sib? **H2SIBE**
Is {NAME} R’s twin? **H2TWINE**
1. How much time do you and {NAME} spend together? **H2WS1E**
2. How much time do you and {NAME} spend with the same friend or group of friends? **H2WS2E**
3. How often do you and {NAME} quarrel or fight? **H2WS3E**
4. How often do you feel love for {NAME}? **H2WS4E**
5. Do you think that you or {NAME} receive more attention and love from **H2WS5E**

Question	Variable Name
your parents?	
6. How much do you and {NAME} look alike?	**H2WS6E**
7. Are you and {NAME} identical twins or fraternal twins?	**H2WS7E**
8. When you were young children, did you and {NAME} look very much alike, like two peas in a pod, or did you just look like members of the same family?	**H2WS8E**
9. Are strangers ever confused about which of you is which?	**H2WS9E**
10. Are your teachers ever confused?	**H2WS10E**
11. Are family members ever confused?	**H2WS11E**
12. How similar are you in personality to {NAME}?	**H2WS12E**
Sixth Sibling	
Is {NAME} a study sib?	**H2SIBF**
Is {NAME} R's twin?	**H2TWINF**
1. How much time do you and {NAME} spend together?	**H2WS1F**
2. How much time do you and {NAME} spend with the same friend or group of friends?	**H2WS2F**
3. How often do you and {NAME} quarrel or fight?	**H2WS3F**
4. How often do you feel love for {NAME}?	**H2WS4F**
5. Do you think that you or {NAME} receive more attention and love from your parents?	**H2WS5F**
6. How much do you and {NAME} look alike?	**H2WS6F**
7. Are you and {NAME} identical twins or fraternal twins?	**H2WS7F**
8. When you were young children, did you and {NAME} look very much alike, like two peas in a pod, or did you just look like members of the same family?	**H2WS8F**
9. Are strangers ever confused about which of you is which?	**H2WS9F**
10. Are your teachers ever confused?	**H2WS10F**
11. Are family members ever confused?	**H2WS11F**
12. How similar are you in personality to {NAME}?	**H2WS12F**
Seventh Sibling	
Is {NAME} a study sib?	**H2SIBG**
Is {NAME} R's twin?	**H2TWING**
1. How much time do you and {NAME} spend together?	**H2WS1G**
2. How much time do you and {NAME} spend with the same friend or group of friends?	**H2WS2G**
3. How often do you and {NAME} quarrel or fight?	**H2WS3G**
4. How often do you feel love for {NAME}?	**H2WS4G**
5. Do you think that you or {NAME} receive more attention and love from your parents?	**H2WS5G**
6. How much do you and {NAME} look alike?	**H2WS6G**
7. Are you and {NAME} identical twins or fraternal twins?	**H2WS7G**
8. When you were young children, did you and {NAME} look very much alike, like two peas in a pod, or did you just look like members of the same family?	**H2WS8G**

Question	Variable Name
9. Are strangers ever confused about which of you is which?	**H2WS9G**
10. Are your teachers ever confused?	**H2WS10G**
11. Are family members ever confused?	**H2WS11G**
12. How similar are you in personality to {NAME}?	**H2WS12G**
16. Record respondent's height [and weight]	**H2WS16HF**
	H2WS16HI
	H2WS16W
17. Now that you have completed the interview, do you think research like this is worthwhile?	**H2WS17**

Section 39: Interviewer Remarks

Question	Variable Name
1. How physically attractive is the respondent?	**H2IR1**
2. How attractive is the respondent's personality?	**H2IR2**
3. How well groomed was the respondent?	**H2IR3**
4. How candid was the respondent?	**H2IR4**
5. How physically mature was the respondent compared with other adolescents of {HIS/HER} age?	**H2IR5**
6. Was a third person present during any portion of the interview—not just walking through the area where the interview was being administered, but listening to or taking part in the interview process?	**H2IR6**
7. Who was present?	
wife or husband	**H2IR7A**
partner	**H2IR7B**
son	**H2IR7C**
daughter	**H2IR7D**
brother	**H2IR7E**
brother's wife	**H2IR7F**
brother's partner	**H2IR7G**
sister	**H2IR7H**
sister's husband	**H2IR7I**
sister's partner	**H2IR7J**
father	**H2IR7K**
father's wife	**H2IR7L**
father's partner	**H2IR7M**
mother	**H2IR7N**
mother's husband	**H2IR7O**
mother's partner	**H2IR7P**
father-in-law	**H2IR7Q**
mother-in-law	**H2IR7R**
grandfather	**H2IR7S**
grandmother	**H2IR7T**
great-grandfather	**H2IR7U**
great-grandmother	**H2IR7V**

Question	Variable Name
uncle	**H2IR7W**
aunt	**H2IR7X**
cousin	**H2IR7Y**
nephew	**H2IR7Z**
niece	**H2IR7AA**
other relative	**H2IR7BB**
other non-relative	**H2IR7CC**
unable to determine relationship	**H2IR7DD**
8. Record how many people other than those indicated in Q.7 were in each of the following age categories.	
under 6	**H2IR8A**
6-11	**H2IR8B**
12-18	**H2IR8C**
19 and older	**H2IR8D**
9. Where was the interview conducted?	**H2IR9**
10. In what kind of building does the respondent live?	**H2IR10**
11. How well kept is the building in which the respondent lives?	**H2IR11**
12. How would you describe the immediate area or street (one block, both sides) where the respondent lives?	**H2IR12**
13. What type of residence is most common on the street (one block, both sides) where the respondent lives?	**H2IR13**
14. How well kept are most of the buildings on the street?	**H2IR14**
15. When you went to the respondent's home, did you feel concerned for your safety?	**H2IR15**
16. Number of interruptions during the interview.	**H2IR16**
17. Reason(s) for interruptions.	
respondent answered telephone call	**H2IR17A**
respondent placed telephone call	**H2IR17B**
respondent dealt with visitors, salesmen, repairmen	**H2IR17C**
household members passed through	**H2IR17D**
respondent attended to child's needs	**H2IR17E**
respondent attended to household responsibilities	**H2IR17F**
respondent's or interviewer's needs	**H2IR17G**
environmental distractions	**H2IR17H**
respondent obtained interview information	**H2IR17I**
other	**H2IR17J**
18. Did the respondent appear to be drunk or under the influence of a drug?	**H2IR18**
19. Did the respondent ever seem bored or impatient during the interview?	**H2IR19**
20. Did the respondent's boredom or impatience negatively affect the quality of the interview?	**H2IR20**
21. Did the respondent ever appear embarrassed about answering questions during the interview?	**H2IR21**
22. What topics did the respondent appear embarrassed about?	
General Introductory	**H2IR22A**

Question	Variable Name
Daily Activities	**H2IR22B**
General Health	**H2IR22C**
Nutrition	**H2IR22D**
Sun Exposure	**H2IR22E**
Academics and Education	**H2IR22F**
Access to Health Services	**H2IR22G**
Pregnancy, AIDS, and STD Risk Perceptions	**H2IR22H**
Self Efficacy	**H2IR22I**
Feelings Scale	**H2IR22J**
Household Roster	**H2IR22K**
Non-Resident Biological Mother	**H2IR22L**
Non-Resident Biological Father	**H2IR22M**
Resident Mother	**H2IR22N**
Resident Father	**H2IR22O**
Relations with Parents	**H2IR22P**
Motivations to Engage in Risky Behaviors	**H2IR22Q**
Personality and Family	**H2IR22R**
Knowledge Quiz	**H2IR22S**
Friends	**H2IR22T**
Romantic Relationship Roster	**H2IR22U**
Liked Relationship Roster	**H2IR22V**
Contraception	**H2IR22W**
Relationship Information	**H2IR22X**
Non-Relationship History	**H2IR22Y**
Motivations for Birth Control	**H2IR22Z**
Tobacco, Alcohol, Drugs	**H2IR22AA**
Delinquency Scale	**H2IR22BB**
Fighting and Violence	**H2IR22CC**
Joint Occurrences	**H2IR22DD**
Physical Development/Pregnancy History	**H2IR22EE**
Suicide	**H2IR22FF**
Parents' Attitudes	**H2IR22GG**
Protective Factors	**H2IR22HH**
Neighborhood	**H2IR22II**
Religion	**H2IR22JJ**
Expectations, Employment, Income	**H2IR22KK**
Relations with Siblings	**H2IR22LL**
23. Was there any evidence of smoking in the household—for example, ashtrays, people smoking, cigarettes, the smell of cigarettes?	**H2IR23**
24. Did you see any evidence of drinking in the household—for example, beer cans, liquor bottles, people drinking?	H**2IR24**
25. In what language was the interview conducted?	**H2IR25**
26. Is the respondent blind?	**H2IR26**

Question — Variable Name

27. Is the respondent deaf? **H2IR27**
28. Is the respondent physically disabled? **H2IR28**
31. Note anything else essential to the interpretation and understanding of this interview. **H2IR31**

Appendix E: Delinquency Scale

In Home Questionnaire Code Book II, S.28

Frequency	Code	Response	Variable Name	Type/ Length

In Section 28

Section 28: Delinquency Scale—Audio CASI

respondents are asked to report their recent delinquent or undesirable behaviors.

The next few questions are about vandalism, violence and weapons.

In the past 12 months, how often did you...

1. paint graffiti or signs on someone else's property or in a public place?			**H2DS1**	num 1
13627	0	never		
697	1	1 or 2 times		
161	2	3 or 4 times		
163	3	5 or more times		
60	6	refused		
30	8	don't know		
2. deliberately damage property that didn't belong to you?			**H2DS2**	num 1
12690	0	never		
1540	1	1 or 2 times		
224	2	3 or 4 times		
200	3	5 or more times		
62	6	refused		
22	8	don't know		

3. lie to your parents or guardians about where you had been or whom you were with?			**H2DS3**	num 1
7952	0	never		
4279	1	1 or 2 times		
1157	2	3 or 4 times		
1260	3	5 or more times		
62	6	refused		
28	8	don't know		
How often did you...				
4. take something from a store without paying for it?			**H2DS4**	num 1

Frequency	Code	Response	Variable Name	Type/ Length
11890	0	never		
1792	1	1 or 2 times		
422	2	3 or 4 times		
546	3	5 or more times		
61	6	refused		
27	8	don't know		
5. run away from home?			**H2DS5**	num 1
13756	0	never		
727	1	1 or 2 times		

100	2	3 or 4 times		
80	3	5 or more times		
56	6	refused		
19	8	don't know		
6. drive a car without its owner's permission?			**H2DS6**	num 1
13496	0	never		
902	1	1 or 2 times		
128	2	3 or 4 times		
140	3	5 or more times		
53	6	refused		
19	8	don't know		
7. In the past 12 months, how often did you steal something worth more than $50?			**H2DS7**	num 1
13977	0	never		
462	1	1 or 2 times		
93	2	3 or 4 times		
133	3	5 or more times		
56	6	refused		
17	8	don't know		

Frequency	Code	Response	Variable Name	Type/ Length

How often did you...				
8. go into a house or building to steal something?			**H2DS8**	num 1
14077	0	never		
414	1	1 or 2 times		
71	2	3 or 4 times		
100	3	5 or more times		
54	6	refused		
22	8	don’t know		
9. use or threaten to use a weapon to get something from someone?			**H2DS9**	num 1
14141	0	never		
388	1	1 or 2 times		
73	2	3 or 4 times		
65	3	5 or more times		
52	6	refused		
19	8	don’t know		
10. sell marijuana or other drugs?			**H2DS10**	num 1
13550	0	never		
546	1	1 or 2 times		
190	2	3 or 4 times		
373	3	5 or more times		

56	6	refused		
23	8	don't know		
11. steal something worth less than $50?			H2DS11	num 1
12395	0	never		
1430	1	1 or 2 times		
311	2	3 or 4 times		
526	3	5 or more times		
56	6	refused		

Frequency	Code	Response	Variable Name	Type Length
20	8	don't know		
12. act loud, rowdy, or unruly in a public place?			H2DS12	num 1
8881	0	never		
4006	1	1 or 2 times		
895	2	3 or 4 times		
880	3	5 or more times		
52	6	refused		
24	8	don't know		
In the past 12 months, how often did you...				
13. take part in a fight where a group of your friends was against another group?			H2DS13	num 1

12018	0	never		
2013	1	1 or 2 times		
367	2	3 or 4 times		
270	3	5 or more times		
50	6	refused		
20	8	don’t know		
14. Have you been initiated into a named gang?			**H2DS14**	num 1
13958	0	no		
704	1	yes		
51	6	refused		
25	8	don’t know		

Appendix F: List of the Nesting Rules That Describe the Missingness Pattern

1. Race (5)
2. H2TO3recod (7)
3. H2HS3recod (7)
4. H2JO11recod (10)
5. H2TO36recod (11)
6. healthydiettotal (14)
7. schconnecttotal (16)
8. churchtotal (45)
9. riskbehavintoxitotal (63)
10. aggressiontotal (66)
11. schooltotal (67)
12. H2TO61recod (70)
13. weapontotal (72)
14. H2TO58recod (75)
15. H2TO54recod (78)
16. H2TO44recod (79)
17. H2TO50recod (85)
18. scoresses (88)
19. injurytotal (100)
20. riskysextotal (129)
21. delinquencytotal (129)
22. alcoholtotal (143)

Appendix G: The Sample Covariance Matrix (k x k)

The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

The Sample Covariance Matrix

	Physical activity	Weapon carrying and use	Delinquency	Aggression	Risky sex	Cigarette smoking
Physical activity/H2DA5rec	3.675					
Weapon carrying and use/weaponto	0.156	8.326				
Delinquency/delinque	0.121	3.577	26.980			
Aggression/aggressi	0.242	2.478	2.988	6.552		
Risky sex/riskysex	-0.657	2.092	2.773	1.750	34.850	
Cigarette smoking/H2TO3rec	-0.192	0.590	1.133	0.545	1.770	2.000
Marijuana use/ H2TO44re	-0.072	0.855	1.649	0.686	1.784	0.627
Cocaine use/H2TO50re	-0.190	0.804	1.415	0.571	1.424	0.491
Inhalants use/H2TO54re	0.012	0.886	1.569	0.552	0.456	0.289
Heroin use/H2TO58re	-0.179	0.695	1.685	0.569	1.556	0.555
Needle use for drug injection/H2TO61re	0.061	0.947	1.647	0.691	0.765	0.262
Alcohol misuse/alcohol	-0.166	3.447	7.239	3.202	8.378	3.021
Driving drunk/H2TO36re	-0.087	0.531	1.194	0.491	1.485	0.451
Driving high on drugs/H2JO11re	-0.140	0.701	1.538	0.523	1.688	0.550
Risk behavior intoxicated/riskbeha	-0.027	3.683	4.719	3.021	4.993	1.472
Healthy diet/healthyd	0.614	-0.166	-0.489	-0.109	-1.127	-0.295
Dental hygiene/H2HS3rec	0.163	-0.142	0.052	-0.124	-0.410	-0.036
Safety equipment use/H2GH36re	-1.737	-2.445	-2.268	-1.463	2.422	0.072
Wearing a seat belt /H2GH39re	-0.005	-0.827	-1.014	-0.777	-1.301	-0.426
Religiosity/churchto	-0.267	0.671	1.188	0.485	1.997	0.790
School performance/schoolto	0.411	0.561	1.038	0.827	-0.778	0.065
School connectedness/schconne	-0.295	0.406	1.631	0.418	-0.020	0.065
Sex/BIO_SEX2	-0.515	-0.669	-0.305	-0.468	-0.109	0.010
Age/CALCAGE2	-0.896	-0.084	-0.310	-0.308	4.050	0.486
SES/scoreses	0.208	-0.373	0.084	-0.307	-0.797	0.372
Race	0.165	-0.440	-0.106	-0.343	-0.443	-0.148
Assault-injury/injuryto	0.194	2.393	2.430	2.380	1.928	0.491

Note: The matrix is (k x k). The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

Covariance Matrix

	Marijuana use	Cocaine use	Inhalants use	Heroin use	Needle use for injecting drugs	Alcohol misuse
Marijuana use/ H2TO44re	2.000					
Cocaine use/H2TO50re	0.649	2.000				
Inhalants use/H2TO54re	0.394	0.549	2.000			
Heroin use/H2TO58re	0.751	0.764	0.588	2.000		
Needle use for drug injection/H2TO61re	0.404	0.700	0.647	0.691	2.000	
Alcohol misuse/alcohol	3.552	2.619	1.517	3.196	1.380	55.623
Driving drunk/H2TO36re	0.553	0.501	0.314	0.502	0.423	3.898
Driving high on drugs/H2JO11re	0.892	0.621	0.369	0.695	0.437	3.302
Risk behavior intoxicated/riskbeha	1.833	1.619	1.247	1.634	1.376	10.174
Healthy diet/healthyd	-0.184	-0.154	0.008	-0.087	-0.065	-0.813
Dental hygiene/H2HS3rec	0.007	-0.034	0.047	0.064	-0.002	0.376
Safety equipment use/H2GH36re	0.022	0.378	-0.944	0.062	-0.240	0.949
Wearing a seat belt /H2GH39re	-0.323	-0.350	-0.208	-0.266	-0.155	-1.436
Religiosity/churchto	0.678	0.645	0.351	0.732	0.321	3.306
School performance/schoolto	0.167	-0.172	0.042	-0.147	-0.182	-0.533
School connectedness/schconne	0.315	0.026	0.249	0.226	-0.197	1.003
Sex/BIO_SEX2	-0.028	-0.017	0.028	0.012	-0.978	-0.397
Age/CALCAGE2	0.467	0.432	-0.367	0.333	-0.084	3.796
SES/scoreses	-0.034	-0.094	0.054	0.084	0.001	0.307
Race	0.019	-0.028	0.141	0.197	0.071	1.300
Assault-injury/injuryto	0.621	0.620	0.595	0.558	0.751	2.735

Note: The matrix is (k x k). The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

Covariance Matrix

	Driving drunk	Driving high on drugs	Risk behavior intoxicated	Healthy diet	Dental hygiene	Safety equipment use
Driving drunk/H2TO36re	2.000					
Driving high on drugs/H2JO11re	0.745	2.000				
Risk behavior intoxicated/riskbeha	1.647	1.734	15.557			
Healthy diet/healthyd	-0.274	-0.196	-0.221	16.601		
Dental hygiene/H2HS3rec	0.109	0.080	-0.077	0.350	2.000	
Safety equipment use/H2GH36re	0.160	-0.003	-1.110	0.109	0.230	171.451
Wearing a seat belt /H2GH39re	-0.366	-0.320	-1.191	0.707	0.252	2.328
Religiosity/churchto	0.462	0.689	1.447	-0.844	-0.171	0.247
School performance/schoolto	-0.412	-0.365	-0.049	-0.231	-0.159	-3.097
School connectedness/schconne	0.062	0.176	0.107	-0.584	0.042	-1.584
Sex/BIO_SEX2	-0.169	-0.092	-0.615	-0.120	0.053	1.910
Age/CALCAGE2	1.016	0.950	1.382	-0.412	-0.218	3.358
SES/scoreses	0.165	0.072	-0.271	0.245	0.438	0.252
Race	0.315	0.276	0.003	-0.211	0.378	-0.366
Assault-injury/injuryto	0.452	0.527	2.810	-0.079	-0.123	-1.234

Note: The matrix is (k x k). The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

Covariance Matrix

	Wearing a seat belt	Religion	School performance	School connectedness	Sex	Age
Wearing a seat belt /H2GH39re	6.143					
Religiosity/churchto	-0.492	15.228				
School performance/schoolto	-0.709	-0.071	25.295			
School connectedness/schconne	-0.208	0.686	5.624	28.171		
Sex/BIO_SEX2	0.324	-0.275	-0.478	0.152	2.000	
Age/CALCAGE2	0.238	0.836	-2.460	-0.839	-0.144	15.760
SES/scoreses	0.447	-0.465	-0.318	0.174	-0.077	-0.187
Race	0.123	0.424	-0.592	-0.067	-0.005	-0.362
Assault-injury/injuryto	-0.590	0.449	0.452	0.260	-0.524	0.029

Note: The matrix is (k x k). The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

Covariance Matrix

	SES	Race	Assault-injury
Race	5.665		
SES/scoreses	0.570	4.672	
Assault-injury/injuryto	-0.327	-0.380	5.233

Note: The matrix is (k x k). The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

Appendix H: The Sample Covariance Matrix of Latent Factors and Variables (k x k)

The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

The Sample Covariance Matrix of Factors and Independent Latent Variables

	Protection	Addiction	High Action	Sex	Age	SES	Race	Assault-injury
Protection/Protecti	0.312							
Addiction/Addictio	-0.012	0.492						
High Action/High Act	0.147	0.206	2.820					
Sex/BIO_SEX2	-0.411	-0.049	-0.348	1.962				
Age/CALCAGE2	-0.924	0.554	-0.220	-0.300	15.760			
SES/scoreses	0.009	0.000	-0.371	-0.081	-0.187	5.665		
Race	0.025	0.160	-0.441	-0.017	-0.362	0.570	4.672	
Assault-injury/injuryto	0.196	0.494	2.398	-0.334	0.029	-0.327	-0.380	5.233

Note: The matrix is (k x k). The diagonal values are the sample variance of the observed variables. The elements below are estimates of the sample covariance between each pair of the observed variables.

Appendix I. List of LISREL Goodness-of-Fit Statistics of the Hypothetical Model

Degrees of Freedom for (C1)-(C2)	304
Maximum Likelihood Ratio Chi-Square (C1)	16093.217 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)	15806.012 (P = 0.0000)
Estimated Non-centrality Parameter (NCP)	15789.217
90 Percent Confidence Interval for NCP	(15376.908 ; 16208.246)
Minimum Fit Function Value	1.275
Population Discrepancy Function Value (F0)	1.251
90 Percent Confidence Interval for F0	(1.218 ; 1.284)
Root Mean Square Error of Approximation (RMSEA)	0.0641
90 Percent Confidence Interval for RMSEA	(0.0633 ; 0.0650)
P-Value for Test of Close Fit (RMSEA < 0.05)	1.000
Expected Cross-Validation Index (ECVI)	1.287
90 Percent Confidence Interval for ECVI	(1.254 ; 1.320)
ECVI for Saturated Model	0.0599
ECVI for Independence Model	3.817
Chi-Square for Independence Model (351 df)	48130.847
Normed Fit Index (NFI)	0.666
Non-Normed Fit Index (NNFI)	0.618
Parsimony Normed Fit Index (PNFI)	0.577
Comparative Fit Index (CFI)	0.670
Incremental Fit Index (IFI)	0.670
Relative Fit Index (RFI)	0.614
Critical N (CN)	286.712
Root Mean Square Residual (RMR)	0.904
Standardized RMR	0.0713
Goodness of Fit Index (GFI)	0.915
Adjusted Goodness of Fit Index (AGFI)	0.894
Parsimony Goodness of Fit Index (PGFI)	0.736

Appendix J. List of LISREL Goodness-of-Fit Statistics of the Modified Model

Degrees of Freedom for (C1)-(C2)	286
Maximum Likelihood Ratio Chi-Square (C1)	5570.776 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)	5670.618 (P = 0.0000)
Estimated Non-centrality Parameter (NCP)	5284.776
90 Percent Confidence Interval for NCP	(5045.920 ; 5530.857)
Minimum Fit Function Value	0.441
Population Discrepancy Function Value (F0)	0.419
90 Percent Confidence Interval for F0	(0.400 ; 0.438)
Root Mean Square Error of Approximation (RMSEA)	0.0383
90 Percent Confidence Interval for RMSEA	(0.0374 ; 0.0391)
P-Value for Test of Close Fit (RMSEA < 0.05)	1.000
Expected Cross-Validation Index (ECVI)	0.456
90 Percent Confidence Interval for ECVI	(0.437 ; 0.475)
ECVI for Saturated Model	0.0599
ECVI for Independence Model	3.817
Chi-Square for Independence Model (351 df)	48130.847
Normed Fit Index (NFI)	0.884
Non-Normed Fit Index (NNFI)	0.864
Parsimony Normed Fit Index (PNFI)	0.721
Comparative Fit Index (CFI)	0.889
Incremental Fit Index (IFI)	0.890
Relative Fit Index (RFI)	0.858
Critical N (CN)	781.691
Root Mean Square Residual (RMR)	0.460
Standardized RMR	0.0443
Goodness of Fit Index (GFI)	0.968
Adjusted Goodness of Fit Index (AGFI)	0.957
Parsimony Goodness of Fit Index (PGFI)	0.732

Appendix K. List of LISREL Goodness-of-Fit Statistics of the Nonrecursive Model

Degrees of Freedom for (C1)-(C2)	282
Maximum Likelihood Ratio Chi-Square (C1)	10073.438 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)	0.0 (P = 1.0000)
Estimated Non-centrality Parameter (NCP)	9791.438
90 Percent Confidence Interval for NCP	(9466.896 ; 10122.992)
Minimum Fit Function Value	0.798
Population Discrepancy Function Value (F0)	0.776
90 Percent Confidence Interval for F0	(0.750 ; 0.802)
Root Mean Square Error of Approximation (RMSEA)	0.0524
90 Percent Confidence Interval for RMSEA	(0.0516 ; 0.0533)
P-Value for Test of Close Fit (RMSEA < 0.05)	1.000
Expected Cross-Validation Index (ECVI)	0.813
90 Percent Confidence Interval for ECVI	(0.788 ; 0.839)
ECVI for Saturated Model	0.0599
ECVI for Independence Model	3.817
Chi-Square for Independence Model (351 df)	48130.847
Normed Fit Index (NFI)	0.791
Non-Normed Fit Index (NNFI)	0.745
Parsimony Normed Fit Index (PNFI)	0.635
Comparative Fit Index (CFI)	0.795
Incremental Fit Index (IFI)	0.795
Relative Fit Index (RFI)	0.739
Critical N (CN)	427.233
Root Mean Square Residual (RMR)	0.511
Standardized RMR	0.0452
Goodness of Fit Index (GFI)	0.947
Adjusted Goodness of Fit Index (AGFI)	0.930
Parsimony Goodness of Fit Index (PGFI)	

Appendix L. List of LISREL Goodness-of-Fit Statistics of the Modified Nonrecursive Model

Degrees of Freedom for (C1)-(C2)	280
Maximum Likelihood Ratio Chi-Square (C1)	5651.490 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)	0.0 (P = 1.0000)
Estimated Non-centrality Parameter (NCP)	5371.490
90 Percent Confidence Interval for NCP	(5130.765 ; 5619.433)
Minimum Fit Function Value	0.448
Population Discrepancy Function Value (F0)	0.426
90 Percent Confidence Interval for F0	(0.406 ; 0.445)
Root Mean Square Error of Approximation (RMSEA)	0.0390
90 Percent Confidence Interval for RMSEA	(0.0381 ; 0.0399)
P-Value for Test of Close Fit (RMSEA < 0.05)	1.000
Expected Cross-Validation Index (ECVI)	0.463
90 Percent Confidence Interval for ECVI	(0.444 ; 0.483)
ECVI for Saturated Model	0.0599
ECVI for Independence Model	3.817
Chi-Square for Independence Model (351 df)	48130.847
Normed Fit Index (NFI)	0.883
Non-Normed Fit Index (NNFI)	0.859
Parsimony Normed Fit Index (PNFI)	0.704
Comparative Fit Index (CFI)	0.888
Incremental Fit Index (IFI)	0.888
Relative Fit Index (RFI)	0.853
Critical N (CN)	755.830
Root Mean Square Residual (RMR)	0.545
Standardized RMR	0.0377
Goodness of Fit Index (GFI)	0.967
Adjusted Goodness of Fit Index (AGFI)	0.955
Parsimony Goodness of Fit Index (PGFI)	0.716

Appendix M. List of LISREL Goodness-of-Fit Statistics of the Alternative Model

Degrees of Freedom for (C1)-(C2)	158
Maximum Likelihood Ratio Chi-Square (C1)	6007.995 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)	0.00 (P = 1.0000)
Estimated Non-centrality Parameter (NCP)	5849.995
90 Percent Confidence Interval for NCP	(5600.168 ; 6107.011)
Minimum Fit Function Value	0.476
Population Discrepancy Function Value (F0)	0.463
90 Percent Confidence Interval for F0	(0.444 ; 0.484)
Root Mean Square Error of Approximation (RMSEA)	0.0542
90 Percent Confidence Interval for RMSEA	(0.0530 ; 0.0553)
P-Value for Test of Close Fit (RMSEA < 0.05)	1.000
Expected Cross-Validation Index (ECVI)	0.488
90 Percent Confidence Interval for ECVI	(0.468 ; 0.508)
ECVI for Saturated Model	0.0366
ECVI for Independence Model	3.524
Chi-Square for Independence Model (210 df)	44438.926
Normed Fit Index (NFI)	0.865
Non-Normed Fit Index (NNFI)	0.824
Parsimony Normed Fit Index (PNFI)	0.651
Comparative Fit Index (CFI)	0.868
Incremental Fit Index (IFI)	0.868
Relative Fit Index (RFI)	0.820
Critical N (CN)	425.951
Root Mean Square Residual (RMR)	0.503
Standardized RMR	0.0448
Goodness of Fit Index (GFI)	0.956
Adjusted Goodness of Fit Index (AGFI)	0.935
Parsimony Goodness of Fit Index (PGFI)	0.654