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Demographics, Self-Autonomy, and Relationships as Predictors of Substance Use Among Community College Learners

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Walden University
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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Psychology

General Psychology

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Abstract

Abuse of prescription and over-the-counter substances other than alcohol is becoming a prevalent issue; therefore, it is important to identify factors that may help predict risk for this abuse. Some demographic and situational factors have been identified for traditional 4-year college students. However, less is known about community college students, who enter college less academically prepared and may be still enmeshed with family and peer groups from high school. In this correlational study, predictors of substance abuse other than alcohol were explored among a convenience sample of 118 students from an American community college. The research question was developed based on previous research such as Bandura's social learning theory and Arnett's theory of emerging adults. The question explored how well gender (male, female, other) and 2 dimensions from the Ryff scale of psychological well-being (sense of autonomy and positive relationships with others) predict substance use among the community college sample. Use of substances other than alcohol was measured using the Drug Abuse Screening Test-10. A multiple linear regression analysis was used to test the research hypotheses. Although gender was not related to substance use, higher autonomy and more positive relationships scores were statistically significant predictors of higher use of substances other than alcohol among this sample. These findings were consistent with characteristics of emerging adulthood that may present risk factors for this group of college students. Findings support positive social change as they may be considered by stakeholders when considering possible prevention or intervention activities to address substance use issues on community college campuses.

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Dedication

I dedicate this research journey to my legacy, my king, my son Juelz F. Robertson, to affirm to him, all things are possible despite your obstacles when you persist until success happens (P. U. S. H.). I also dedicate this research journey to a queen, Dr. Tonya Boyd, for the motivation and aggravation required for success. I want to finalize my research journey dedication to a king pioneer of addiction medicine Dr. Elmer Neil (1936-2016), for his mentoring molded me into the addiction professional and student I am today for social change: for now I am here.

Acknowledgments

I want to acknowledge my dissertation committee, Dr. Donna Heretick, Dr. Arcella Trimble, and Dr. Maxwell Rainforth, for persisting until success happened with me. For the challenges were just as persistent as they were; but their academic dedication and professional ability prevailed. I want to close my acknowledgements to the family, friends, and cohort members whom were there through this research journey. For I persisted until success happened.

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Chapter 1: Introduction to the Study

Introduction

According to the Substance use and Mental Health Service Administration (SAMSHA, 2014), drug abuse among college students increased by 40% from 2010 to 2013. Other research has revealed an increase in the illicit use of nonmedical prescription painkillers and other illegal drugs other than alcohol among the undergraduate college student population in the United States (Hu, Primack, Barnett, & Cook, 2011; Kristen, 2010; Whiten, 2014). Findings from several studies have revealed a link between substance use and variables such as gender, sense of autonomy, and the nature of an individual's relationships with others (Arnett, 2014; Day, Metrik, Spillane, & Kahler, 2013; Hu et al., 2011). Additionally, personal desire for self-sufficiency, the need for peer acceptance, and social environments that condone the use of drugs are related to substance use among undergraduate college students (Arnett, 2014; Kristen, 2010; Pope, Ionescu-Pioggia, & Pope, 2014). Additional risk factors may exist among first-year community college learners, as they often have lower enrolling GPA, lower socioeconomic status, and first-generation dependency during the postsecondary educational experience (College Board Trends in Community College, 2016).

This study was important because substance use leads to negative consequences for both individuals and society. Substance use other than alcohol among college students is known to be associated with diminished cognitive processes (Kandel, 2002), impaired psychomotor skills (Whitten, 2014), and the decline in a student's ability to perform daily

tasks that are necessary for academic success and social stability (Day, Metrik, Spillane, & Kahler, 2013).

The purpose of this study was to examine the relationship between self-reported substance use other than alcohol among a sample of community college students, considering their age, ethnicity, gender, self-autonomy, and positive relationships with others as possible predictive factors. Although there is an abundance of literature on demographic variables related to substance use among traditional age (i.e., 18 to 25 years) college students attending 4-year institutions, there is a lack of knowledge on social and developmental variables that contribute to substance use other than alcohol among students attending 2-year institutions in the United States (Theron & Liebenberg, 2015). The primary focus of this study was to gather information on substance use other than alcohol in community college students to better identify risk factors for intervention and prevention programs that address substance use issues on community college campuses in the United States. A secondary outcome is contributing to the body of literature on substance use in the community college student population.

In this chapter, I discuss the background, purpose, nature, and significance of the study. This chapter also includes the problem statement, research questions, and hypotheses, as well as the scope, limitations, and delimitations. I also discuss the theoretical foundation in addition to some of the relevant research literature to this study.

Background

As of 2016, approximately 129 deaths occur daily in the United States due to a substance-induced overdose of nonmedical prescription painkillers (SAMSHA, 2016).

Nearly 42% of the substance-induced deaths were among individuals between the ages of 18 to 25 (SAMHSA, 2016). Leaders at the CDC (2015) reported that 44 deaths occur daily due to prescription painkiller overdoses. Results from research by the National Survey on Drug Use and Health (NSDUH; 2014) further revealed that greater than 20% of drug abusers with a diagnosed substance use disorder obtained prescription painkillers from a physician, and greater than 50% of the identified research sample obtained drugs from friends. The statistics presented in the NSDUH report supports the notion that there is a public health epidemic of prescription painkiller substance use in the United States.

According to the Center for Lawful Access and Abuse Deterrence (2014), the abuse of nonmedical prescription painkillers is common among college students. Research conducted by the Center for Lawful Access and Abuse Deterrence revealed that 4.1% to 10.8% of students reported using nonmedical prescription drugs within the year preceding the study. The study findings also revealed greater than 73% of students obtained the drugs from peers with a medical prescription (Center for Lawful Access and Abuse Deterrence, 2014; Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012).

Aside from the Center for Lawful Access and Abuse Deterrence (2014), other researchers have supported the concern with college students' use of prescription painkillers. Whitten (2014) claimed that approximately one out of three college students has engaged in the nonmedical use of drugs or witnessed a peer's nonmedical use of prescription painkillers. Day et al. (2013) also revealed that a high percentage of undergraduate students' academic challenges are related to students' self-reported drug abuse. Research shows that the rate of nonmedical prescription painkiller abuse has

increased by 53% among college students within the last 3 years (U.S. Federal Drug Enforcement Administration, 2015). Recent research on substance use among undergraduates showed a significant increase in substance use other than alcohol among traditional age (18 to 25 years) community college students (Rigg & Monnal, 2014). This increased substance use has resulted in students' self-discloser of experiencing challenges with their academic performance because of drug abuse (SAMSHA, 2016; Whitten, 2014).

The increased enrollment into community colleges have progressed the rate of drug abuse and lower academic performance on community college campuses. Baum, Little, and Payea (2017) revealed that greater than 40% of enrolled students in community colleges are presently African American or Hispanic, accounting for the increased ethnic student population attending community colleges. In 2014, approximately 44% of African American and 56% Hispanic students were enrolled in 2-year institutions compared to 29% of European American students enrolled in 4-year institution (Baum et al., 2017). The increased ethnic population enrolled into 2-year institutions versus 4-year institutions is also accounted for by community colleges' open enrollment polices with no minimum grade point average for previous school performance (National Center for Education Statistics [NCES], 2012). In addition, the lower tuition costs accommodate students from lower socioeconomic statuses who pursue postsecondary education.

There are other factors that impact rates of substance use in addition to a correlation with increased enrollment. Fagan, Van Horn, Hawkins, and Arthur (2007)

explored whether gender differences and social variables such as peer influence contributed to deviant and maladaptive behavior such as drug abuse among college students. They revealed that the level of self-reported drug abuse other than alcohol among males was significantly greater than the levels of self-reported drug abuse other than alcohol among females (Fagan et al., 2007). Another study showed that approximately 45% of all undergraduates who engaged in drug abuse were males with an average age of 21, and 30% of undergraduate students acknowledged having at least one friend or peer who engaged in drug abuse (Meisel, Clifton, MacKillop, & Goodie, 2015). Teter et al. (2006) reported that European American males were 3 times more likely to engage in recreational substance use than Hispanic males, and African American males were more than twice as likely to engage in recreational substance use compared to Hispanic and Asian males. Additionally, Arria et al. (2017) illustrated a relationship between the developmental environment and substance use. Findings from the study showed that positive social environments and positive social role models were related to decreased rates of substance use.

There are many types of drugs other than alcohol that college students use that affect their academic performance. Kristen (2010) reported several types of drugs that are abused by college students, including organic substances containing psychoactive compounds, which produce euphoria and the desire of continual use by undergraduate students. The manufactured compounds pharmacologically defined as synthetic and semisynthetic opiates/opioids also foster addiction (Kristen, 2010). Neurological studies have shown that psychoactive substances cause damage to the central nervous system,

which is composed of the brain and the spinal cord (Fraser, 2011). Research has linked the continual abuse of psychoactive substances to negative outcomes such as reduced cognitive competence and induced behavioral maladaptation, both of which negatively affect a college student's academic performance (White, Becker-Blease, & Bishop, 2014).

The deteriorating effects of drug abuse concurrently occur with major declines in undergraduate students' academic performance in the areas of science, math, and social skills (Kandel, 2002). The damage caused by illicit substance use contributes to the challenges of successful completion of certificate programs and the high rates of substance use other than alcohol among college students (Kandel, 2002). The data collected in this study can provide administrators, faculty, and staff vital information regarding the occurrence of substance use at the community college and whether there may be a need for substance use education and program prevention at the community college level.

Problem Statement

Kristen (2010) reported that approximately 60% of undergraduate college students had engaged in the substance use of nonmedical prescription painkillers. Findings from several studies revealed a link between variables such as age, gender, sense of autonomy, and nature of relationships with others (Pope et al., 2014; Primack et al., 2011). Results from other studies have shown that psychosocial variables such as ethnicity, personal desire for self-sufficiency, the need for peer acceptance, and social

environments that condone the use of drugs were related to substance use among undergraduate college students (Arnett, 2014; Pope et al., 2014).

Although there is ample research on the relationships between psychosocial variables and substance use among students in 4-year colleges, I located no other research that addressed variables related to substance use other than alcohol in community college students. According to the National Center for Education (2012), more than 60% of undergraduate first-year students attend a 2-year college, accounting for the largest sector of enrolled student population. Thus, there is a gap in the research regarding the social and developmental variables that contribute to substance use other than alcohol among students attending 2-year institutions in the United States (Areheart-Treichel, 2014). Information from this study can be used to fill the gap in the literature by examining the developmental and social variables related to substance use other than alcohol among traditional age (18 to 25 years) community college students.

Purpose of Study

The purpose of this quantitative, nonexperimental, correlational study was to examine age, ethnicity, gender, self-autonomy, and positive relationships with others as predictors of self-reported substance use other than alcohol among a sample of community college students. Researchers have identified variables such as age, ethncity, gender, sense of autonomy, and nature of relationships with others related to substance use among undergraduate college students attending 4-year colleges (Arnett, 2014; Hu et al., 2011; Kristen, 2010; Pope et al., 2014; Primack et al., 2011; Whitten, 2014).

However, similar research is not available regarding these factors for community college students.

Research Questions

I examined possible predictors for the level of self-reported substance use other than alcohol among traditional age (18-25 years) community college students. The planned independent variables were age, ethnicity, gender, sense of autonomy, and nature of relationships with others. However, the Institutional Review Board (IRB) did not approve the collection of age and ethnicity data. The dependent variable was the level of self-reported substance use other than alcohol. The four primary research questions and associated null hypotheses for this study were:

Research Question 1: How well do demographics (e.g., gender) predict self-reported substance use other than alcohol among first-year 2-year college students as determined by scores on the Drug Abuse Screening Test (DAST-10)?

$H_0$1: There will not be a statistically significant relationship among demographics (e.g., gender) and the level of self-reported substance use other than alcohol among first-year 2-year collegestudents(as determined by scores on the DAST-10), in a sample of traditional age (18 to 25 years) community college students.

H_a1: There will be a statistically significant relationship among demographics (e.g., gender) and the level of self-reported substance use other than alcohol among first-year 2-year collegestudents(as determined by scores on the DAST-10), in a sample of traditional age (18 to 25 years) community college students.

Research Question 2: How well does sense of autonomy predict self-reported substance use other than alcohol among first-year 2-year college students, with autonomy measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being?

$H_0$2: There will be no statistically significant relationship among sense of autonomy and the level of self-reported substance use other than alchol among first-year 2-year college students (as measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being).

H_a2: There will be a statistically significant relationship among sense of autonomy and the level of self-reported substance use other than alcohol among first-year 2-year college students (as measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being).

Research Question 3: How well do positive relationships with others predict self-reported substance use other than alcohol among first-year 2-year college students (as measured by the positive relations with others subscale from the Ryff Scale of Psychological Well-Being).

$H_0$3: There will be no statistically significant relationship between positive relationships with others and the level of self-reported substance use other than alchol among first-year 2-year college students (as measured by the positive relations with others subscale from the Ryff Scale of Psychological Well-Being).

H_a3: There will be a statistically significant relationship among positive relationships with others and the level of self-reported substance use other than alcohol

among first-year 2-year college students (as measured by the positive relationss with others subscale from the Ryff Scale of Psychological Well-Being).

Research Question 4: How well does the combination of variables (gender, sense of autonomy, and positive relationships with others) predict self-reported substance use other than alcohol?

$H_0$4: The independent variables of gender, sense of autonomy, and positive relationships with others (as measured by the autonomy and positive relations with others subscales from the Ryff Scales of Psychological Well-Being) will not predict a statistically significant amount of the variance in participants' level of self-reported substance use other than alchol (as determined by scores on the DAST-10).

H_a4: The independent variables of gender, sense of autonomy, and positive relationships with others (as measured by the autonomy and positive relations with others subscales from the Ryff Scales of Psychological Well-Being) will predict a statistically significant proportion of the variance in on the participants' level of self-reported substance use other than alcohol (as determined by scores on the DAST-10).

Conceptual Framework

The conceptual framework for this study was composed of principles from Albert Bandura's (1977) theory of social learning and Arnett's (2000) emerging adulthood theory, grounded in Erikson's' (1980) psychosocial stages of development theory. Bandura emphasized the social dynamics of learning, which occurs through observation defined as modeling within human development (Berger, 2011). Bandura claimed that most behaviors are learned deliberately or inadvertently through observation of

influential models. A model is definable as a parental model, influential individual, or peer who exhibit behaviors that are mimicked by another person (McCabe, Boyd, & Teter, 2009). Social modeling within secondary education occurs through peer associations, peer assimilation, and peer accommodation (Akers, 2009). Research has shown that some deviant adulthood behaviors manifested during the young adulthood stage are developed through social learning, peer interactions, and peer imitation (Akers & Jensen, 2003). Individuals frequently engage in deviant behavior to gain social acceptance from their peers (Akers & Jensen, 2003). Past research has shown a relationship between the recreational substance use and peer influence or the need for social affiliation among college students at four-year institutions (Feldman, 2014). Hence, the effect of modeling and learning helps to identify the social interactions and learned behaviors of undergraduate students in higher education (Peralta & Steele, 2010). Bandura's social learning theory in this context serves to illustrate the sociocultural norms and developmental influences within the first 2 years of higher education (Peralta & Steele, 2010).

Arnett's (2000) emerging adulthood theory also was used to guide this research. The emerging adulthood theory helps identify the critical stages of development that occur during the transition from late adolescence into young adulthood (Arnett, 2000). As proposed by Erikson (1980), each developmental stage is reflective of social and cultural influences, which determine productive or maladaptive behaviors throughout development. Arnett describes the transition from being an adolescent into being a young adult as an ambiguous moment in human development that brings with it considerable

challenges and confusion. A major premise of emerging adulthood theory is that emerging adults 18 to 25 years of age frequently observe and imitate social behaviors for peer acceptance and as a means of enhancing their social well-being (Arnett, 2000). The major principles of emerging adulthood theory that address the transitional period of development that occurs between 18 to 25 years are relevant to this research because it addresses some of the environmental factors that are related to drug abuse among the traditional age of community college students.

Nature of the Study

This research study has a quantitative, nonexperimental, correlational design. I collected data anonymously via web-administered surveys. I chose the quantitative nonexperimental design, as the variables under study cannot be manipulated; thus, an experimental design is not possible. However, by quantitatively measuring data in a systematic way, relationships can be studied with adequate reliability and validity of results. The targeted population was students attending a Mid-Atlantic community college in a Mid-Atlantic state in the United States.

The online survey included a demographics questionnaire, as well as the DAST-10 and the Ryff Scales of Psychological Well-Being. The approvals to use these instruments in this research study are found in Appendix A and Appendix B, respectively. The DAST-10 is used to assess self-reported substance use or abuse and other than alcohol within the last 12-months (American Society of Addiction Medicine, 2014). The Ryff Scales of Psychological Well-Being, short-form, is used to collect data on the following six domains of well-being: autonomy, environmental mastery, personal

growth, positive relations with others, purpose in life, and self-acceptance (Seifert, 2005). In this study, I examined autonomy and positive relationships with others.

Participants completed the survey online. Data from the survey were downloaded and then imported into SPSS for statistical analysis. I conducted linear regression analyses to assess five planned independent variables (age, ethnicity, gender, self-autonomy, and positive relationships with others) as predictors of a single dependent variable, self-reported substance use (Mertler & Vanatta, 2013).

Definitions

Community college: Nonresidential higher educational institution located in a local area providing a course to the community (State Council of Higher Education for Virginia, 2016).

Developmental factors: Biological, psychological, and environmental influences that affect an individuals' thoughts feelings, behaviors, and attitudes (Feldman, 2014).

Emerging adults: A transitional developmental stage from adolescence into early adulthood with increased emphasis on social cues and stimuli for development (Arnett, 2014).

Illicit substance: The abuse of illegal drugs and or misuse of prescription medication, household substances, or over-the-counter medication (American Psychiatric Association, 2013).

Maladaptive behavior: Behavior patterns counterproductive to optional functioning such as successful interaction with the environment or coping with challenges and stress (American Psychiatric Association, 2013).

Nonmedical prescription painkillers: Prescription medication used for recreational or illicit use (American Society of Addiction Medicine, 2014).

Polysubstance use: The consumption of more than three illicit substance at the same time (American Society of Addiction Medicine, 2014).

Self-autonomy: The state of independence from others (Feldman, 2014).

Social-cultural factors: Stimuli in cultures and society that affect an individuals' thoughts feelings, behaviors, and attitudes (Feldman, 2014).

Substance/drug abuse: A pattern of compulsive substance use marked by recurrent significant social, occupational, legal., or interpersonal adverse consequences such as repeated absences from work or school (American Psychological Association, 2014).

Substance Use and Mental Health Services Administration (SAMHSA): An agency of the U.S. Department of Health and Human Services established to improve the quality and availability of prevention treatment and rehabilitation services to reduce illness, death, and disparities (American Psychological Association, 2014).

Assumptions

This study included assumptions. The first assumption was that the surveys were useful for gathering subjective responses from participants that are honest and truthful. It is important for participants to give truthful responses to avoid inaccurate inferences based on the data collected in the study (Field, 2013). Participants who fail to provide honest responses can lead to distortions in the outcome of the study and should be removed from research study (Field, 2013). The DAST-10 addressed this issue by

including an index for social desirability, which helped to identify participants who may be responding less than honestly. Another assumption was the participants' level of understanding for self-autonomy (Ryff, 2014). A definition of self-autonomy was provided to ensure participants had a common definition of self-autonomy. I also assumed that respondents were literate in English and had reading comprehension levels appropriate to the survey materials. I assumed that respondents were motivated sufficiently to complete the survey materials, taking time to read each question and provide answers that are not careless or random.

The general assumption of survey research also applies to this study. Survey research involves the assumption that participants' responses to survey questions present a good measure of the social behavior being tested (Mertens, 2015; Skinner, 2001). Survey responses should represent scientifically legitimate data from which inferences may be drawn, known, or assumed (Mertens, 2015). In order to meet this assumption, I had selected survey measures with demonstrated reliability and validity regarding the constructs they were defining operationally (see Chapter 3). Further, I was able to evaluate possible socially desirable response biases regarding substance use through the index included within the DAST-10, as responses to Questions 4 and 5 help identify socially desirable responses (Skinner, 2001).

Scope and Delimitations

The primary focus of this study was to examine the correlation in age, ethnicity, gender, self-autonomy, and positive relationships of community college emerging adults' 18 to 25 with self-reported substance use other than alcohol behavior. Emerging adults 18

to 25 substance use addiction treatment was not be addressed in this study. The research was focused on the relationship in the self-reported substance use other than alcohol among a sample of community college students by age, ethnicity, gender, self-autonomy, and positive relationships with others. The targeted population included all undergraduate students age 18 and older enrolled in at least one class at the time of the study. The scope of the research was further limited to community college students at a Mid-Atlantic community college.

Limitations

There were several limitations in this study that may have affected its generalizability. This study was limited to community college students whom attend a Mid-Atlantic community college. A study of community college students from additional community colleges may provide a different presentation of recreational substance use other than alcohol on the variables of age, ethnicity, gender, sense of autonomy, and positive relationships with others in this study. Inclusion bias may also have been a limitation of the research findings. Inclusion bias in research is reflective of an overestimation or underestimation of truth within a specific group (Mertens, 2015). Inclusion was not a limitation in this study, as the study population must have attended at least one-year at the selected research study community college. Employing participants from the selected research community college may have demonstrated response bias due to population similarity (Mertens, 2015).

The sampling method may have presented further limitations on the generalizability of results from the study. Convenience sampling was used to recruit

participants for this study (Field, 2013). The convenience sample of participants who take the web-based survey may not represent the entire population of the students at the community college. The descriptive statistics gave some indication of the representativeness of the sample.

Concurrent validity may have also been a limitation within this study (Field, 2013). However, the DAST-10 has demonstrated high concurrent validity in capturing substance use behavior (Skinner, 2001). Response bias may have proposed a further limitation in this study as participants may consciously or subconsciously provide biased responses to the survey questions (Field, 2013). Response bias refers to misleading responses in a research process from inaccurate or truthful responses (Field, 2013). The DAST-10 contains developed markers within the instrument (Questions 4 and 5) to address under or over reporting responses in association to social desirability (Skinner, 2001). The anonymous intent of the data collection in this study will also help to address the challenges of socially desirable bias. Participants knew their privacy and confidentiality is protected to avoid response biases of the participants (Field, 2013). Participants who did not return the assessments generated a nonresponse bias, which reduced the sample size for this study. Nonresponse bias presents challenges to survey research as this limitation may affect the variables at the outcome of the study (Field, 2013).

Significance of Study

During the transition to college, many students begin to use illicit substances to cope with the social pressures and demands of higher education (SAMHSA, 2013). Day

et al. (2013) highlighted the need for drug prevention programs on college campuses among undergraduate students as a means of aiding the students to achieve academic success. Although there is ample research on substance use among students attending four-year colleges in the United States, there is little research on key risk factors for illicit substance use other than alcohol among traditional age (18 to 25 years) students attending community colleges (Arnett, 2014). This study makes a unique contribution to the literature with the examination of risk factors for self-reported substance use other than alcohol among a sample of community college students.

Community college students constitute approximately 33% of the student population (NCES, 2012); therefore, they represent a significant portion of college students who are at risk for drug abuse. Data from the NSDUH (2013) revealed that 17.3% of emerging adults ages 18 to 25 reported they had abused or were dependent on an illicit substance. Consequently, approximately 17% or more of community college students could be expected to engage in drug abuse (NCES, 2012).

This study was significant because results from the study can reveal the scope and magnitude of illicit substance use other than alcohol, and related risk factors, among a sample of community college students. College administrators, counselors, and advisors can use the information to apply for federally funded grants for developing programs that address substance use other than alcohol in the community college setting (U.S. Federal Drug Enforcement Administration, 2015). Such information can be useful to college counselors and other college leaders to advocate for and promote the need for drug abuse prevention and education programs at community colleges in the United States, including

those that might target students with identified risk factors. Such programs could benefit students, the larger academic community at 2-year institutions, and society by educating students on the variables that influence substance use other than alcohol. The educational programs can also inform students of the maladaptive behaviors associated with illicit substance use such as diminished cognitive capacity (Kanel, 2009), poor academic performance (Whitten, 2014), and diminished daily living skills (Day et al., 2013). In turn, the substance use and prevention programs could lead to positive social change by reducing rates of substance use other than alcohol among community college students (SAMSHA, 2014) and enabling the students to become productive members of society.

Summary

Social science research on substance use other than alcohol among adults has witnessed the significant increase in the human services field (Arnett, 2014). The lack of social well-being and social acceptance among emerging adults 18 to 25 may lead to profound maladaptive behaviors of substance use other than alcohol on a community college campus (Arnett, 2014). Relationships between developmental and sociocultural factors and maladaptive behaviors of substance use have been noted among undergraduates in 4-year colleges (Kristin, 2010). Therefore, I conducted this study to respond to a gap in understanding: Are findings among 4-year college students applicable to community college students or are other developmental and social factors at play for community college students' substance use?

In Chapter 2, I provide an in-depth review of the literature on the developmental and social differences of age, ethnicity, gender, sense of autonomy, social relationship

with others, and the prevalence of substance use other than alcohol among emerging adults 18 to 25. I also provide literature on the conceptual foundation of social learning, emerging adults, and the association of sense of autonomy and social relations with others among emerging adults on college campuses. Finally, I synthesize the conceptual research of emerging adults and the social behaviors of recreational substance use other than alcohol among students at a Mid-Atlantic community college.

Chapter 2: Literature Review

Introduction

According to the SAMSHA (2014), drug abuse among college students increased by 40% from 2010 to 2013. Other researchers have revealed an increase in the illicit use of nonmedical prescription painkillers and other illegal drugs other than alcohol among the undergraduate college student population in the United States (Hu et al., 2011; Kristen, 2010; Whitten, 2014). Scholars have revealed a link between drug abuse and variables such as age, gender, sense of autonomy, and the nature of an individual's relationships with others (Hu et al., 2011; Kristen, 2010; Whitten, 2014). Additionally, variables such as ethnicity, personal desire for self-sufficiency, the need for peer acceptance, and social environments that condone the use of drugs are related to substance use among undergraduate college students (Arnett, 2014; Kristen, 2010; Pope et al., 2014). Substance use other than alcohol among college students is a problem because the immediate and continual effects of drug use contribute to diminished cognitive processes (Khan et al., 2015) and impaired psychomotor skills (Whitten, 2014). Excessive substance use other than alcohol also affects students' ability to perform daily tasks that are necessary for both academic success and social actualization (Day et al., 2013). Age, ethncity, gender, sense of autonomy, and the nature of an individual's relationships with others are related to drug abuse among undergraduate students attending 4-year colleges (Areheart-Treichel, 2014; Arnett, 2014; Hu et al., 2011; Kristen, 2010; Pope et al., 2014). However, nonmedical prescription painkiller abuse is not limited to a specific age, ethnicity, or gender within postsecondary education

(McCabe, Boyd, & Teter, 2009). Many students who attend 4-year institutions engage in recreational drug use for peer and social acceptance, specifically within academic groups such as sororities, and fraternities (McCabe et al., 2014). The social affiliations on 4-year institution campuses help establish a student's identity at a time when he or she is trying to adjust for academic achievement in higher education.

Although there is an abundance of research on the variables related to drug abuse among traditional aged (i.e., 18 to 25 years) students attending 4-year institutions, there is a gap in the research on the social and developmental variables that contribute to substance use other than alcohol among students attending 2-year institutions in the United States (Theron & Liebenberg, 2015). The purpose of this study was to examine the correlation in the self-reported drug abuse other than alcohol among a sample of community college students with demographic variables and personality variables, including autonomy and social needs. Such information could be used to determine the need for and to advocate for drug abuse education and awareness programs at the community college level. The results of this study contribute to the body of literature on substance use in the community college student population.

In this chapter, I explore the historical research on substance use; the background of substance use among undergraduate college students; and social and developmental differences related to the variable such as age, ethnicity, gender, and self-sufficiency among community college students. I also discuss the theoretical framework that was used to guide this study. I then review the literature concerning the prevalence of

substance use among emerging adults at the college level as well as the developmental and social variables related to substance use behavior.

Literature Search Strategy

I conducted a digital search of empirical and peer-reviewed literature through databases such as Academic Search Complete, EBSCOhost, ProQuest Criminal Justice New Platform, ProQuest, PsycINFO, PsycARTICLES, Sage, and SocIndex. The primary search terms I used to locate relevant literature were *emerging adults, drug abuse, substance use, illicit drug abuse, community college drug abuse, college drug abuse, gender drug abuse, ethnicity, African American drug abuse, Caucasian drug abuse, prescription painkiller, nonmedical prescription painkillers, social development,* and *social acceptance.* I also obtained literature from printed versions of relevant articles, books, and reports from the last 5 years.

Conceptual Framework

The conceptual framework for this study was grounded in social learning theory and the theory of emerging adulthood. Social learning theory was originally conceived by Bandura (1977), the emerging adulthood theory was introduced by Arnett (2000), which was grounded in Erikson's (1980) psychosocial theory of development. Bandura's social learning theory and Arnett's emerging adulthood theory help describe human behavior as the progressive development of behaviors that are shaped and mediated by the interplay of self-regulation and social governance during young adult development (18 to 25 years). Additional details of each theory and literature related to each theory follow here.

Social Learning Theory

In the social learning theory, Bandura (1977) emphasized the significance of modeling, which explains the social dynamics of learning that occurs through a method of observation (Arnett, 2014; Berger, 2011). Bandura claimed that most behaviors that people display are learned deliberately or inadvertently through observation of influential models. Bandura revealed the significance of modeling, imitation, and observation as influential factors of learning and behavior. In applying Bandura's theory, researchers have provided insights for the administrators of higher education institutions regarding the social influences that contribute to drug abuse behavior among college students (Peralta & Steele, 2010). Bandura's social learning theory can be used to explain how social and cultural norms influence the development of undergraduate college students during the first 2 years of college (Arnett, 2014; Maahs, Weidner, & Smith, 2016; Peralta & Steele, 2010). The social learning theory can also be used to address how peer associations influence maladaptive behaviors, such as nonmedical drug abuse among undergraduate college students (Arnett, 2014). Scholars have examined relationships between principles of social learning theory and drug use/abuse.

The theoretical ability to describe and explain an individual's development of learning within society is through Bandura's (1977) social learning theory; this theory is used to understand sociocultural norms and developmental influences within the first two-years of higher education (Peralta & Steele, 2010). Social learning theory aids social science research in the behavioral and cognitive changes and influences within the environment, which contributes to educational knowledge of recreational nonmedical

substance use behavior and peer associations in academia (Arnett, 2014). Continual research and application of Bandura's theory has provided insight to administrators of higher education instructions regarding social influences that contribute to constant drug abuse behavior among college students (Peralta & Steele, 2010).

According to Peralta and Steele (2010), the principles of social learning theory of learning and modeling contribute to long-term substance use. Peralta and Steele conducted a study to determine the associations between lifelong nonmedical prescription drug abuse and the following three aspects of the social learning theory: (a) differential association, (b) imitation, and (c) differential reinforcement. The sample for the study consisted of 465 male and female undergraduate students over the age of 18 at a Midwestern University (Peralta & Steele, 2010). The self-administered online survey was designed to include a series of indicators consistent with the components of the social learning theory. Findings from the study revealed that the average age for nonmedical prescription drug abuse was 18, 39% reported use at least once in their life due to peers, and 31% used within the last year with continual use due to peer acceptance (Peralta & Steele, 2010, p. 880).

Undergraduate learners engage in recreational drug use for peer acceptance, which is seen as normal behavior due to peer pressure during adolescence (Theron & Liebenberg, 2015). Many young adults have self-disclosed initial recreational substance use with a sibling or peer. Reviewing data from 525 male and female students regarding their perceptions of socially acceptable behavior related to drug abuse, Theron and Liebenberg (2015) identified a positive correlation among 32% of the participant

population with the predictive variable of a number of siblings' correlative to the social learning factor of imitation. There was also a strong significance in behavioral imitation among peers when social acceptance of drug abuse occurs (Theron & Liebenberger, 2015). Research has indicated that initial onset of recreational substance use among undergraduates is during the first year of postsecondary education as delinquent peer imitation (McCabe et al., 2014).

Substance use behavior among undergraduates is associated to peer maladaptive behaviors (Maahs et al., 2016). Maahs et al. (2016) revealed a 90% probability of prescription drug abuse among participants who identified delinquent behaviors due to peer influences. Watkins (2016) showed that 12% of the participant population identified nonpeer prescription painkiller use, and 87% of those individuals indicated that some of their friends' misuse prescription painkillers. Researchers have supported the social learning aspect of drug abuse in which peer association of prescription drug misuse was associated with favorable acceptance and reinforcement of prescription drug misuse among peers.

Emerging Adulthood Theory

Emerging adulthood theory was first introduced by Arnett (2000) as a new conceptualization of the growth and development that occurs in individuals during ages 18–25. Arnett's theory is predicated upon Erikson's (1980) theory of psychosocial development. According to Erikson, individuals focus on establishing a sense of identity within society by mastering social relationships during each transitional stage of development. In the psychosocial development theory, Erikson placed emphasis on

specific stages during development. Arnett expanded Erikson's theory by identifying the critical stages of development that occur during the transition from late adolescence into young adulthood. Arnett's research was focused on the social, cultural, and peer influences during development that transcended into imitation stressed. According to Arnett (2014), risky behaviors such as drug abuse are normative during the transitional stage from adolescence into young adulthood. On average, students increasingly are exposed to illicit drugs through peer associations and influences they encounter after entering college (Watkins, 2016). Therefore, the emerging adulthood theory, which addresses changes that occur during the transitional period from the teens to the 20s, supports this study because the theory addresses the social factors that influence behavior during the transitional period.

Arnett (2014) defined emerging adulthood as an individual's development during the early to late 20s, which consists of the following stages: exploration of self-identity, establishing self-focus, and succumbing to the pressure of environmental influences. Learning from environmental models reinforces the psychological, behavioral, and acceptance of social perceptions, which contributes to the development of sociocultural behaviors during young adulthood development (Arnett, 2014). I will use the principles of emerging adulthood theory in this study to explain the relationship between the variables that contribute to the maladaptive behaviors of drug abuse among college students attending community colleges in the United States.

Emerging adulthood theory has also provided a conceptual framework for previous studies focused on relationships between substance use and social influences.

For example, Ungar, Liebenberg, Dudding, Armstrong, and Van De Vijver (2013) reported that undergraduate learners engage in recreational drug abuse as a means of eliciting peer acceptance. Ungar et al. assessed 497 participants to measure resilience and prosocial activities among young adults. Findings from the study revealed a strong significance in resilience among peer relationships when social acceptance was demonstrated through maladaptive behaviors of nonmedical prescription drug use during the transition from adolescent to young adulthood (Ungar et al., 2013). Additionally, McCabe, Teter, and Boyd (2016) revealed an increase of nonmedical prescription drug use among young adults with peers transitioning into young adulthood when social acceptance of substance use behavior was present.

Recreational substance use is a maladaptive behavior among young adults. According to Kelley, Graybeal, and Mahoney (2013), deviant and maladaptive behaviors of drug abuse are socially acceptable among young adults. The peer observation and imitation of socially acceptable drug abuse behaviors among emerging adults has contributed to drug abuse and dependency within the last decade (Arnett, 2014; Kelley et al., 2013). Kelley et al. (2013) revealed that 2,200 undergraduate predominately European American male students at five college universities looked forward to spring vacation to drink, abuse nonmedical prescription drug use, and have fun with their peers as normal and socially acceptable behavior. According to Schinke, Schwinn, Hopkins, and Wahlstrom (2016), more than 40% of recreational opioid abusers are predominately under the age of 25 with peer influences of recreational drug abuse. Schinke et al. revealed that 2,940 male and female undergraduates predominantly under the age of 21 at

five college universities looked forward to campus social settings to drink and abuse nonmedical prescription drug use with their peers as normal and socially acceptable behavior. Research reflects the increased recreational abuse of substances among young adults (ages 18 to 25). The research also demonstrates the social acceptance of the maladaptive behavior when peer association is present for the imitation of substance use other than alcohol.

The socially acceptable behavior of recreational substance use other than alcohol accounts for the surge in fatalities related to this substance use. Researchers have revealed an increase in drug abuse among 18 to 25-year-olds in the United States (CDC, 2015; Kelley et al., 2013; Schinke et al., 2016; Ungar et al., 2013). Principles from Bandura's (1977) social learning theory and Arnett's (2000) emerging adulthood theory can be used to explain how observation, imitation, and peer influences can serve as sociocultural variables that influence substance use other than alcohol in individuals entering the period associated with emerging adulthood. There is an association between young adult maladaptive behavior of drug abuse and peer association (Arnett, 2014; Ungar et al., 2013). Among young adults (ages 18 to 25), the transitional period of development presents challenges of peer association, which contributes to peer imitation for the recreational use of substances other than alcohol. Exploring young adults' perceptions of self and peer associations may determine imitations of maladaptive substance use behavior among young adults.

Historical Overview of Substance Use

The era of opioid abuse began in the 19th century when physicians began providing medicinal forms of opium to patients as a treatment for food poisoning and other gastrointestinal problems (National Institute on Drugs, 2016). The medicinal use of opium that contributed to dependency initially began in White middle-class housewives who were self-medicating to combat physiological and psychological problems (Renner & Levounis, 2011). At that time, the daily dependency on opiates among housewives correlated with medicinal behaviors rather than the criminal behaviors linked to drug abuse in the 21st century (Renner & Levounis, 2011).

The perception of such drug use as a beneficial medical treatment practice for physiological and psychological problems led to the term *soldier's disease* and society's acceptance and understanding of medicinal opium use among a population of addicts (Renner & Levounis, 2011). However, the increase in Chinese immigrant laborers within the United States who engaged in the medical use of opium for chronic pain altered society's perception of opium use and thus contributed to addiction (Kandel, 2002). By the mid-1900s, there were more than 250,000 opiate addicts in the United States (Renner & Levounis, 2011). Approximately 20% of the opium-addicted population was under the age of 30 (Renner & Levounis, 2011). This phenomenon contributed to the passage of the 1914 Harrison Narcotic Bill, which controlled the dispensing and distribution of narcotics over-the-counter and by physicians to minimize the progression of addiction from opium abuse (King, 1952; Redford & Powell, 2016). The federal policies and procedures of

illicit substances did not decrease substance use but developed a maladaptive behavior defined by society as substance abuse.

The historical progression of opium defined the criminalization of recreational drug abuse as maladaptive and deviant behavior (Fagan et al., 2007). During the 1800s, the medicinal use of opium produced as heroin in a prescribed pill form to address pain began the development of the term *illegal drugs* before the 1914 Harrison Narcotic Act (King, 1952). The human consumption of the medicinal from of opium produced unintentional psychological and physiological maladaptive behaviors due to unknown opium potency (Kristen, 2010). The recreational use of the synthetic and semisynthetic opium forms of prescription painkillers established the social perception of deviant behavior (Redford & Powell, 2016). The increased social desirability and novelty of the illegal drugs led to the first federal law of nonmedical prescription painkillers defined as the Harrison Narcotic Act 1914 (King, 1952; Redford & Powell, 2016).

The continual social desirability for the illicit forms of drugs established a maladaptive culture of recreational drug abuse through social learning (Renner & Levounis, 2011). Social learning occurs through sociocultural influences of an individual modeling, observing, and imitating others or peers (Bandura, 1977). Significant developmental influences and associations in recreational drug abused among young adults 18 to 25 has contributed to the present research of substance use among young adults by age, gender, and ethnicity (Arnett, 2014 Arria & DuPont, 2010).

Prevalence of Substance Use Among Young Adults

Society continues to underestimate or even excuse the abuse of nonmedical prescription drug abuse by young adults between the ages of 18 and 25 (Arria & DuPont, 2010). Previous research has indicated that on average, young adults between the ages of 18 and 25 who are in the inner city have 40% greater access to illicit substances than individuals living in more rural areas (American Association of Community Colleges, 2010). Gainful access to nonmedical prescription painkillers increases recreational drug abuse by 60% among young adults (Arrina & Dupont, 2010). Greater than 47% of Mid-Atlantic colleges and universities are in the inner-city allowing greater accessibility of nonmedical prescription painkillers among young adults (College Board Trends in Community College, 2016). According to Chiauzzi et al. (2011), substance use among undergraduates is associated with accessibility through peer engagement and socialization.

Location and access are factors that lead to increased nonmedical prescription drug abuse by young adults. Rigg and Monnat (2014) conducted a web-based quantitative study to examine prescription opioid misuses among young adults 18 to 25 years in an urban inner city and a rural location, focusing on the level of drug abuse among young adults and accessibility to nonmedical prescription painkillers. Their results showed that the prevalence of prescription opioid misuses increased dramatically during the last decade by 55% in both urban inner city and rural geographical locations. Further, the illicit misuse of nonmedical substances was more prevalent among urban adults by 64% than rural adults at 36% due to factors such as greater mobility and the increased access

to illicit substances in more highly commutable locations (Rigg & Monnat, 2014). Arria and DuPont (2013) also expressed the significant difference in substance use among inner-city young adults by 20% versus rural young adults, supporting the increase of substance use among young adults in association to accessibility of illicit substances.

Other factors aside from location may influence substance use among young adults in college. Hu, Primack, Barnet, and Cook (2011) conducted a quantitative study to address drug abuse in academia regarding drugs other than alcohol. They administered a web-based survey to undergraduate students who had less than 2 years of attendance in higher education, conducting a multivariate regression analysis of sociodemographic information such as gender, ethnicity, relationship with others, and first or second year of college attendance identified (Hu et al., 2011). The purpose of the study was to determine the associations between the demographic variables and self-reported drug abuse other than drugs (Hu et al., 2011). Research has revealed high rates of substance use among peers with associations of less than a year (Chiauzzi et al., 2011). Hu et al.'s findings showed that more than 8% of participants self-disclosed the recreational abuse of drugs other than alcohol with first-time peer associations.

According to the College Board Trends in Community College (2016), first-time criminal offenses among campuses students have doubled within the last year in association to substance use. The College on Problems of Drug Dependence continually researches the epidemic of drug use or abuse challenges on college campuses to develop effective drug polices, and intervention programs (Zacny et al., 2013). The epidemiology data concerning drug use and abuse collected by the College on Problems of Drug

Dependence demonstrated an increase by 40% in nonmedical opiate use among young adults aged 18 to 25 (Zacny et al., 2013). Greater than 40% of the research population attended less than 2-years of college. The data also demonstrated participants with first-time criminal offenses engaged in maladaptive substance use behavior with a peer association with less than a year (College Board Trends in Community College, 2016; Zacny et al., 2013). The participant data supported the need for policy development and risk management strategies to reduce the use, abuse, and distribution of nonmedical substances on college campuses.

Research has indicated that nonmedical prescription stimulant abuse may be related to social settings. Nuckols et al. (2014) considered the social myths, beliefs, and behaviors related to college drug abuse among young adults, conducting web-based surveys among four Midwestern colleges to determine drug abuse perceptions and social settings. According to Ferrer, Marks, Midarsky, and Hutz-Midgett (2015), young adults attending college substance abuse is greatly associated with social events near or on college campuses. Nuckols et al. revealed that 61% of the female participants reported they engaged in recreational drug abuse on greater than five occasions during college social settings. Less than 40% of the participant population stated nonuse of illicit drugs during college social settings but the engagement of alcohol consumption to avoid peer rejection (Nuckols et al., 2014).

Prevalence of Substance Use among College Students

Community college students constitute approximately 33% of the student population (NCES, 2012), and they represent a significant portion of the college students

who are at risk for drug abuse. Data from the NSDUH (2013) revealed that 17.3% of emerging adults aged 18 to 25 abused or were dependent on an illicit substance. Consequently, approximately 17% or more of community college students could be expected to engage in drug abuse (NCES, 2012).

Research has shown that it is during the transition to college that many students begin to use drugs to cope with the demands of higher education. Arria and DuPont (2010) conducted a longitudinal study on drug use behavior among first-year students college students after they transitioned into the first year of college. This supports Arria et al. (2017), who revealed an increase in substance use within the Mid-Atlantic first-year college experience. In their research, Arria and DuPont found that 34% of the undergraduate population was using drugs within the first semester of enrollment. Greater than 60% of the participation population reported engaging in recreational drug abuse during the second semester of the enrolled freshman year (Arria & Dupont, 2010). Arria et al. also presented the significance in peer imitation through peer observation during social college events. They concluded that a significant construct in peer imitation is social learning, an associating factor in the continual drug abuse behavior among undergraduate students (Arria et al., 2017). Arria and DuPont also emphasized the significant need for poly-substance education and prevention programs to address the continual drug use behavior and unintentional addiction of college students.

Other research has revealed an increase in the illicit use of nonmedical prescription painkillers and other illegal drugs among the undergraduate student population (Hu et al., 2011; SAMHSA, 2014). More than 50% of the enrolled

undergraduate population has recreationally used opioid drugs (SAMHSA, 2014). The increased primary illicit drug use is among young adults during higher education social events (Hu et al., 2011; SAMHSA, 2014). Prescription drugs such as oxycodone, hydrocodone, and Xanax are common on college campuses as an enjoyable method of relaxation and socialization. Hu et al. (2011) analyzed with a bivariate multiple linear regression analysis with a test retest Cronbach's alpha of .73 prescribed prescription use for recreation, and .68 antisocial attitudes indicating higher peer delinquent behavior due to the acceptance of nonmedical prescription drug use. Those who used prescribed pain-relieving narcotics developed a rapid tolerance for addiction, resulting in the increased percentage of drug abuse among undergraduates on college campuses (Hu et al., 2011). Additional research of recreational drug abuse other than alcohol demonstrated a 52% in nonmedical prescription painkiller abuse among college students (Hu et al., 2011; McCabe, Boyd, & Teter, 2014).

Research has also shown that polysubstance abuse may be more prevalent among those who use nonmedical prescriptions. McCabe et al. (2014) conducted a quantitative study to compare nonmedical users of prescription stimulants to other types of drug users regarding self-reported drug use. McCabe et al. used a web-based survey, including a modified version of the DAST-10, on a sample of first-year undergraduate students at a large public Midwestern 4-year university to measure self-reported substance use, substance misuse, and abuse other than alcohol. Results from the study revealed that 62% nonmedical users of prescription stimulants were more likely than other drug users to report polysubstance use (McCabe et al., 2014). According to the NSDUH (2015),

polysubstance use among emerging adults has increased by 20%. The maladaptive behavior of polysubstance use is a socially acceptable behavior due to peer acceptance. McCabe et al. stated that nonmedical users of prescription stimulants were also more than 4 times more likely than other drug users to have experienced three or more drugs in the past 12 months.

Bavarian, Flay, Ketcham, and Smit (2015) also assessed the prevalence of nonmedical use of prescription stimulants and analgesics, examining a sample of 1,253 first-year college students aged 17 to 20 who attended a large public university. The meta-analysis of peer-reviewed studies from 2000 to 2013 revealed a significant increase of polysubstance illicit drug abuse among college students. Findings from the study revealed the lifetime and past-year prevalence of the nonmedical use of stimulants, analgesics, or both: analgesics and stimulants were used by 19.6% of the students over lifetime and 22% for the past year; lifetime use of analgesics was 21.6% and usage for the past year was reported at 17.5%; and there was reported lifetime usage of stimulants by 15.6% of the students, and 22.3 % reported usage during past year (Bavarian et al., 2015).

According to the NSDUH (2015), polysubstance use among emerging adults has increased by 30%, with a 15% increase of illicit use among community college learners due to peer influence and for peer acceptance. The study's statistical analysis of three influences, age, social acceptance, and peer relationships with four causations, age, gender, race, sociodemographic location of college demonstrated a significant correlation in 62 studies in association to substanceas abuse among undergraduates (Bavarian et al.,

2015). Although the data demonstrated a need for continual research of drug abuse in college undergraduates, no future studies have been stated (Bavarian et al., 2015). However, Bavarian et al. (2015) addressed the significance in greater accessibility to the socially influenced illicit substances, which deems the need for traditional 4-year and 2-year college demographic drug abuse behavior research, specifically among 2-year institutions that transition into 4-year institutions for the obtainment of a confirmed undergraduate degree.

Prevalence of Substance Use Among Community College Students

Opioid drug use and abuse among emerging adults between the ages of 18 and 25 who attend community colleges is a developing public health concern (American Association of Community Colleges, 2016). The public health epidemic of opioid use, overdose, and induced death among the community college emerging adulthood population 18 to 25 years old has created great concern among community colleges' administration, faculty, and staff (Chiauzzi et al., 2011). More than 40% of all community college administrators, faculty, and staff express significant concern regarding community college learners' drug use (Community College Research Center, 2016). The American Association of Community Colleges National statistics revealed an 11% increase in drug abuse on community college campuses within the last 3 years (Chiauzzi et al., 2011).

Learners who commute to a nontraditional community and technical colleges are exposed to significant social influences relating to drug abuse (Hu et al., 2011). Hu et al. (2011) conducted a qualitative study at 23 community and technical colleges, identifying

the social influences of peers a drug accessibility as accounting for the 23% increase in self-reported drug abuse among college students who attend a nontraditional educational institution as an undergraduate. Hu et al. also considered sociodemographic characteristics such as the rural, or inner-city location of the college to determine a demographical progression in drug abuse among inner-city or rural college students. The findings of the study showed a 33% increased use and abuse of recreational drugs among college students regardless of their college's location within the last 2 years, which is a further indication that the problem constitutes a public health epidemic (Hu et al., 2011). Substance use continues to increase among first-year students, specifically within the inner-city campuses social events despite clinical perception of maladaptive behavior.

The accepted maladaptive behavior of substance use more typically seen in social settings has now transcended into academic environments (Cicero et al., 2014). According to Cicero et al. (2014), the recreational use of prescription painkillers is as socially acceptable as smoking cannabis or nicotine on college campuses. The maladaptive behaviors associated with recreational drug abuse is greatly associated with peer acceptance and the fallacy of social well-being. Cicero et al. explored past drug use patients' behavior entering treatment with collected qualitative data from $N = 54$ undergraduate student drug abuse for a correlational analysis and revealed a significant association in recreational drug abuse and peer acceptance. Recreational prescription painkiller use is socially acceptable among young adults with a higher rate of nonmedical prescription painkiller use versus alcohol (Branson, Sanford, Dasgupta, Graham, & Lovette, 2011).

An increase in the use of opioids among emerging adults in academic settings like community colleges is becoming a concern (American Association of Community Colleges, 2016). For instance, Schepis, West, Teter, and McCabe et al. (2016) revealed that the ingestion of nonmedical tranquilizers and other recreational psychoactive substance use has increased among young adults. The illicit substance use among college students has increased by 31% since 2000 (Schepis et al., 2016). The increased use of marijuana demonstrates a 22% leverage in illicit drug abuse over prescription painkiller use (NSDUH, 2015; Schepis et al., 2016). The increased use of the nonmedical pain relievers hydrocodone and oxycodone included a 58% greater use among male community college student (Schepis et al., 2016). Caucasian males between the ages of 18 and 29 reflect the highest population of nonmedical prescription drug abuse on community college campuses (Schepis et al., 2016). Ethnicity, age, and gender in criminal., maladaptive behaviors, and fatalities attributed to drug abuse is distinctively significant in higher education (Zacny et al., 2013).

Consequences of Substance Use among College Students

Research has shown an increase in the illicit substance use is on the rise for prescription painkillers among young adults who engage in recreational use with their peers (CDC, 2015). Such drug use is related to several negative outcomes: decreased academic performance, noncompletion of academic programs, (Arnett, 2014; Hart, 2012; Kandel, 2002), premature death, and long-term addiction (Kristen, 2010). These outcomes attribute to costs for society (Birnbaum et al., 2011; McCabe, West, Christian,

& Boyd, 2014; Center for Behavioral Health Statics and Quality [CBHSQ], 2015; Larochelle, Liebschutz, Zhang, Ross-Degnan, & Wharam, 2016).

According to Kristen (2010), opium-based drugs are organic substances with psychoactive compounds that produce euphoria and desire of continual use by undergraduate learners. The manufactured compounds pharmacologically defined as synthetic and semisynthetic opiates/opioids foster addiction (Kristen, 2010). Neurological and pharmacological studies have shown that psychoactive substances cause damage to the central nervous system, which is composed of the brain and the spinal cord (Fraser, 2011; Kristen, 2010). Research has linked the continual recreational use of psychoactive substances to negative outcomes such as reduced cognitive competence and induced behavioral maladaptation, both of which can affect a college student's academic performance, development, and social well-being (Kristen, 2010; White at al., 2014).

McCauley et al. (2010) conducted a quantitative study to determine the impact of nonmedical prescription drugs on student academic performance. The nonmedical drug users had significantly lower GPAs in high school when compared with nonusers; in college, they skipped classes more often, spent more time socializing, and spent less time studying (McCauley et al., 2010). For example, nonmedical drug users of both stimulants and analgesics skipped 21% of their college classes, whereas nonusers skipped only 9%. While controlling for high school GPA and other factors, past-year nonmedical drug use independently predicted a lower college GPA by the end of the first year of college, with a predictive factor of more skipped or missed classes (McCauley et al., 2010).

Hart (2012) also reported on links between use of recreational drugs and declines in undergraduate students' academic performance. Studying 2,323 undergraduate students, Hart found a link between drug abuse and class attendance. More than 68% of the participant population missed at least one class per week due to recreational drug abuse, and more than 30% of the participant population reported missing more than two classes weekly with increased recreation drug abuse (Hart, 2012).

The damage caused by recreational drug abuse contributes to the difficulty involved in the successful completion of certificate and transitional programs (Arnett, 2014; Kandel, 2009). Day et al. (2013) conducted a web-based survey using the American College Health Association/National College Health Assessment on drug abuse behavior among 1,876 undergraduate college learners. Day et al. found a significant link between drug abuse, diminished cognitive processes, impaired psychomotor skills, and maladaptive daily living skills. Approximately one out of 14 undergraduates reported negative outcomes related to using illicit drugs-with an average of one out of 10 reporting a deviant behavior for social acceptance. For example, recreational drug abuse was related to maladaptive daily living skills, unhealthy social well-being, and decreased academic success (Day et al., 2013).

Recreational drug use can also lead to fatalities. Data from the CDC (2013) revealed that an average of 44 individuals die per day due to prescription painkiller abuse, which equates to over 16,000 opioid-related deaths in the United States per year. Whitten (2014) stated that seven out of 10 deaths per week among young adults 18 to 25 were due to drug overdose. According to the 2013 public health statistical report, the

number of prescription-related drug abuse deaths exceeded the number of deaths related to alcohol, cocaine, and motor vehicle accidents (Whitten, 2014). The increased number of deaths has made prescription drug abuse a national epidemic and a public health issue that should be addressed by education and prevention strategies.

Nonmedical drug overdoses and mortalities have increased at an alarming rate (Wermeling, 2015). The number of deaths related to overdoses from the nonmedical use of prescription painkillers increased 1.5 to 5.1 per 100,000 people from 2010 to 2013 (CBHSQ, 2015; Larochelle et al., 2016). The socioeconomic status of the illicit substance fatalities has also changed dramatically due to the route of administration and accessibility (CBHSQ, 2015). On average middle-class young Caucasian adults between the ages of 18 to 25 engage in the inhalant recreational use of nonmedical prescription painkillers greater than other ethnicities CBHSQ, 2015).

According to Rigg (2015), the sociocultural factors associated with drug abuse have changed based on the increased usage and distribution of prescription painkiller opioid/opiate derivatives in the abused form of heroin. In Rigg's (2015) study, more than 20% of the participants self-disclosed crushing the pill form of the prescription painkiller to make it suitable for nasal inhalation. The research statistics illustrate the significance of drug abuse behavior among emerging adults and the need for unique intervention strategies among this population (Rigg, 2015). Testing for past-year prescription painkiller misuse among emerging adults, the NSDUH (2013) revealed a 24.9% increase of prescription painkiller opioid/opiate abuse among young adults 18 to 25 (Rigg, 2015).

The findings of the study indicated that prescription painkiller misuse is more prevalent among emerging adults than other age groups.

The CDC made a public health announcement that linked the nonmedical abuse of opioids/opiates to more than 70% of all drug-induced overdoses and/ deaths in 2014. The increased methods and routes of drug administration injectable, nasal, and subcutaneous means have exuberated the recreational drug abuse of opioids/opiates, especially among young adults (CDC, 2015a). Research has shown an increase in the illicit use of prescription painkillers by young adults who engage in recreational use with their peers (CDC, 2015a). On average, more than 52% of enrolled college students self-disclosed recreational drug abuse among peers in academic settings supporting the severity of the educational and financial need to counteract the drug abuse epidemic in the United States on college campuses (CDC, 2015a).

The economic burden associated with the increased abuse of prescription painkillers and heroin is estimated to be over $55 billion, resulting in a multitude of intervention and prevention strategies within the United States (Birnbaum et al., 2011; McCabe et al., 2014). A prevention cohort study of emerging adults identified as having a substance use disorder revealed a 33% increase in the student affairs overtime hours and referrals to community resources for treatment (Smith, Davis, Ureche, & Dumas, 2016). According to Smith et al. (2016), the under-researched substance use disorder population among emerging adults extends beyond the budgetary resources provided for mental health and substance use disorder allotment. Smith et al. stated that less than 20% of the

community, 2-year, or technical colleges have identified a financial means for prevention programs to address the drug abuse epidemic among emerging adults 18 to 25.

Research on recreational drug abuse among emerging adults 18 to 25 attending higher education institutions has demonstrated an abundance of sociocultural challenges, consequences, and fatalities (Arnett, 2014; CDC; 2015a; White et al., 2014). Sociocultural research on age, ethnicity, and gender of drug abuse explores the association of self-autonomy and positive relationships with others among emerging adults as developmental influences in community college recreational drug abuse.

Social Factors Related to Substance Use

Several studies have identified various sociocultural factors that are related to substance use other than alcohol in college students (Arnett, 2014; Hu et al., 2011; Schepis et al., 2016; Whitten, 2014). Among those sociocultural factors are variables such as age, ethnicity, and gender. Each sociocultural factor contributes to the development influences of drug abuse among emerging adults 18 to 25. For example, Pilkinton and Cannatella (2012) conducted a quantitative web-based survey to investigate the use of nonmedical Ritalin by age groups. The participants (N = 164,870) provided data on various factors such as age, ethnicity, gender, level of education, and substance use within the last year. Concerning nonmedical Ritalin abuse, 4.0% and 4.7% of 12th graders and college students, respectively, admitted to abusing the drug. Additional variables correlative to socioeconomic status were included in determining social acceptance and social actualization within the five age groups. The correlative variables were significant predictors regarding the ability to purchase drugs and recreationally

engage in the abuse of nonmedical prescription drugs. Pilkinton and Cannatella's findings demonstrated the significant abuse of prescription drugs among transitioning adolescents into higher education and young adults between the ages of 18 and 25 who had the educational designation of undergraduate. Substance abuse among developing adolescents demonstrates an increased risk among transitioning adolescents into higher education and young adulthood (Eversman, 2015).

The National Institute of Health conducted a survey on behalf of the NSDUH to ascertain the prevalence of drug abuse among various age groups (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 2013). Data were collected using a web-based survey with participants in five age groups (12 to 17, 18 to 25, 26 to 32, and 33 to 49, and 50 and older). Participants 18 to 25 demonstrated the highest use of nonmedical prescription drug use (Bachman et al., 2013). The researchers also found that 10.5% of 12th graders and 7.5% of college students indicated they had used Vicodin for nonmedical purposes during the past year. Bachman et al.'s (2013) results showed an increase in nonmedical prescription painkiller use of almost 5% from 2002, with a correlation of peer influences and social environments as contributing factors to young adult substance use.

A recent qualitative research study by Arnett (2014) also indicated a link between social variables, including influential peers, overall social environment, and the increased rate of drug abuse among young adults aged 18 to 25. According to Arnett, young adults aged 18 to 25, who are still developing their social and interpersonal relationships, tend to seek validation and acceptance through peer association and assimilation of recreational

drug abuse. Cicero et al. (2014) also presented a correlation of interpersonal relationships and recreational substance use. A participation population with an average age of 21 from five colleges demonstrated recreational drug abuse as normal recreational social behavior (Arnett, 2014). On average European males with an average age of 21 tend to engage in maladaptive drug use behavior greater than African Americans, Hispanic Males, and all males who identify as Other National Institute on Drug Abuse, 2014). Recreational drug abuse among undergraduates 18 to 25 demonstrates learned sociocultural influences, which present differences among gender and race (Arnett, 2014; Eversman, 2015; Fagan et al., 2011).

Ethnicity

Research has demonstrated racial/ethnic differences in drug abuse among college students. Prior research by Teter et al. (2006) revealed statistically significant gender and ethnic differences in the rate of drug abuse among college students. More than 50% of college students who engage in nonmedical prescription drug use have been shown to be European American males between the ages of 18 to 25 (Johnston et al., 2014; Teter et al., 2006). Nonmedical prescription drug use among females' accounts for 22% on college campuses identifying most nonmedical prescription drug use among males (Fagan et al., 2011).

African Americans. According to Johnston, O'Malley, Bachman, Schulenberg, and Miech (2014), African American youth engage in licit and illicit drug use as acceptable behavior among their peers for social acceptance. Johnston et al. conducted an exploratory, quantitative study of inner-city college undergraduates to determine the rate

of recreational abuse of illicit substances. The exploratory data revealed that drug abuse among African Americans occurred through the social introduction among peers (Johnston et al., 2014). Findings from the study showed that the average first-use age of drug use among African Americans was approximately 14 years of age (Johnston et al., 2014). Johnston et al.'s research revealed the average age for illicit recreational drug use was the age of 18, which coincided with entry into higher education.

The average age of a recreational adolescent substance user and ethnicity has demonstrated a difference within the level of substance use (Cotto et al., 2010). The prevalence of illicit drug abuse continues to rise among African Americans in the United States within young adults between the ages of 18 to 25. Eversman (2015) gathered data from a cohort of 200 intake patients awaiting care from a residential treatment facility and found that more than 50% of the newly admitted substance use cases reported abuse of drugs other than alcohol. Eversman demonstrated a 25% increase from previous research supporting a greater African American male opioid drug abuse other than alcohol in 2011. Reboussin et al. (2015) also examined drug abuse among inner-city African American youth, focusing on abuse of pain medication. The participants consisted of 556 African Americans who were interviewed annually starting in the first grade to determine emergent the prevalence of drug abuse and maladaptive social behavior. According to Pilkinton and Cannatella (2012) inner-city African Americans onset of substance use is an average age of 14 due to premature exposure to illicit substances. Reboussin et al. identified age of first-use of nonmedical prescription drug use was 18 years of age. Approximately 47% of African American youth under the age of

14 who engaged in illicit drug use continued the behavior into adulthood and progress on to stronger psychoactive substances due to premature exposure to drugs.

European Americans. Meisel et al. (2015) revealed that approximately 45% of all undergraduate learners who engaged in drug abuse were European American males with an average age of 21. They explored recreational drug abuse among undergraduate students at four Mid-Atlantic colleges (Meisel et al., 2015). Their web-based survey captured demographical data of age, ethnicity, and gender, with the following two research questions related to drug abuse: Do you use alcohol or prescription drugs with your peers and Have you attended at least 2 years of college? (Meisel et al., 2015). Data from the 2010 NSDUH indicated a significant difference in recreational drug use among European American males by 42% versus other ethnicities (Substance Abuse Mental Health Data, 2011). Meisel et al. supported the implications of this data, demonstrating a 30% increase in drug usage among European Americans males between the ages of 18 to 25 within the last 2 years, which shows the significance of drug abuse among undergraduates.

Buccelli, Della Casa, Paternoster, Niola, and Pieri (2016) supported other research findings about ethnic population's recreational drug abuse. They found that European American males are 3 times more likely to engage in recreational drug abuse than Hispanic males, and African American males are more than twice as likely to engage in recreational drug abuse compared to Hispanic and Asian males (Buccelli et al., 2016). Buccelli et al. examined age, gender, ethnicity and two research questions: Have you ever used any form of drugs? How likely are you to use drugs in social settings? They

determined that 36% of the undergraduate population had used some form of a drug with 44% using drugs during social events. More than 40% of the participant population that reported engaging in recreational drug abuse were European American males with an average age of 21, 25% African Americans, 12% Hispanic and less than 10% identified as Other. The research data revealed the significance of drug abuse among undergraduate were predominately European American males. Buccelli et al. also emphasized the significant need for prevention programs to address the continual drug use behavior among students

Schepis et al.'s (2016) multi-stage sampling quantitative study findings also supported other statistical data concerning illicit drug abuse among European American males. European American males represent more than 40% of the enrolled emerging adult population at community colleges (National Institute on Drug Abuse, 2014). A participant population of $N = 345$ undergraduate students completed an online web-based survey to capture drug abuse behavior during the first-year academic experience (Schepis et al., 2016). Approximately 42% of the participant population identified as a European American male under the age of 23 that had engaged in recreational drug use within the first enrolled semester (Schepis et al., 2016). However, the data demonstrated a limitation in the study of the multi-stage sampling strategy due to the complexity of the data analysis that may have demonstrated duplication based upon the sample size. Schepis et al. recommended future research with a simplistic sampling strategy to demonstrate the significance of drug abuse among undergraduates on ethnicity and gender.

Others. According to Katz and Davison (2014), researchers are aware of the harmful effects of the use prescription opiates such as oxycodone, Percocet, and codeine to relieve and suppress pain has on the developing brain. Documented statistics from emergency room visits for drug related injuries and overdoses have further revealed and increased use of illicit substances among individuals in the young and middle adulthood developmental stages (Catalano, White, Fleming, & Haggerty, 2011). However, minimal research has been documented on how the recreational use of psychoactive substances is initiated through social models, social norms, and acceptable antisocial behaviors of individuals who do not identify as U.S. citizens (Katz & Davison, 2014). According to the NCES (2012), more than 23% of the enrolled community college student population identified as other, two, or more races with uncertainty of citizenship. Community college students, including those who identified as other under ethnicity, constitute approximately 33% of the student population (NCES, 2012), representing a significant portion of college students who are at risk for substance use. Data from the NSDUH (2015) revealed that 17.3% of emerging adults ages 18 to 25 abused or were dependent on an illicit substance other than alcohol. Consequently, approximately 17% or more of community college students could be expected to engage in substance use other than alcohol with greater than 10% unidentified as substance use due to uncertainty of ethnicity (NCES, 2012). The data demonstrates the challenges with undergraduates between the ages of 18-25 who identify as other ethnicities within community colleges engaging in substance use other than alcohol.

Gender

Drug abuse among college students is influenced by gender, with substantially more males than females admitting to abusing drugs (Fagan et al., 2011). In an early study of gender and drug abuse, Fagan et al. (2011) conducted a meta-analysis of self-reported drug abuse among undergraduate students (N = 7,829). The data revealed that the levels of male self-reported drug abuse were 45% higher than the levels of female self-reported drug abuse (Fagan et al., 2011; Shah & Siddiqui, 2015).

The CDC (2015) determined that drug abuse triples among females and doubles among males when a mental illness is identified. A longitudinal study conducted from 2010-2014 among 2-year and technical college students 18 to 25 revealed a significant variation in gender drug abuse. The multinomial data analysis demonstrated females as 60% of the participant population engaging in nonmedical prescription painkiller use, 47% as males, and 65% as European American. Although research demonstrates a recent change in mental illness and social variables of gender, ethnicity, and self-autonomy about drug abuse, according to the CDC, a contributing factor in drug abuse among the college student population is peer association, relationships, and the social acceptance of recreational drug use.

Other studies have shown greater recreational drug abuse among males. For example, Rhew et al. (2016) conducted a cross-sectional research study to determine drug abuse by gender. The study was a health community-based longitudinal study of secondary and higher education students during grades 12th through the first 2 years of college. The sample consisted of 12,017 participants, with greater than 40% of the

recreational opioid abusers predominately male under the age of 35. A correlational analysis was conducted in SPSS determining a significant difference in male drug abuse and female drug abuse by 62% among predominately Caucasian male undergraduates. Additionally, Schepis et al. (2016) has recommended further research on drug abuse among Caucasian males between the ages of 18 to 25 to determine a need for additional prevention programs in the community.

Another study supporting greater substance use among males was conducted by Wilkinson, Halpern, and Herring (2016), who used the Center for Epidemiologic Studies Depression Scale to capture the level of depression, substance use, and gender differences among participants aged 13 to 18 years and 19 to 25 years. The analysis of the data was conducted by a linear mixed effect model with covariates of race and ethnicity, as well as educational attainment of both parents and the respondent (less than high school, high school graduate, some college, or college graduate or higher). Although the researchers hypothesized higher levels of female self-medication, the data revealed 62% males and 32% females' self-medication with nonmedical prescription drug use. Wilkinson also identified a need for health screening of mental health and substance use at the same time to avoid the increase in drug abuse primarily among male students.

Developmental Factors Related to Substance Use

Many researchers have identified developmental factors that are related to substance use other than alcohol among college students (Arnett, 2014; Hu et al., 2011; Pope et al., 2014; Whiten, 2014). Among those developmental factors were variables such as sense of autonomy and nature of relationships with others. Findings from a

longitudinal study by Pope et al. (2014) further showed that variables such as a personal desire for self-sufficiency, the need for peer acceptance, and social environments that condone the use of drugs were related to substance use among undergraduate college students.

Sense of Autonomy

The sense of autonomy is a state of independence from others (Feldman, 2014). Theorized by Erikson (1980), an individual's ability to establish identify is through social interactions and stages of development. Caucasian males with low levels of autonomy and a stronger need for the approval of others may have higher levels of self-reported drug use than other groups (Cotto et al., 2010). For example, a quantitative study captured 534 undergraduates' male and female perceptions of sense of autonomy, social groups, and recreational alcohol and drug abuse in an undergraduate psychology course (Cotto et al., 2010). Participants were administered a 20-item assessment analyzed in SPSS with a linear regression analysis. More than 40% of the research participants associated sense of autonomy within social settings as the acceptable engagement of nonmedical prescription drug use among peers. The remaining participant population did not perceive alcohol as a drug identifying a limitation within the study of defining recreational drug abuse among college students. Researchers recommend additional drug educational courses before research study to minimize no language or comprehension challenges within the study. However, the study revealed undergraduates' sense of autonomy was associated with acceptable recreational drug abuse during college campus social settings (Cotto et al., 2010).

According to Lo, Monage, Howell, and Cheng (2013), research on self-autonomy and drug use behavior in social settings is greater when a peer or friend is present. They used a probability-based sample of 5,241 full-time college students who completed the 2010 NSDUH to determine the correlation of recreational drug abuse, self-autonomy and drug abuse among college students (Lo et al., 2013). More than 32% of the participant population who engaged in nonmedical prescription drug use during social settings self-disclosed drug use for peer acceptance. Less than 15% of the participants demonstrated high levels of self-autonomy in social settings without the presents of the desire for peer acceptance. Although the research data using a multivariate data analysis presented a significant association with drug abuse and self-autonomy, peer acceptance was a contributing factor in drug abuse. Lo et al. (2013) demonstrated a greater significance in drug abuse and self-autonomy for peer acceptance in social settings.

Pope et al. (2014) also conducted a study to assess the relationships between senses of autonomy and drug abuse among college students. The quantitative study was conducted at a Mid-Atlantic college campus in a student center forum to address self-autonomy and social group drug abuse on the college campus (Pope et al., 2014). Participants who identified significance in the sense of autonomy demonstrated positive relationships with others and abuse of more than two recreational drugs (Pope et al., 2014). Participants with nonsignificance in the sense of autonomy demonstrated negative relationships with others and less than one drug recreationally abused (Pope et al., 2014). The findings indicated significance in the sense of autonomy and relationship with others in correlation to recreational drug abuse (Pope et al., 2014). However, Pope et al. stated

further research was recommended to explore the significance of self-autonomy, recreational drug abuse, and social acceptance on other college campuses.

Research by Meisel et al. (2015) showed that approximately 45% of all undergraduate learners who engaged in drug abuse were European American males that demonstrated elevated levels of social engagement and uncertainty in self-autonomy. They used a quantitative web-based multivariate analysis of variance (MANOVA) to explore the demographics of age, ethnicity, and gender of 237 undergraduates. More than 43% of the participant population identified as male with a 35% recreational drug abuse and self-disclosed self-autonomy of 22% (Meisel et al., 2015). Research has also demonstrated that males with low levels of autonomy tend to have higher levels of self-reported drug use greater than 27% (Schepis et al., 2015).

Peer Relationships Social acceptance

Peer influences and relationships contribute to recreational drug abuse among undergraduates ages 18 to 25 (Watkins, 2016). Observable behaviors identified as social modeling within secondary education is reflective in peer associations, peer assimilation, and peer accommodation (Akers, 2009; Arnett, 2014). Research has shown that some deviant adulthood behaviors manifested during the young adulthood stage developed through social interactions and peer imitation. As stated by Akers and Jensen (2003), individuals frequently engage in deviant behavior to gain social acceptance from their peers.

According to Arnett (2014), a certain level of risk-taking behavior is normative, signifying the transition of adolescents into emerging adults. Such risky behaviors

include promiscuous sexual behavior, drug use behavior, and any other form of maladaptive behaviors due to peer influence or association. Arnett (2000) developed the Arnett Inventory of Sensation Seeking assessment tool, which is used to identify the normative level of risk-taking behaviors during the developmental ages of 18 to 25 for peer acceptance. The Arnett Inventory of Sensation Seeking instrument was developed to measure transitional developmental challenges among young adults between the ages of 18 to 25 regarding their seeking sensation and the novelty of unfamiliar stimulus and situation (Arnett, 1994).

According to Ravert et al. (2013), research of sensation seeking, peer association, and well-being is relevant to undergraduate college students' healthy adjustment into higher education. Ravert et al. administered a web-based survey to 8,020 undergraduate students between the ages of 18 and 29 (74% female and 26% male) from 19 participating universities and colleges. Ravert et al. used an additional measurement instrument known as the Waterman Questionnaire on Eudemonic Well-Being to ensure the validity and reliability of the relationship between well-being and sensation seeking among undergraduates aged 18 to 25 and peer association (Waterman et al., 2010). Correlations between peer associations were .91, novelty .89., and .92 intensity of sensation, in which novelty and sensation seeking were positively associated with risky behaviors during this specific developmental period for social acceptance (Ravert et al., 2013).

According to Park, Cha, Lim, and Jung (2014), social acceptance and academic success among undergraduates are relatable requiring the need for continual research for

retention and learning engagement in higher education. The social learning study was conducted based on Yu et al.'s (2010) social acceptance model, which was used to explore the measurable constructs of social acculturation, self-esteem, satisfaction, and performance proficiency among undergraduate students (Park et al., 2014). The study population consisted of 730 participants from 27 universities in Korea. The findings identified the significance in social acceptance through social learning for academic success and the need for continual research on the social learning theoretical framework among undergraduate students (Park et al., 2014).

Peer Influence and Substance Use

Additional research has identified a relationship between recreational drug abuse, peer influence, and the need for social affiliation among college students enrolled at 4-year institutions (Ridner, Newton, State, Crawford, & Hall, 2016). For example, a cross-sectional web-based study was conducted among 568 undergraduates at a Mid-Atlantic University to determine well-being and health risk-related behaviors among undergraduates, demonstrating a strong association of well-being and peer affiliation (Ridner et al., 2016). Health-related risk behaviors were collected through the National College Health Assessment II (Ridner et al., 2016). Ridner et al. (2016) predicted social and physical activity, drug abuse, use of mental health services, and sleep quality as contributing factors of social well-being. The multiple regression analysis led to significance in social well-being among the predictor of social and physical activity supporting the importance of peer association and modeling among undergraduates, which has been supported by other research (Feldman, 1969; Ridner et al., 2016).

Research has consistently demonstrated an association in self-reported drug abuse among undergraduates 18 to 25 and social differences of age, ethnicity, gender, individualized self-autonomy and positive relationships with others. Research has also demonstrated recreational drug abuse among undergraduates on 4-year college campuses. However, the research does not address self-reported drug abuse and social differences of age, ethnicity, and gender among emerging adults 18 to 25 with self-autonomy and positive relationship with others on community college campuses.

Measures of Substance Use and Related Factors

The Drug Abuse Screening Tool (DAST-10)

The DAST-10 is a psychometric instrument developed to measure the individualized levels of substance use, abuse, and or dependency (Skinner, 1982; Skinner & Pakula, 1986). According to Skinner (2001), the DAST-10 questionnaire is constructed to capture all substance use behavior other than alcohol for the appropriate level of treatment. The simplicity of the instrument questions minimizes cognitive and behavioral challenges for various settings and population use (Maynard, West, Bumgardner, Krupski, and Roy-Byrne, 2016). The administration of the DAST-10 for clinical and nonclinical settings assist in the early detection of substance use challenges for prevention and rehabilitative measures (Maynard et al., 2016 , 2015). Research on the significance of this instrument will be presented in this section.

The over-prescribing of prescription painkillers has contributed to the recreational use of painkillers among young Americans (Maynard et al., 2016). The Obama Presidential Administration extended the funding available for education and treatment

initiatives concerning substance use disorders to combat this public health epidemic (Maynard et al., 2016). The extension of funding allows substance disorder treatment providers to access assessment tools like the DAST-10 to detect the early onset of drug abuse and so prevent substance-induced overdoses or fatalities (Maynard et al., 2016). Research has shown that the early detection of drug abuse behavior and the appropriate level of treatment serve to minimize negative outcomes associated with drug abuse such as criminal behavior, medical complications, and the average level of social ability (Wheeler, Jones, Gilbert, & Davidson 2014).

The DAST-10 was derived from the Michigan Alcoholism Screening Test (MAST; Skinner, 2001). The initial DAST was constructed as the DAST-20 to capture all drug use behavior including alcohol (Skinner, 2001). The DAST-10 was developed to capture drug abuse behavior other than alcohol (Skinner, 2001). The DAST-10 is an assessment tool that is used to collect data related to the self-reported drug abuse of participants who may have engaged in the recreational use, abuse, or dependency on various psychoactive substances (Skinner, 1982). The DAST-10 is used to assess an individuals' level of self-reported drug use, abuse, or dependency (other than alcohol) within the last 12 months (Skinner, 2001). Respondents complete the DAST-10 by answering 10 drug abuse-related questions. Participants respond to each question with a *yes* = 1 or *no* = 0 response (Skinner, 1982). The evaluated level of drug abuse is based on the total number of *yes* responses to the DAST-10, with lower scores indicating a lower level of drug abuse and higher scores indicating a higher level of drug abuse (Skinner, 1994). The DAST-10 contains developed markers within the instrument, Question 4 and

Question 5, to address under- or over-reporting responses in association to social desirability (Skinner, 2001).

The DAST-10 is a reliable assessment tool for capturing substance use disorders among various populations and different settings (Rosenberg et al.,1998). The DAST-10 does not sustain reliability for self-administered co-occurring disorders in a clinical environment but does present reliability in self-administered nonclinical environments to capture drug abuse behavior (Rosenberg et al., 1998). Reliability of the DAST-10 was reflected in a 1998 quantitative study at Dartmouth University, involving 247 acute patients who were admitted to a state psychiatric hospital for evaluation (Rosenberg et al., 1998). The study was intended to determine the severity of substance use disorders within the identified acute population to facilitate treatment modality determinations (Rosenberg et al., 1998). The DAST-10was initially used to capture drug abuse behavior; however, the collected data demonstrated the need for an additional assessment to identify drug dependence in acute patients seeking residential clinical treatment (Rosenberg et al., 1998). Findings of the study pointed to the reliability of the DAST among individuals in a nonacute phase of drug abuse who do not require clinical, residential treatment.

The DAST has been effectively used to identify substance use disorders within adults ranging 18 to 85 (Smith, Schmidt, Allensworth-Davies, & Salt, 2010). Smith et al. (2010) used a mixed-method study involving more than 50 primary care physicians to assess the prevalence of drug abuse among adults. The researchers used a daily web-based survey administered to patients to assesses whether participants had used drugs

other than those required for medical reasons (Smith et al., 2010). The results showed that the instrument had an 87% likelihood of correctly identifying a substance use disorder. Because of the study, the researchers concluded that more than 80% of the emerging adulthood participant population displayed a subjective substance use disorder as evidenced by their self-reported drug abuse behavior related to the completed web-based DAST-10 assessment (Smith et al., 2010). Additional details regarding the validity and reliability of the DAST-10 will be presented in Chapter 3.

Research Using Ryff Scales

The Ryff Scale of Psychological Well-being is an instrument used to measure the social, psychological, and health-related individualized level of social well-being (Ryff, 1989). Researched and developed by Dr. Carol Ryff (2014) at the University of Wisconsin Institute on Aging, the Ryff Scale of Psychological Well-Being was developed to address individualized social and psychological dimensions as well as health-related behaviors to determine possible characteristics associated with social well-being. The instrument uses five theoretically derived constructs of mental health, self-actualization, optimal function, maturity, and developmental lifespan to measure psychological well-being (Hurd et al., 2014). The original instrument consisted of 84 questions (Hurd et al., 2014). However, there is a shortened version of the instrument consisting of 54 questions from all six domains identified as the medium form of the survey (Hurd et al., 2015).

The Ryff Scale of Psychological Well-Being maintains reliability and validity within the younger adult population between the ages of 18 and 25 due to the nature of the questions addressing self-autonomy, positive relations with others, and self-

acceptance (Theron & Liebenberg, 2015). The simplicity of the question allows the development age group to comprehend the questions without challenges supporting the face reliability of the Ryff assessment (Theron & Liebenberg, 2015). The Ryff Scale of Psychological Well-Being, in its medium form at least, is a reliable assessment tool that can be used to collect data on the following six domains of well-being: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Seifert, 2005). However, I only considered autonomy and positive relations with others. Additional details regarding the validity and reliability of the Ryff Scale of Psychological Well-Being is in Chapter 3.

Researchers have used the Ryff scale to examine aspects of young adults such as socialization and academic performance. For example, Hoyt, Chase-Lansdale, McDade, and Adam (2012), measured the well-being and socialization among developing young adults, determining that well-being in adolescence contributes to positive transitional well-being in young adulthood and higher education. Positive well-being is defined as good health, developed autonomy, mastery, and the ability to engage in social interactions with peers with minimal risky behaviors of sexual promiscuity, mental health challenges, and recreational drug use (Hoyt et al., 2012). Park et al. (2014) also examined social acceptance and academic success among undergraduates. Park et al. used a social acceptance model and the Ryff Scale of Psychological Well-being (1989) to explore sense of autonomy through social acculturation, self-esteem, social acceptance satisfaction, and performance proficiency among undergraduate students (Zung, Richards, & Short, 1965). They identified the significance of social acceptance through

social learning for academic success and the need for continual research on the social learning theoretical framework that exists among undergraduate students (Park et al., 2014).

Another study demonstrating the use of the Ryff scale was conducted by Klainin-Yobas et al. (2016), who used a nonexperimental design at a university in the Philippines to measure the effects of mindfulness and psychological well-being among undergraduates. The sample consisted of 630 male and female undergraduate students who completed the online Ryff Psychological Scale of Well-Being for entry into an allied health program. The Psychological Scale of Well-Being contained 18 items with a 6-point scoring range from *strongly agree* to *strongly disagree* in the self-efficacy, social supports, and positive relationships with others domains. More than 42% of the research participants scored high with *strongly agree* on the Psychological Scale of Well-being in self-efficacy and positive relationships with others presenting a strong association to individualized mindfulness. The remaining participants demonstrated lower scores on the Psychological Scale of Well-being with *strongly disagree* within the social supports and self-efficacy, demonstrating minimal mindfulness with the potential inability to engage in social settings for personal or academic success (Klainin-Yobas et al, 2016).

Summary

Research has consistently demonstrated an association between self-reported substance use among undergraduates 18 to 25 and age, ethnicity, gender, individualized self-autonomy, and positive relationships with others; however, the focus has been on 4-year colleges rather than community colleges. This study was conducted to respond to

this gap in understanding. Findings may provide an opportunity for key stakeholders to identify risk factors and special needs of this particular college, and community, population.

Recreational drug use other than alcohol behavior has been described as a problem that occurs in young adults in higher educational environments (Buccelli et al., 2016). Several studies with 4-year college students have determined that recreational drug abuse differs as a function of demographic variables such as age, ethnicity, and gender (Hurd et al., 2015). Others have noted relationships between person variables such as self-autonomy, and social relational patterns and recreational drug use/abuse (Hoyt et al., 2012; Klainin-Yobas et al., 2016).

Traditionally-aged college students (18-25) fall into a developmental stage that Arnett (2000) has identified as emerging adulthood. As was discussed in this review, emerging adulthood is characterized by a transitional period of developmental challenges influenced by social and peer observations (Arnett, 2014. Developmental tasks for this group include building self-autonomy and healthy interpersonal relationships. Relatedly, Bandura's (1977) theory of social learning emphasizes how an individual's sense of autonomy and self-efficacy is intertwined with social context, including modeling and social reinforcement from others.

Risk-taking behaviors such as promiscuous behavior and drug use are normative among undergraduate students (Arnett, 2014). According to Ravert et al. (2013), sensation seeking behaviors are associated with peer influences among undergraduates seeking acceptance and autonomy. Past and present research has identified a relationship

between recreational drug abuse, peer influences, and the need for social affiliation among college students (Arria & DuPont, 2010; Ridner et al., 2016).

In this study, I explored the relationships among demographic, personal, and relational factors and drug use/abuse among community college students. Previous research has looked primarily at relationships for four-year college students; however, there is a gap in the literature concerning predictive factors among community college students. It is not clear whether findings with 4-year college students also apply to community college students, who may have some different risk factors such as maintenance of relationship networks and norms rather than moving away from home and being exposed to new social influences and opportunities for autonomy.

Findings from this study can provide opportunities for students, parents, college administrators, counselors, faculty, and other community stakeholders to better recognize potential unique vulnerabilities for substance use/abuse among community college students. This information can challenge stakeholders to consider ways to evaluate and respond to these risk factors, including providing supports for resilience for the community college student. The design for this research was a quantitative correlational study. Details of the methodology and the rationale for this study are presented in Chapter 3.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to examine whether there are correlations in the self-reported drug use among a sample of community college students by age, ethnicity, gender, self-autonomy, and positive relationships with others. Research has shown that it is during the transition to college that many students begin to use drugs to cope with the social pressures and demands of higher education (SAMHSA, 2013). Past research revealed that variables such as gender, sense of autonomy, and nature of relationships with others were related to drug abuse among undergraduate college students attending 4-year colleges (Arnett, 2014; Hu et al., 2011; Kristen, 2010; Pope et al., 2014; Whiten, 2014). However, there is a lack of literature regarding variables related to drug abuse in traditional age (18 to 25 years) community college students

This chapter consists of discussions of the research design for the study. In the second section, I discuss the setting and the sample. The instrumentation and data collection procedures that were planned for this study are discussed in the third section. The ethical considerations, guidelines, and procedures that were used to protect the privacy and confidentiality of the participants will follow. The chapter concludes with a chapter summary and an introduction to Chapter 4.

Research Design and Rationale

In this quantitative, nonexperimental, cross-sectional study, I used a survey to examine age, ethnicity, gender, self-autonomy, and social relationships with others as predictors of self-reported drug abuse among a sample of community college students.

Quantitative studies allow researchers to gather data that can be used to make inferences about behaviors and attitudes (Creswell, 2013, p. 155). The primary aim of conducting this research was to be able to draw conclusions that can be generalized to the larger population of community college students. A quantitative study is objective in nature, and the principles of the research are guided by the scientific method (Mertens, 2015). In a quantitative study, data are numerical and statistical tests are performed to answer the study's research questions (Mertens, 2015). The data that I collected in this study were quantitative in nature. I evaluated the strengths of scores of the data that were collected on the independent variables to predict the dependent variable. Therefore, the use of the quantitative methodology was appropriate for my study.

Nonexperimental research designs require the researcher to interpret or observe data for causation or associations among the variables for the analysis of the outcome (Mertler & Vanatta, 2013). I administered an anonymous, web-based survey to collect data from a sample of students attending a Mid-Atlantic community college. I used the data to make interpretations regarding gender, sense of autonomy, and positive relationships with others as predictors of substance use among emerging adult, community college students. Consequently, use of the nonexperimental cross-sectional design was appropriate for this study.

The nonexperimental., cross-sectional quantitative research design also supports the cross-sectional research method (Mertler, & Vanatta, 2013). Cross-sectional research also involves collecting data at only one point in time from a sample that has varied

characteristics (Mertler & Vanatta, 2013). I collected data only once from the participants.

The survey methodology "encompasses any measurement procedure that involves asking questions of respondents" (Trochim, 2013, para. 2). Survey research is used to examine a variety of social issues and concerns in the field of education (Mertler & Vanatta, 2013). Survey research has proven to be an effective way to collect data from a small sample of participants to draw conclusions regarding the behavior and perceptions of a larger population (Mertler & Vanatta, 2013). I used a survey design to collect descriptive data related to gender, individualized social needs, social factors, and self-reported drug abuse among a sample of emerging adult community college students.

Methodology

Population

The setting for this study was a community college located in the Mid-Atlantic region. The community college is one of the largest community colleges in the state it is located in. According to a 2015 report on the enrollment rates for this state, the annual enrollment of the community college system is 300,000 students. According to this same report, the annual enrollment at the community college that was targeted for this study is 18,000 students.

Sampling and Sampling Procedures

The sample population consisted of students currently enrolled at the targeted community college. According to an annual report for the state of the community college, more than 50% of the enrolled student population are considered European American,

35% are considered minority students, and the race is unknown, not specified, or specified as two or more races for more than 15% of these students. The same report revealed that the community college provides full-time and part-time student enrollment classifications. The college also provides various instructional styles, which are composed of traditional campus lectures (55%), distance learning (35%), and hybrid at 10%.

Based on the approval from the Walden IRB (approval #10-18-17-0406220) and the community college partner, I began my recruiting process by sending a college-wide e-mail correspondence to all community college students seeking participation. All participants who met the screening criteria (a) at least 18 years of age and (b) enrolled in a least one course at the college during the research study were considered for the research study. I recruited participants for this study using the convenience sampling process that relies upon self-selected volunteers and a nonrandom sampling process. Convenience sampling is a naïve research strategy for participant recruitment due to the accessibility of the desired research sample (Pedhazur & Schmelkin, 2013). The convenience sample was drawn from the undergraduate student population enrolled at the Mid-Atlantic community college. According to Hulme (2007), a convenience sampling through virtual communications is considered an appropriate method for ensuring confidentiality, accessibility, and willingness of the participants who elect to be part of the study.

I conducted a power analysis (G*Power software) to determine the minimum sample size needed for the data analysis to detect true correlations if they exist for a

linear multiple regression (fixed model, R^2 increase) with a maximum of five tested predictors. I selected a medium effect size of 0.15, an α err probability of 0.05, and Power (1-β err probability) of 80% to compute the minimum sample needed to have adequate power to detect true associations in scores if they exist. The results revealed a minimum sample size of 92 participants to achieve desired parameters. However, allowing for unusable data, I added 25% to my desired minimum sample size (115).

Recruiting Procedures

I recruited potential participants through an e-mail sent through the Mid-Atlantic Community College campus virtual communication system with permission from the Mid-Atlantic Community College technology department. The Mid-Atlantic Community College information technology department sent out an electronic invite to potential participants. The initial e-mail introduced the study and the purpose of the study and contained a link to the online survey. The first page was the screening page to determine participant eligibility. The first screen of the survey presented the following questions:

a) Are you actively enrolled in at least one class at the Mid-Atlantic Community College (yes or no)?

a) Are you 18-25 years of age (yes or no)?

When an individual responded with a *no* to either question, the individual was taken to a screen that thanked them for their participation. The screen contained an announcement indicating the individual was not a good match for study due to answers on the screening protocol. The individual was automatically exited from the survey.

Participants who met the eligibility requirements were routed to the online informed consent. At the end of the informed consent there were two buttons that allowed them to either *Agree* to participate in the study or *Disagree* to not participate in the study. Interested participants who clicked the *Agree* option were routed to the survey. Participants who clicked the *Disagree* button were directed to a screen that thanked them for their time.

Data Collection

Developmental and academic data were collected from the community college research population. The data were collected through the virtual administration of an online survey. The informed consent requires acknowledgement of the participants' comprehension and understanding of their responsibilities and rights while participating in the research study (American Psychological Association, 2014). Participants received the informed consent electronically by agreeing to participate in the study. They were presented a screen by which they acknowledged they understood their rights as participants. The information on the screen indicated that clicking the submit button constitutes acknowledgement and understanding.

Instrumentation and Operationalization of Constructs

The planned demographic and academic information that was collected in this study for each participant consisted of age, gender, and ethnicity, duration of attendance at college, and number of courses attended at college. Age and ethnicity data were not collected because this was not approved by the IRB. Participants in this study completed an online survey, which was composed of the DAST-10, the Ryff Scale of Psychological

Well-Being Surveys, and a short demographic questionnaire. I received permission from each of the authors to use the instruments in this study. However, authorization to publish the DAST-10 was not provided as the DAST-10 is a published instrument, which was also the case with the Ryff Scale of Psychological Well-being instrument.

Drug Abuse Screening Test-10

The DAST-10 was used to collect data related to the self-reported drug abuse of participants in the study. The DAST-10 is a published assessment that was developed by Dr. Harvey A. Skinner (1971), the founder of Marketing Services at the Center for Addiction and Mental Health. The DAST-10 is a short-form assessment that was derived from the DAST-20, a 20-item assessment designed to provide a brief self-report of individualized drug abuse of drugs except for alcohol (Skinner, 2001). The DAST-10 is a self-administered 10-question assessment that requires less than 10 minutes to complete (Skinner, 2001). The original DAST was patterned after the MAST, which was designed to capture drug abuse behavior including alcohol (Selzer, 1971; Skinner 2001).

The DAST-10 is used to assess self-reported use or abuse of drugs other than alcohol within a 12-month period (American Society of Addiction Medicine, 2014). Participants responded to each question on the DAST-10 with a *yes* or *no* response. The *yes* responses were coded with a 1 = *yes* or 0 = *no*. The level of drug abuse was designated as a continuous variable with values that can range from 0 to 10 (see Skinner, 2001). The level of drug abuse was calculated as the total numbers of *yes* responses on the DAST-10, with lower scores indicating a low level of drug abuse and higher scores indicating a high level of drug abuse (see Skinner, 2001). Table 1 shows how the DAST-

10 scores were interpreted regarding the level of drug abuse. Although I planned to use continuous scale scores, I consulted these qualitative categories to convert data to ordinal categories.

Table 1

Interpretation of Scores on the DAST-10 Self-Reported Level of Drug Abuse SPSS Analysis

Total Score	Level of Drug Abuse
9-10	Severe
6-8	Substantial
3-5	Moderate
2 or less	Low level

Reliability of the DAST-10

Measuring reliability pertains to the degree to which an instrument effectively measures a theoretical construct across different groups of individuals, different times, and in different settings (Field, 2013). Inter-item reliability is determined by calculating the Cronbach's alpha of an instrument. A Cronbach's alpha score can range between -.99 to .99 with .70 suggesting high reliability (Field, 2013). Yudko, Lozhkina, and Fouts (2007) stated the Cronbach's alpha score for the DAST-10 was .92 demonstrating a high inter-item reliability that was also reported in other supportive studies when using the DAST -10 (Skinner, 2001; McDonell et al., 2016).

The reliability of the DAST-10 was evaluated with data from 256 drug and alcohol abuse clients (Skinner, 2001). Data from the DAST-10 was correlated with data

from the MAST. The DAST-10 correlated $r = .99$ test-retest reliability with the MAST assessment. The data further revealed internal and consistent reliability at .95 for the total sample population and .86 for a subsample alcohol abuse only population (Skinner, 2001). The DAST-10 also demonstrated consistent reliability with $r = .98$ with a high internal validity of .92 for the total study population and .74 for a study sample population defining drug abuse (Skinner, 2001; Skinner & Pakula, 1986).

According to Rigg and Monnal (2014), the DAST-10 is reliable for identifying self-reported levels of drug abuse other than alcohol. The researchers reported an internal consistency of .86 and test-retest reliability of .94 for the DAST-10 in a study of 324 intake participants seeking treatment for substance use disorders. Among the participant population, more than 40% of the admitting population required a high level of treatment based on the scores obtained from their self-reported drug abuse behavior on the DAST-10 (Rigg & Monnal, 2014).

Other studies have also shown the reliability of the DAST-10. Ferrer, Marks, Midarsky, and Hutz-Midgett (2015) conducted a study on drug abuse among college students using the DAST-10. The cross-sectional study consisted of 244 undergraduate students from a Midwest college. Results from the data demonstrated an internal reliability estimate 0.85 and test-retest reliability of 0.70 (Ferrer et al., 2015). Reliability of the data was determined from results of separate web-based administrations of the assessment (Ferrer et al., 2015). Additional research was conducted by Veliz, Epstein-Ngo, Zdroik, Boyd, and McCabe (2016) on drug abuse behavior among minority collegiate athletes and sexual behavior. The research demonstrated a test-retest reliability

of .89 and .90 internal reliability with the DAST-10 among a sample of 459 college students. The research study participants consisted of males and females over the age of 18. Investigating, the maladaptive behavior of undergraduate students' recreational abuses of mind-altering substances other than alcohol for the preparation of a game (Veliz et al., 2016).

Research demonstrates the reliability of the DAST-10 among various populations in different settings. The test-retest reliability of the DAST-10 demonstrates the instruments ability to be administered to a sample in a research testing setting in an online survey format with the reliability of the data from each data set (Field, 2013). Moreover, the inter-item reliability of the DAST-10 can support the results of a vulnerable construct such as self-reported drug abuse among undergraduate students. The instrument's ability to demonstrate such reliability could measure the self-reported drug abuse among emerging adults 18 to 25 years appropriately. As noted previously, the DAST-10 has baseline Questions 4 and 5 to capture any social desirability bias demonstrated by respondents.

Validity of the DAST-10

According to Vogt and Johnson (2016), valid instruments should demonstrate criterion-related validity demonstrating an accurate prediction and concurrent validity how well it correlates with what the instrument is measuring. According to Skinner (2001), the DAST-10 determined greater criterion validity (.92) of drug abuse behavior with the omission of alcohol. Skinner measured the DAST-10 findings to the Drug Abuse Screening Tool for Adolescents (DAST-A) to ensure only drug use behavior other than

alcohol was captured (Martino, Grilo, & Fehon, 2000; Skinner, 2001). The predictive validity of the DAST-10 scores for young adults is relatable for the appropriate American Society of Addiction Medicine level of treatment for substance use disorders (American Society of Addiction Medicine, 2014; Martino et al., 2000; Skinner, 2001). The concurrent validity of the assessment can be demonstrated through a factor analysis of social desirability and denial of substance use among various participant populations (Skinner, 2001). The concurrent validity of DAST-10 was correlated to the DAST-20 that assesses clinical populations for American Society of Addiction Medicine appropriate levels of drug treatment. Skinner determined that the concurrent validity .99 of the DAST-10 correlate perfectly with the DAST-20 in assessing for the level of drug abuse (Skinner, 2001, p. 191).

Yudko, Lozhkina, and Fouts (2007) assessed the criterion-related validity of the DAST-10 to findings to the MAST. Data analysis of the 1971 MAST developed to measure alcohol drug abuse behavior with validity .89. The data demonstrated consistency in the data findings when the DAST-10 was administrated to participations with alcohol abuse for the appropriate level of treatment (Yudko et al., 2007). Another study, conducted by Maynard et al. (2016),, validated the DAST-10 among a sample of 848 primary care patients with substance use disorders. The face validity of the DAST-10 was established through six clinical experts' observations and evaluations of the tool's ability to assess substance use disorders other than alcohol. According to Maynard et al. (2016), the factor analysis of drug abuse less than 6 months, drug abuse more than 6 months, or drug abuse more than 12 months demonstrated strong construct validity for

various stages of drug abuse behavior other than alcohol. Data demonstrated that the DAST-10 has strong construct validity through the prediction of patients with a substance use disorder would have abused drugs within the last 12 months other than alcohol (Maynard et al., 2016).

López-Pelayo et al. (2015) also assessed the reliability of the DAST-10 for differences among frequencies of drugs abused. The sample for the study consisted of two groups, participants who reported abusing three or more substances and participants who reported abusing two or fewer substances seeking treatment. More than 42% of the participant population who abused three or more substances scored a level of 5 and above, with less than 5% of the population scoring a 4 (López-Pelayo et al., 2016). Participants in group two scored less than 2, low level of drug abuse according to the DAST-10. The data demonstrated the accuracy of the DAST-10 sensitivity range from 95% to 40% and a specificity range of 68% to 99% with a cut off score of 6. The study findings identified the DAST-10 cutoff score for substantial drug abuse is correlative to the frequencies of drug abused (López-Pelayo et al., 2016).

Construct validity refers to the degree to which the instrument operationally defines the theoretical construct it is intended to measure; construct validity is often determined by factor analyses (Field, 2013). According to Skinner (1989), the DAST-10 measures all drug abuse behaviors other than alcohol. Research demonstrated the criterion-related validity of the DAST-10 for the measurement of alcohol and drug abuse. The predictive validity of the DAST-10 demonstrates the appropriate level of treatment based upon the low, moderate, or severe scale of drug abuse. Research continues to

express the reliability and validity of the DAST-10 in determining the level of drug abuse among various populations (Maynard et al., 2016).

Ryff Scales of Psychological Well-Being

The Ryff Scales of Psychological Well-Being, medium form, is a reliable assessment that can be used to collect data on the following six domains of well-being: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff, 1989). In this study, I administered and used only scores on the autonomy and positive relationships with others subscales. The assessment took approximately 14 minutes to complete.

The two Ryff subscales of autonomy and positive relationships with others each consist of seven questions. Participants used a Likert-scale to answer items where the responses range from 1 *(totally disagree*) to 6 (*totally agree*). Responses to the individual items were summed together to yield total scores for each of the two subscales by dividing the sum by 7 to obtain the mean scale score. The scores can range from a low of 7 to a high of 42 on each scale. The overall average score within each demonstrates an individual's level of negative social-well-being, the uncertainty of social well-being, or positive social well-being (Hulme, 2007).

Reliability of the Ryff Scale of Psychological Well-Being

Researchers have emphasized that the ease of administration of the Ryff scales and the self-evaluation of the questions contribute to retrieving reliable responses (Klainin-Yobas et al., 2016; Kafka & Kozma, 2012). The reliability of the Ryff Scale of Psychological Well-being was assessed with a sample of nontraditional students (N =

321) who completed the original 82-item assessment. The results from the study revealed internal consistency values of .83 for the autonomy scale and .88 for positive relations with others scale, reflecting good reliability in the data collected by questions on the survey (Ryff, 1989).

Other studies have also shown the reliability of the Ryff Scales of Psychological Well-being. As part of Kafka and Kozma's (2012) study on social behaviors among 672 undergaduate students, the researchers assessed the internal reliability of the Ryff Scales of Psychological Well-Being. Results from the study produced internal consistency (alpha) coefficients for the six scales which ranged from 0.82 to 0.90 (Kafka & Kozma, 2012). Klainin-Yobas et al. (2016) also used the scales in a nonexperiential study to assess mindfulness and social well-being of college students. Data from the study generated a Cronbach's alpha of 0.92 for the self-autonomy subscale and .98 for positive relationships with others subscales. Participants were administered the initial assessment and upon completion were re-administered the assessment within an hour of initial administration. The test-retest reliability for the six domains of the Ryff scales were as follows: personal growth r = .89; purpose in life, r = .90, environmental mastery r = .86; autonomy, r = .91, positive relations with others .92, and autonomy .87. Finally, Okun and Kim (2016) assessed the internal reliability of data collected in the study on a sample of 578 undergraduate students to determine motivations for social interaction and prosocial behavior. Data from the Ryff Scale of Well-being demonstrated an internal consistency of Cronbach's alpha = .80 for the self-autonomy subscale and .85 for the personal relationships with others subscale.

Results from several studies have revealed that the Ryff Scale of Psychological Well-being collects consistent and reliability data for measuring an individuals' psychological well-being (Kafka & Kozma, 2012; Klainin-Yobas et al., 2016; Okun & Kim, 2016). Data collected by the subscales continue to provide researches empirical data on the individualized perspective of well-being (Okun & Kim, 2016). Therefore, the instrument was valuable to this study on factors influencing community college students' substance use.

Validity of Ryff Scales of Psychological Well-Being

Valid instruments should demonstrate face validity; construct validity, convergent validity, and discriminant validity (Field, 2013). During the original study, Ryff assessed the face validity of the Ryff Scale to determine if the items on the survey appeared to measure psychological well-being (Ryff, 2014). Face validity refers to the degree in which an instrument appears to measure the intended data effectively (Field, 2013). Ryff employed a panel of greater than 50 social sciences subject-matter experts to determine face validity of the six multidimensional facets of psychological well-being. The panel of experts agreed that the on the surface the Ryff Scale of Psychological Well-being measured what it reported to measure (Ryff, 2014).

Klainin-Yobas et al. (2016) conducted an exploratory factor analysis determining the scores range from 30 to 60 for positive psychological well-being and 5 to 10 for negative psychological well-being. The statistical analyses support the construct validity of the Psychological Scale of Well-being with the Cronbach's alphas for the two factors of 0.76 and 0.73. Klainin-Yobas et al.'s continual research emphasizes the significance of

well-being in higher education for undergraduates 18 to 25 to avoid maladaptive behaviors such as promiscuous sexual behavior and recreational drug abuse behavior. The research demonstrates the pivotal need for additional research of self-reported drug abuse and social differences of age, ethnicity, gender, among undergraduates ages 18 to 25 sense of autonomy and positive relationships with others on community college campuses.

Gomez (2016) assessed the content validity of the Ryff Scales. Content validity refers to the accuracy of the items being measured (Field, 2013). The content validity of the Ryff Psychological Scales of Well-being assessment was determined by the Matlick and Clark (1989) Social Interaction Anxiety Scale (Gomez, 2016). Strong content validity of positive relationships with others .89 and self-autonomy .79 of the Ryff two multidimensional psychological well-being domains was correlative to the Social Interaction Anxiety Scale (Gomez, 2016). Developed by Matlick and Clark (1989), the Social Interaction Anxiety Scale measures college students' social interaction among peers and observations by others in social environments (Gomez, 2016). The participants responded to the Social Interaction Anxiety Scale subscales of social interactions among peers and observations of others in social environments correlative to the Ryff Scales of Psychological Well-being subscales of positive relations with others and autonomy. The study demonstrated a correlation between positive relationships with others and perception of self among peers within college students (Gomez, 2016).

An instrument has demonstrated convergent and discriminatory validity when its results are significantly correlated with results from an instrument measuring the same

theoretical construct (Field, 2013). The Ryff Scale demonstrated convergent and discriminatory validity through the comparative analysis of the Center for the Study of Student Life Wellness Assessment: Social Wellness (SLWA; Ridner et al., 2016; Ryff, 2014). The SLWA dimensions of wellness measured the significance in social well-being among college students with the significance of .91 as the Ryff Scale of Psychological Well-being dimension of positive relations with others .90 (Ridner et al., 2016; Ryff, 2014). Present research with the Ryff Scales of Psychological Well-Being measured appropriate levels of well-being as the SLWA with social demographic variables such as age and race to determine the consistency of well-being among emerging adults 18 to 25 (Park et al., 2014).

Variables

The demographic independent variables for this study were planned to be gender, age, and ethnicity. Gender was coded as a categorical (nominal) variable where 1 = male, 2 = female, 3 = other. Ethnicity was planned to be coded as a categorical (nominal) variable where 1= African American / Black, 2 = European American / Caucasian, 3 =Hispanic or Latino, 4=Asian, 5= Native American, 6= Other, or Two or more Races. Age would have been a continuous variable (years). However, due to IRB approval, only gender was assessed in this study.

The remaining research variables were scale scores computed from each of the survey instruments. Each scale score was assumed to be a continuous scale of measurement. Independent variables include scale scores on the measures for self-

autonomy and positive relationships with others. The dependent variable was the scale score for the DAST-10.

Data Analysis

The purpose of this quantitative, nonexperimental, cross-sectional study was to examine age, ethnicity, gender, self-autonomy, and positive relationships with others as predictors of self-reported drug abuse among a sample of emerging adult community college students. Research has shown that it is during the transition to college that many students begin to use drugs to cope with the social pressures and demands of higher education (SAMHSA, 2013).

Prescreening Data

The ability to ensure the accuracy of the data requires a review process of all surveys before analysis demonstrating data cleaning (Field, 2013). All incomplete, duplicate, or improperly formatted surveys were omitted from the research data analysis. All survey data were entered into an SPSS data file (version 24). Categorical data (e.g., some demographic variables) were given numerical codes. The values and meanings of these codes, as well as options for rating scales, were noted in the variable view. To ensure the accuracy of the data, I prescreened all surveys for accuracy, consistency, and missing data. Participant surveys with greater than 15% of omitted answers were considered as having too much missing data, and the survey was excluded from the statistical data analysis (Vogt & Johnson, 2016). I evaluated for outliers in distributions. In lieu of deleting outliers, I considered transformation to reflect the more extreme values

within the population. If there was an outlier, I changed the outlier value to the next lowest/highest value that is not an outlier within the distribution of the population.

Demographics of Participants

Participants were originally going to enter in their age with a numerical value to capture this data as a continuous variable before the IRB did not approve collection of this data. Using SPSS, I planned to conduct a descriptive analysis for the mean, median, standard deviation minimum, and maximum, with a histogram for the descriptive analysis (see Field, 2013). Participants would enter in the duration of attendance at the college and the number of courses attended at a college with a numerical value. I planned to conduct the same statistical analysis for the duration of attendance at college and the number of courses attended at a college as continuous variables. All data not answered with a value was coded with a value of -98 and -99 to avoid confusion of actual ages, duration of attendance at college, and number of courses attended at college.

Participants were also originally to select from a three-level category of ethnicity (African American, European American, or Other) as a categorical variable before the IRB did not approve collection of this data. Using SPSS, I planned to conduct a descriptive statistical analysis of this variable by reporting the frequency and percentage of the population (see Field, 2013). In the current study, participants selected from a three-level category of gender (female, male, or other) as a categorical variable to determine the descriptive statistics of the frequency and percentage of the population (see Field, 2013). All data values missing was coded with NA to avoid confusion in nonresponses.

Internal Reliabilities of Research Scales

I evaluated the internal reliabilities for measurement scales (criterion for acceptance of the Cronbach's alpha >.70; Field, 2013). The Cronbach's alpha measures the internal consitency and variability of the assessments items (Field, 2013). Using SPSS, I conducted the reliability analysis for the Ryff Scale of Psychological Well-being, postive relations with others and autonomy subscales, and the DAST-10 (see Field, 2013; see Ryff, 2014). I obtained the descriptive statisices of the scale, scale if item deleted, sum score, and correlations (see Field, 2013).

Descriptives of Research Variables

The three research variables are scale scores for the responses on self-autonomy, positive relations with others, and the DAST-10 measures. These scale scores were computed as directed for the specific measure (e.g., the sum or mean of the ratings for all items in the scale). The descriptive descriptive statistics (*N*, mean, *SD*, skewness, and kurtosis) were computed and reported for each variable.

Tests of Statistical Assumptions

As the dependent variable, DAST-10 score, was a a continuous variable, I used a linear regression analysis to evaluate the proportion of variance in DAST-10 scores that is predicted/explained by the selected demographic variables and self-autonomy and positive relations with others. Multiple linear regressions depend on bivariate correlations between and among predictors and the outcome variable. The outcome variables were required to meet the assumptions of a continuous variable. Predictors, which were planned as continuous variables and are correlated with the outcome variable, were also

required to meet the assumptions of the Pearson product-moment correlation, a parametric statistical test.

The assumptions for parametric bivariate correlations are that both variables are continuous scale level of measurement, that each variable is normally distributed, that there is homoscedasticity, and a linear relationship between the two variables (Field, 2013). As I collected information from a general population of college students who may or may not use drugs and/or may do so at various frequencies and levels, it is reasonable that the distribution of respondents' scores on the DAST-10 should approximate normality, especially because I was able to correct for social desirability bias on the DAST-10. I conducted a descriptive statistical analysis with normality plots histograms to determine if the data are normally distributed. To determine the normality further, I examined the skewness and kurtosis values and used the results of the Shapiro-Wilks test of normality (see Field, 2013). I investigated for outliers; if the outliers were not due to a data entry error, I considered ways to maintain the meaningfulness of these more extreme scores (e.g., convert the extreme score value to the next lowest/highest score from the mean that is not an outlier). If the correction of outliers still did not help the distribution achieve normality, I planned to consider other transformations of the data, appropriate to the type of skew/shape of the distribution of scores (e.g., square roots for right skewness, squares or cubes for left skewness; see Field, 2013). If any of these variables did not meet the assumptions, I planned to convert the quantitative variable to a qualitative variable, using frequency distributions and conceptual meanings of scores to create categories (e.g., median splits, groupings by categorical interpretations of DAST-10 scores).

In addition to testing assumptions for bivariate correlations I also planned to test assumptions for using a multiple linear regression analysis. The assumptions of this parametric statistic are: (a) a linear relationship between each of the continuous scale of measurement predictor variable and the outcome variable, (b) multivariate normality, (c) no multicollinearity, (d) homoscedasticity. I tested for linear relationships and homoscedasticity by examining plots of the standardized residuals versus predicted Y values and will explore multivariate normality with a goodness of fit test (e. g., Shapiro-Wilks). I computed the Variance Inflation Factor (VIF) to test the assumption of multicollinearity (see Field, 2013).

I recruited a general sample of community college students, not limiting it to students who already had an abuse problem. I planned to have responses from students who fall at different points along the DAST-10 and not only extremes. I recognized that most research data do show skewness, but if the skewness is within tolerance (Shapiro-Wilks test), or the data can be corrected with a transformation (e.g., square root, logarithm), the assumption of normality would have been met using the data. However, I had planned if the data cannot be brought to meet this assumption, the scale scores would have been converted to discrete data. Here, scores would have been grouped into meaningful categories (such as low, moderate, high) and a logistic regression would have been used instead of a linear regression to test the research hypotheses.

As the dependent variable, DAST-10 score, was assumed to be a continuous variable, I tested the assumptions for application of the multiple linear regression analysis to test my research hypotheses. The assumptions of the multiple linear regression analysis

were: (a) a linear relationship between each of the continuous scales of measurement predictor variable and the outcome variable, (b) multivariate normality, (c) multicollinearity, (d) homoscedasticity. I tested for linear relationships and homoscedasticity by examining plots of the standardized residuals versus predicted Y values and explored multivariate normality with a goodness of fit test (e.g., Shapiro-Wilks). I also computed the VIF to test the assumption of multicollinearity (see Field, 2013).

Tests of Hypotheses

Research Question 1

Research Question 1: How well do demographics (e.g., gender) predict self-reported substance use other than alcohol among first-year 2-year college students as determined by scores on the Drug Abuse Screening Test (DAST-10)?

The null hypothesis for Research Question 1 was tested using a linear regression analysis. A linear regression analysis is used to determine the relationship between a dependent variable and one or more independent variables (Mertler & Vanatta, 2013). This analysis was suited for examining the group's relationship on the independent variables (gender) and the dependent variable, which was the level of self-reported substance use other than alcohol (DAST-10 scores). The gender variable had three-levels (female, male, and other), with one dependent variable (self-reported substance use other than alcohol). The overall prediction model was assessed as well as the relative strength of each predictor if the overall model is statistically significant. (A logistic regression would replace the plan if DAST-10 scores were discrete.)

Research Question 2

Research Question 2: How well does sense of autonomy predict self-reported substance use other than alcohol among first-year 2-year college students, with autonomy measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being?

The null hypothesis for Research Question 2 was tested using a linear regression analysis. This analysis was suited for examining the relationship between relationships and self-reported substance use other than alcohol substance use. The sense of autonomy variable had three levels (high, medium, and low) with one dependent variable (self-reported drug abuse other than alcohol).

Research Question 3

Research Question 3: How well do positive relationships with others predict self-reported substance use other than alcohol among first-year 2-year college students (as measured by the positive relations with others subscale from the Ryff Scale of Psychological Well-Being).

The null hypothesis for Research Question 3 was tested using a linear regression analysis. This analysis was suited for examining the relationship between relationships and self-reported substance use other than alcohol substance use. The positive relationship with others variable had three levels (high, medium, and low) with, one dependent variable, self-reported drug abuse other than alcohol.

Research Question 4

Research Question 4: How well does the combination of variables (gender, sense of autonomy, and positive relationships with others) predict self-reported substance use other than alcohol?

The null hypothesis for Research Question 4 was tested using a simultaneous entry multiple linear regression analysis. The overall model was assessed, as well as the relative strength of each predictor if the overall model is statistically significant. (A logistic regression would replace the plan if DAST-10 scores were discrete.)

Threats to Validity

Threats to validity encompass threats to internal and external validity. The internal validity of a correlational research study is "the degree in which the observed changes in a dependent variable can be correlative to changes in an independent variable" (Pedhazur & Schmelkin, 2013, p. 154). Within research studies, the degree to which threats to internal validity influence the study are determined by the type of design and the degree of control that the researcher has about sampling, data collection, and data analyses (Mertens, 2015; Pedhazur & Schmelkin, 2013).

Threats to external validity include testing reactivity or interaction of participant's effect during research treatment are defined as generalizations in research (Mertens, 2015; Pedhazur & Schmelkin, 2013). External threats to validity such as testing reactivity and interaction of participant's effect during research treatment were minimized in this study due to the use of the survey research design method to capture participants self-reported drug abuse effects (see Mertens, 2015). This research study was a

nonexperimental cross-sectional research design with no treatment methods. Treatment interference effect is not applicable to this study reducing the threats of external validity in this study (Mertens, 2015; Pedhazur & Schmelkin, 2013).

Threats to internal validity include history, mono-method bias, statistical regression, instrumentation, morality, and statistical/conclusion validity (Mertens, 2015; Pedhazur & Schmelkin, 2013). Several of these internal threats to validity are relevant only to experimental studies and other studies that use pretest and posttest data or longitudinal studies (Mertens, 2015). This history effect, for example, occurs when a historical event occurs between the first and second data collection. The history effect is not a concern in this study, as data were only collected at one time from self-report questionnaires (see Mertens, 2015). Mono-method bias occurs when only one single method of instrument is used for measurement (Chan, 2009). There are two self-reporting measurements used in this study. This threat is not applicable to this study for the language and comprehension level of each measurement is grade-level 4, minimizing language and comprehension influences for errors in the study data (Chan, 2009; Ryff, 2014: Skinner, 2001). Statistical regression refers to participants who scored very high or low on a pretest having less extreme scores when they take a posttest, and instrumentation refers to any changes in the survey from pretest to posttest (Cook & Campbell, 1979; Pedhazur & Schmelkin, 2013). These threats are not applicable to this study as pretest and posttest data was not a part of the research design. My study was a cross-sectional nonexperimental design whereby data were only collected one time. The threat of maturation also was not an issue in this study. Maturation refers to the process

of maturity on the part of participants during the research process (Mertens, 2015). Although the threat of maturation may be a threat in longitudinal studies, I only collected data from participants at one point in time, thereby eliminating the effects of maturation (Arnett, 2014; Mertens, 2015).

Past research has shown that there are threats to the internal validity of studies using survey research designs (Mertens, 2015). One threat is selection bias, which results from who participates in the study (Mertens, 2015; Pedhazur & Schmelkin, 2013). Participants who may volunteer to participate in studies may provide different responses than those who do not volunteer (Pedhazur & Schmelkin, 2013). It is likely that the students who participated in this study may differ from a population of students based upon developmental ages. For example, some participants may have responded to this study and completed the study survey because they had strong opinions about young adult drug abuse behavior. The use of convenience sampling as compared to random sampling may increase the threat of selection bias and thereby reduce the degree to which results may be to generalize to other samples (Mertens, 2015). Other threats to internal validity of quantitative studies using survey research design are reverse causation and covariates (Mertens, 2015; Pedhazur & Schmelkin, 2013). Reverse causation refers to the inability to know which happen first, the independent or dependent variable; or the dependent variable may be the independent variable and vice versa (Mertens, 2015; Pedhazur & Schmelkin, 2013). However, for the independent variables that pertain to demographic characteristics of the participants, reverse causation was not likely be a threat in this study. It is, however, possible that substance use may function as a causative

agent affecting relationship with others and/or self-autonomy. A correlational analysis allowed me to recognize that possibility, but previous theory and research supports the use of self-autonomy and positive relationships with others as predictors of substance use.

Covariates are confounding variables that act as independent variables to influence the dependent variables (Mertens, 2015). Covariates can also affect the relationship between the independent and dependent variables by challenging the significance of the covariate compromising the internal validity within the study (Mertens, 2015). Although there may be other variables that could be considered as predictors of substance use, the current model to tested has accounted for a significant amount of the variance in substance use, recognizing that the error of variance was also unaccounted for.

Internal and external validity are often inversely related; as the internal validity of a study increases, the external validity decreases (Mertens, 2015; Salkind, 2010). External validity concerns the ability generalizes conclusions drawn from a study of other categories of time, people, and settings (Salkind, 2010). In this study, I only surveyed undergraduate students attending a community college in the Mid-Atlantic United States. Results from this study, therefore, may not have been generalizable to undergraduate students attending other community colleges or to undergraduate students attending 4-year colleges.

Ethical Considerations

It is important that the ethical guidelines regarding human subjects were followed in this study. I obtained informed consent for all participants. Study participants read a consent form and provided their consent to participate in the study. The participants could not participate in the study if they did not provide consent. In the consent form, participants were informed that they could opt out of the study even after providing consent. Furthermore, I provided contact information should any of the participants have any questions about the study.

Regarding data collection, all the results were anonymous; participants did not provide any information that could be used to identify them. Study results were reported in the aggregate and not the individual level. Data were secured in a password-protected file on a password-protected jump-drive so that no data will be stored on a computer's hard drive. The data will be stored for a minimum of 7 years.

Summary

I used a linear regression analysis descriptive survey design to examine the sociocultural factors of gender, self-autonomy, and positive relationships with others as predictors of self-reported drug abuse behavior among community college undergraduate students ages 18 to 25. The Ryff Scale of Psychological Well-Being was used to measure participants' self-autonomy and positive relations with others (Ryff, 2014). The DAST-10 was used to measure participants' self-reported drug abuse behavior (Skinner, 2001). All requirements of Walden University's IRB and the Mid-Atlantic Community College

IRB standards were adhered to before any research was conducted. Chapter 4 includes the findings of the research study.

Chapter 4: Results

Introduction

Opioid use is a nationwide epidemic, with more than 600,000 deaths to date and a prediction of 180,000 more by the year 2020 (Gostin, Hodge, & Noe, 2017). Approximately 50% of the 600,000 deaths were among emerging adults, individuals between the ages 18 and 25; this figure is expected to triple for this group by 2020 (Gostin et al., 2017). Community college students between the ages of 18 to 25 account for more than 50% of the enrolled student population in the United States (U.S. Department of Human Services, National Institute of Health Collaborative Research on Addiction Institute, 2014), with community college students of all ages constituting approximately 33% of the student population (NCES, 2012). NSDUH (2013) revealed that 17.3% of emerging adults ages 18 to 25 reported they had abused or were dependent on an illicit substance. Consequently, approximately 17% or more of community college students could be expected to engage in substance use (NCES, 2012).

The purpose of this study was to examine the relationship of age, ethnicity, gender, sense of autonomy, and positive relationships with others as predictors of self-reported substance use other than alcohol among a sample of community college students. Due to nonapproval from the IRB, age and ethnicity were removed from research questions and related analyses. This chapter includes information on the research sample and data collection procedures. It also includes the statistical analyses employed to test the research questions and associated null hypotheses for this study. The chapter concludes with a chapter summary and an introduction to Chapter 5.

Research Question 1

Research Question 1: How well do demographics (e.g., gender) predict self-reported substance use other than alcohol among first-year 2-year college students as determined by scores on the Drug Abuse Screening Test (DAST-10)?

$H_0$1: There will not be a statistically significant relationship among demographics (e.g., gender) and the level of self-reported substance use other than alcohol among first-year 2-year collegestudents(as determined by scores on the DAST-10), in a sample of traditional age (18 to 25 years) community college students.

H_a1: There will be a statistically significant relationship among demographics (e.g., gender) and the level of self-reported substance use other than alcohol among first-year 2-year collegestudents(as determined by scores on the DAST-10), in a sample of traditional age (18 to 25 years) community college students.

Due to the nonapproval from the Walden IRB to gather research data on ethnicity and age, Research Question 1 was modified to reflect adherence to the Walden IRB guidelines. The null hypothesis for Research Question 1 was tested using a linear regression analysis. A linear regression analysis determines the relationship between a dependent variable and one or more independent variables (Mertler & Vanatta, 2013). This analysis was suited for examining the group's relationship on the independent variable (gender) and the dependent variable the level of self-reported substance use other than alcohol. The gender variable had three categories (female, male, and other), with one dependent variable, self-reported substance use other than alcohol.

Research Question 2

Research Question 2: How well does sense of autonomy predict self-reported substance use other than alcohol among first-year 2-year college students, with autonomy measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being?

$H_0$2: There will be no statistically significant relationship among sense of autonomy and the level of self-reported substance use other than alchol among first-year 2-year college students (as measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being).

H_a2: There will be a statistically significant relationship among sense of autonomy and the level of self-reported substance use other than alcohol among first-year 2-year college students (as measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being).

The null hypothesis for Research Question 2 was tested using a linear regression analysis. This analysis was suited for examining the group's relationship on the independent variable of sense autonomy in relationship to the level of self-reported substance use other than alcohol.

Research Question 3

Research Question 3: How well do positive relationships with others predict self-reported substance use other than alcohol among first-year 2-year college students (as measured by the positive relations with others subscale from the Ryff Scale of Psychological Well-Being).

$H_0$3: There will be no statistically significant relationship between positive relationships with others and the level of self-reported substance use other than alchol among first-year 2-year college students (as measured by the positive relations with others subscale from the Ryff Scale of Psychological Well-Being).

H_a3: There will be a statistically significant relationship among positive relationships with others and the level of self-reported substance use other than alcohol among first-year 2-year college students (as measured by the positive relationss with others subscale from the Ryff Scale of Psychological Well-Being).

The null hypothesis for Research Question 3 was tested using a linear regression analysis. This analysis was suited for examining the relationship between positive relationships with others and self-reported substance use other than alcohol.

Research Question 4

Research Question 4: How well does the combination of variables (gender, sense of autonomy, and positive relationships with others) predict self-reported substance use other than alcohol?

$H_0$4: The independent variables of gender, sense of autonomy, and positive relationships with others (as measured by the autonomy and positive relations with others subscales from the Ryff Scales of Psychological Well-Being) will not predict a statistically significant amount of the variance in participants' level of self-reported substance use other than alchol (as determined by scores on the DAST-10).

H_a4: The independent variables of gender, sense of autonomy, and positive relationships with others (as measured by the autonomy and positive relations with others

subscales from the Ryff Scales of Psychological Well-Being) will predict a statistically significant proportion of the variance in on the participants' level of self-reported substance use other than alcohol (as determined by scores on the DAST-10).

The null hypothesis for Research Question 4 was tested using a linear regression analysis, which was suited for examining the group's relationship on the independent variables (gender, sense of autonomy, and positive relationships with others) and the dependent variable, the level of self-reported substance use other than alcohol. The gender variable had three-levels (female, male, and other). The sense of autonomy and positive relationships with others scale scores (with three categories of high, medium, and low, as measured by the autonomy and positive relations with others subscale from the Ryff Scale of Psychological Well-Being), and the dependent variable of self-reported substance use other than alcohol (as determined by scores on the DAST-10), were continuous scales of measurement. The null hypothesis for Research Question 4 was tested using a simultaneous entry multiple linear regression analysis. The overall model was assessed as well as the relative strength of each predictor if the overall model is statistically significant.

Data Collection

Recruitment

Following approval by the Walden University IRB (#10-18-17-0406220) on October 17, 2017, the duration of the data collection consisted of 5 active recruitment weeks. I recruited potential participants through a research request e-mail to my community partner, a community college in the Mid-Atlantic region of the United States.

The college's technology department granted permission to deploy the research survey college e-mail system. They sent out an electronic invite to potential participants. An additional administration of the e-mail through the student services department occurred during the National Institute on Substance use for Teachers (2017), National Drug and Alcohol Facts Week, which was established by the National Institute of Health (2017) to present drug use and alcohol information and awareness to students, teachers, and administrators in education.

The initial research e-mail introduced the research study and the purpose of the study and contained the participant eligibility criteria. The first page was the screening page to determine participant eligibility. Because the Walden IRB did not approve all the planned research variables, questions to collect data on the ethnicity demographic variable and the actual age of the respondent were removed from the research study for participant eligibility. The first screen of the survey presented the following questions:

a) Are you actively enrolled in at least one class at the Mid-Atlantic Community College (yes or no)?

b) Are you 18 years of age or older (yes or no)?

When an individual responded through an electronic device with a "no" to either question, the individual was taken to a screen that thanked them for their participation as indicated in the informed consent. The screen contained an announcement indicating the individual was not a good match for study due to answers on the screening protocol. The individual was automatically exited from the survey.

Participants who met the eligibility requirements were routed to the online informed consent. At the end of the informed consent, two buttons were present that allowed them either to *Agree* to participate in the study or *Disagree* to participate in the research study through an electronic device. Interested participants who clicked the *Agree* option were routed to the research survey to complete electronically. Participants who clicked the *Disagree* button were directed to a screen that thanked them for their time.

During the 5-week research participant recruitment process, approximately 2,000 e-mails were generated to the community college population during the initial week of the research study. During the second and third weeks of the recruitment process, more than 50% of the electronically requested research participants did not meet the minimum eligibility requirements. During the final weeks of the research study process, the remaining participant population resulted in 500 electronic responses, of which 300 were eligible research study responses, with a final volunteer participant group of $n = 118$ research participants. As the research study process was privately completed through an electronic device (computer, laptop, cellphone, etc.), no adverse events were presented during the research study. There were no reported concerns or adverse events presented during the research study.

Sample

Data from all completed surveys were analyzed using SPSS (version 24). There were 118 participants who completed the survey. All participants were 18 years of age or older and enrolled in at least one class at the community college. There were 55 females, accounting for 46.6% of the research study participants, 49 males (41.5%), and 13 (11%)

who indicated “other” for participant gender. Thus, females constituted the largest proportion of the research participants, but there also were a good proportion of males.

Internal Reliability of Test Measures

Before computing mean ratings for the research scales, I computed the Cronbach’s alpha to estimate internal reliability of each scale for the study’s sample. A value of .70 or higher usually is considered acceptable for social science research (Field, 2013). Results are presented Table 2. The Cronbach’s alpha for the DAST-10 of alpha = .90 demonstrated consistency among the 10 items measured for the measure of the dependent variable. Similarly, the Cronbach’s alpha = .74 for the Ryff subscale of positive relationships with others demonstrated acceptable internal consistency. However, the Ryff subscale of autonomy showed a Cronbach’s alpha = .68, suggesting marginal reliability. This finding will be considered when interpreting results of analyses.

Table 2

Cronbach’s Alpha for Each of the Research Scales for the Study’s Sample

Scale	Number of Items	Cronbach’s alpha
DAST-10	10	.90
Ryff		
Autonomy	7	.68
Positive Relationships	7	.74

Social Desirability

In order to see if the respondents generally were reporting their substance use in a truthful manner, I used their responses on Question 3 of the DAST-10 to evaluate social desirability response bias: Are you always able to stop using drugs when you want to? (If you never use drugs, answer "Yes"). This item has been used for this purpose with this instrument, as Question 4 was not required to measure a social desirable response on the DAST-10 short form (Skinner, 2001). If individuals generally were responding truthfully, those with lower self-reported drug use/abuse activities should indicate less problem with stopping when they want to than those who self-reported higher levels of drug abuse activities. To test this, I classified the DAST-10 sum scores into four severity levels of drug abuse using the conventions shown in Table 1 in Chapter 3. There were no cases in my sample who fell into the *Low* category (DAST score 0-2). I then cross-tabulated the frequency of respondents who indicated they did or did not agree with the test item that said they "always" are able to stop drug use. Results are summarized in Table 3. Although there generally was the expected relationship between ease of stopping drug use and other self-reported drug use behaviors ($p < .001$), there were 10 cases of individuals who fell into the severe range, and 30 in the substantial severity level who indicated that they always are able to stop drug use. This suggests the risk of some existence of positive response bias for these data or simply these are reflections of denial that is associated with drug abuse and dependency (McCabe et al., 2014).

Table 3

Frequencies of Endorsement of the DAST-10 Social Desirability Check Item by Severity of Respondent's Self-Reported Drug Use

Severity of self-reported drug use	Stopping drug use	
Total DAST-10 score range	Always able	Not always
Moderate (3-5)	35 (24.1)[a]*	1 (11.9) *
Substantial (6-8)	34 (32.1)	14 (15.9)
Severe (9-10)	10 (22.8)*	24 (11.2)*
Total	79	39

[a] Observed frequency (expected frequency); Chi Square(2) = 36.89, $p < .001$; phi = .56, $p < .001$)

*adjusted standardized residual, $p < .001$

Cleaning and Screening of Data

Cleaning

I began the review of my data checking for errors in data entry through visual observation to ensure no data cells were empty or duplicated. All responses for one item were missing. When I checked, I found that this was not a survey question, but a place that presented the required definition of self-autonomy. I removed the empty variable from my data file.

I computed the mean rating for the items in each of the three scales (autonomy, positive relationships with others, and DAST-10) that I used to evaluate the continuous research variables. I treated the data for the autonomy and positive relationships with others scales as continuous because the data meth the characteristics of continuous scale

of measurement. Although others have categorized scores on these variables for interpretation (Pope et al., 2014; Ravert et al., 2013), statistical power is greater with continuous rather than discrete level of measurement (Field, 2013). I then examined the distributions of these scores to evaluate for outliers as well as assumptions of the planned statistical analyses.

Checking for Outliers

Using the SPSS Explore function, I evaluated the data for outliers. I began with a visual inspection of the boxplot for the DAST-10 substance use data and discovered no outliers (see Appendix C). Similar exploration of the Ryff Autonomy subscale scores also demonstrated no outliers (see Appendix D). I concluded my visual observation with the boxplot for the Ryff positive relationships with others distribution, which indicated two outliers above the mean (see Appendix E). As there was no reason to believe that these values were errors, but rather represented more extreme members of this population, I used the Winsor method for correction, where these extreme values were changed to the value of the highest observed data point that falls within the acceptable range and is not an outlier (Field, 2013).

Descriptive Statistics for Research Variables

The observed mean, standard deviation, skewness, and kurtosis for the scores on each research variable are presented in Table 4.

Table 4

Descriptive Statistics for Each Research Variable

Variables	Mean	Standard Deviation	Skewness	Kurtosis
DAST-10	.55	.49	-.242	-1.97
Ryff				
Autonomy	3.12	.76	-.154	-.197
Positive Relationships	3.15	.70	-.240	-.523

Tests of Statistical Assumptions

The planned statistical model of analysis for the current study was a multiple linear regression. I tested the following univariate and multivariate assumptions for use of this parametric statistical analysis. The first assumption of this statistic is that the dependent variable is a continuous variable. The use of scale scores would suggest that this assumption was met. In order to test whether the dependent variable met the univariate assumption of a normal distribution, I examined the histogram and normal q-q plot of the distribution of DAST-10 scale scores (see Figures 1 and 2), as well as the values for skewness and kurtosis (see Table 4), and results of the Shapiro-Wilk test of normalcy (see Table 5).

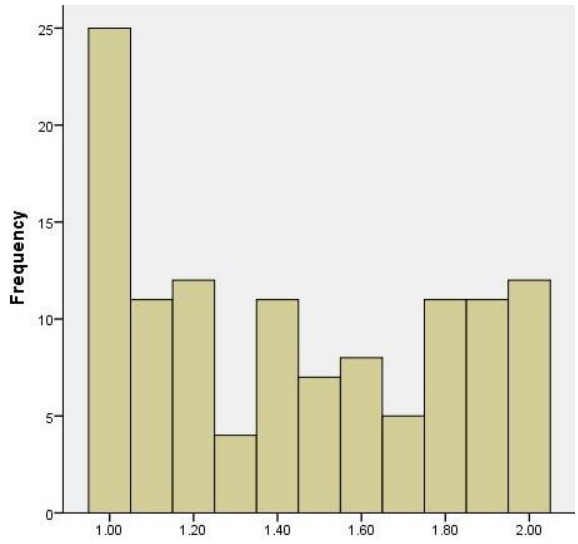


Figure 1. Histogram for distribution of DAST-10 scale scores.

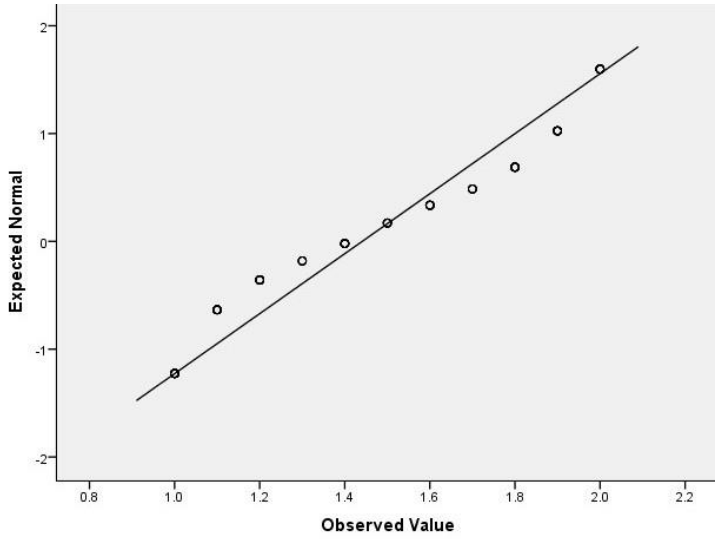


Figure 2. Normal Q-Q plot of residuals for DAST-10 scale scores.

Table 5

Results of Shapiro-Wilk Tests for Normalcy for the Research Variables

Variable	Statistic	Df	Sig
DAST-10	.887	118	< .001
Ryff			
Autonomy	.984	118	.179
Positive Relationships	.975	118	.028

There were mixed results for the DAST-10 distribution from these results. There was a positive skew to the distribution of DAST-10 scores, with a peak frequency occurring at the lowest scale range (Figure 1). The normal q-q plot of the residuals (Figure 2), where the observed values were compared with a standardized theoretical distribution of a family of tests (Field, 2013), suggested some deviations from the expected linear pattern. Further, the Shapiro-Wilk test (Table 5) was positive at $p < .001$. However, the values for skewness and kurtosis for the distribution (Table 4) were within acceptable limits. In addition, attempts to reduce the skew through transformations were not successful. I decided to treat this assumption as met, unless results of tests of multivariate assumptions suggested otherwise.

Linearity

The assumption of linearity relates to the shape of the relationship between the predictor and dependent variables. It is assumed that the relationship between a predictor variable and the dependent variable is linear (rather than curvilinear). Figure 3 presents the scatterplot for the relationship between the Ryff scores for autonomy and the DAST-

10 scores for substance use. Figure 4 presents the scatterplot for the relationship between positive relationships and substance use. These did not indicate risk of a nonlinear relationship (see Table 6).

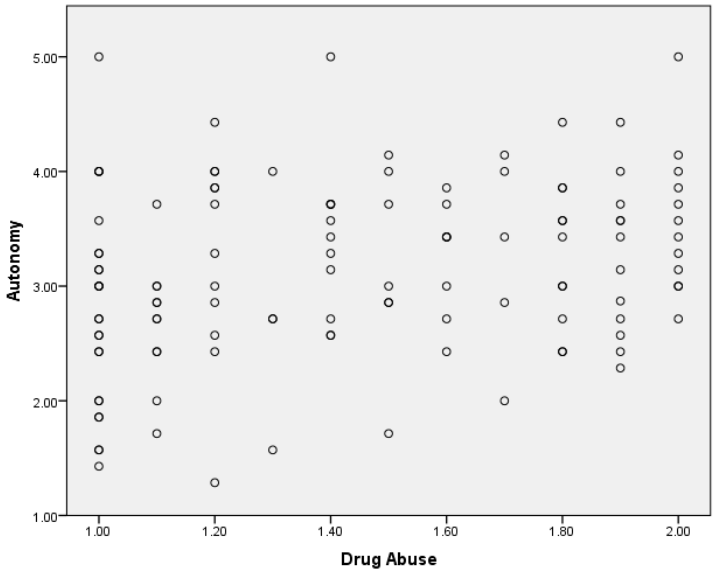


Figure 3. Relationship between scores on the RYFF Autonomy scale and scores on the DAST-10 measure of self-reported substance use.

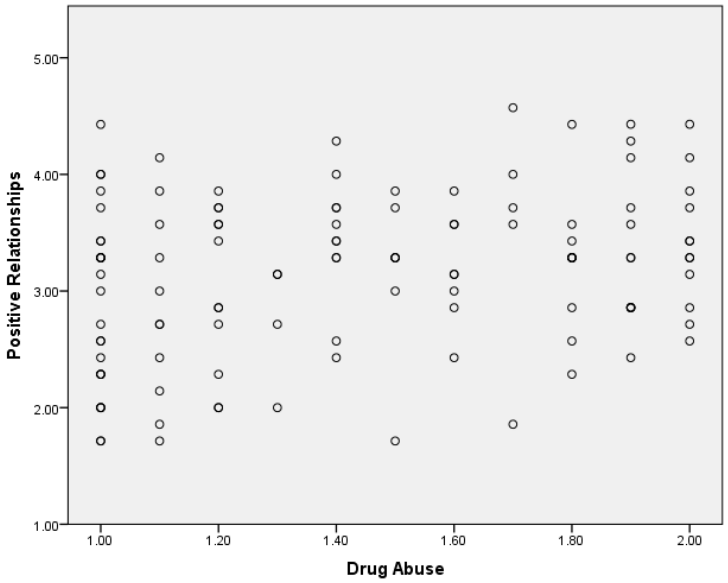


Figure 4. Relationship between scores on the RYFF positive relations with others scale and scores on the DAST-10 measure of self-reported substance use.

Bivariate Relationships Between Variables

Prior to testing the research hypotheses, I computed the bivariate relationships between all of the continuous variables. Results are summarized in Table 6.

Table 6

Bivariate Correlations Between Continuous Variables

	Autonomy	Personal Relations	Substance use
Autonomy	---		
Positive Relations	.68**	---	
Substance Use	.29**	.28**	---

Note. ** Correlation is significant at the 0.01 level (2-tailed)

Due to the observed level of correlation between scores on the two subscales of the Ryff Test, a factor analysis (principal component method) was performed to explore the factor structure with the current sample's data. Results indicated a one factor solution (64.40% of total variance). Each subscale loaded at .802 on the resulting component. Thus, the two scales appear to be measuring a common (unknown) underlying factor.

Multivariate Assumptions

The following multivariate assumptions were tested as part of the multiple linear regression analyses: multivariate normality, multicollinearity, and homoscedasticity. Results of these tests will be reported as part of the summary of results of the regression analyses.

Tests of Research Hypotheses

After the IRB did not approve collection of information for age and ethnicity, there were only three predictor variables, one nominal (gender: male, female, other) and two continuous (Ryff autonomy and positive relationships with others subscales), and one dependent variable (DAST-10 measure of self-reported substance use other than alcohol). Results of analyses are presented separately for each of the research questions.

Research Question 1

Research Question 1: How well do demographics (e.g., gender) predict self-reported substance use other than alcohol among first-year 2-year college students as determined by scores on the Drug Abuse Screening Test (DAST-10)?

$H_0$1: There will not be a statistically significant relationship among demographics (e.g., gender) and the level of self-reported substance use other than alcohol among first-

year 2-year collegestudents(as determined by scores on the DAST-10), in a sample of traditional age (18 to 25 years) community college students.

H_a1: There will be a statistically significant relationship among demographics (e.g., gender) and the level of self-reported substance use other than alcohol among first-year 2-year collegestudents(as determined by scores on the DAST-10), in a sample of traditional age (18 to 25 years) community college students.

As gender had more than two categories (male, female, other), I created two dummy variables, using female as the reference category because it was the group with the largest number of cases. The hypothesis was tested using a linear regression analysis. There was no significant relationship between gender and self-reported substance use, $F(1, 118) = .73$, $p = .395$. Thus, the null hypothesis for Research Question 1 was not rejected.

Table 7

Predictor Coefficients for Model Variables Predicting Substance Use Other than Alcohol

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Model Variable	B	Std. Error	β	t	Sig.	Tolerance VIF
Constant	1.43	0.048		29.42	<.001	
Male	0.024	0.071	0.033	.335	.738	.912, 1.096
Other	0.108	0.111	0.094	.965	.337	.912, 1.096

Research Question 2

Research Question 2: How well does sense of autonomy predict self-reported substance use other than alcohol among first-year 2-year college students, with autonomy measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being?

$H_0$2: There will be no statistically significant relationship among sense of autonomy and the level of self-reported substance use other than alchol among first-year 2-year college students (as measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being).

H_a2: There will be a statistically significant relationship among sense of autonomy and the level of self-reported substance use other than alcohol among first-year 2-year college students (as measured by the autonomy subscale from the Ryff Scale of Psychological Well-Being).

A linear regression was used to evaluate this one continuous variable as predictor of the continuous dependent variable. As predicted, sense of autonomy was a statistically significant predictor of self-reported substance use, $R^2 = .085$, $F(1, 116) = 10.71$, $p = .001$. Inspections of the histogram of standardized residuals and of the normal p-p plot of regression standardized residuals indicated acceptable multivariate normality (see Appendix D and Appendix G).

Research Question 3

Research Question 3: How well do positive relationships with others predict self-reported substance use other than alcohol among first-year 2-year college students (as

measured by the positive relations with others subscale from the Ryff Scale of Psychological Well-Being).

$H_0$3: There will be no statistically significant relationship between positive relationships with others and the level of self-reported substance use other than alchol among first-year 2-year college students (as measured by the positive relations with others subscale from the Ryff Scale of Psychological Well-Being).

H_a3: There will be a statistically significant relationship among positive relationships with others and the level of self-reported substance use other than alcohol among first-year 2-year college students (as measured by the positive relationss with others subscale from the Ryff Scale of Psychological Well-Being).

Similar to Research Question 2, a linear regression was used to evaluate positive relationships with others as a single, continuous predictor of the continuous dependent variable. As predicted, positive relationships with others was a statistically significant predictor of self-reported substance use, $R^2 = .076$, $F(1, 118) = 9.55$, $p = .003$. Again, inspections of the histogram of standardized residuals and of the normal p-p plot of regression standardized residuals indicated acceptable multivariate normality (see Appendix G).

Research Question 4

Research Question 4: How well does the combination of variables (gender, sense of autonomy, and positive relationships with others) predict self-reported substance use other than alcohol?

$H_0$4: The independent variables of gender, sense of autonomy, and positive relationships with others (as measured by the autonomy and positive relations with others subscales from the Ryff Scales of Psychological Well-Being) will not predict a statistically significant amount of the variance in participants' level of self-reported substance use other than alchol (as determined by scores on the DAST-10).

H_a4: The independent variables of gender, sense of autonomy, and positive relationships with others (as measured by the autonomy and positive relations with others subscales from the Ryff Scales of Psychological Well-Being) will predict a statistically significant proportion of the variance in on the participants' level of self-reported substance use other than alcohol (as determined by scores on the DAST-10).

As noted earlier, data for age and ethnicity were not collected, per requirements of the IRB. Thus, a multiple regression with three predictor variables was conducted to test this research hypothesis: gender (male, female, other), sense of autonomy, and positive relationships with others. The same dummy variables for gender as used to test Research Question 1 were used for this analysis. Tests of assumptions indicated no problems with collinearity (all VIF values were less than 1.88). Inspection of the histogram and the scatterplot for regression standardized residuals indicated no problems with multivariate normality or heteroscedasticity. Results indicated that the three predictors accounted for a statistically significant proportion of the variance in DAST-10 scores, $R^2 = .096$, $F(3, 114) = 4.03$, $p = .009$. Thus, the null hypothesis for Research Question 4 was rejected.

Although predictions were not made concerning the relative strength of individual predictors, when controlling for other predictors, it may be noted that no single predictor

alone was a statistically significant predictor of substance use other than alcohol when controlling for the contributions of the other predictors. These results are summarized in Table 8.

Table 8

Prediction Coefficients for Model Variables Predicting Substance Use Other than Alcohol

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Model Variable	B	Std. Error	β	t	Sig.	Tolerance VIF
Constant	.933	0.157		5.936	<.001	
Autonomy	0.088	0.157	.189	1.536	.127	.530, 1.886
Positive Relationships with Others	0.074	0.064	.143	1.167	.246	.532, 1.879
Male	-0.003	0.069	–0.005	-.050	.960	.899, 1.112
Other	0.034	0.110	0.030	.314	.754	.875, 1.142

Summary

This study was designed to evaluate demographic variables, autonomy, and positive relationships with others as predictors of substance use other than alcohol among first year community college students. A total of 118 students (46.6% female, 41.5% male, and 11% other), 18 years of age or older and enrolled in at least one class at the community college completed the survey package, which consisted of the demographic questionnaire, the Ryff scales for autonomy and positive relationships with others, and the DAST-10 measure of substance use other than alcohol.

Evaluation of internal reliability of the Ryff subscales and the DAST-10 scores indicated adequate Cronbach's alpha values for the DAST-10 and for the Ryff positive relationships with others scales. However, the alpha of .68 for the Ryff autonomy scale was below the accepted criterion of alpha = .70. Further, a factor analysis of the Ryff subscale scores did not support the assumption that these subscales were measuring independent constructs. These findings will be considered further in Chapter 5 when I discuss limitations of this study and recommendations for further research.

Because the IRB did not approve collection of information on ethnicity and age, I had only one demographic indicator, gender. In general, gender was not a predictor of DAST-10 scores (substance use other than alcohol; Research Question 1 and Research Question 4). Sense of autonomy and positive relationships with others were individually statistically significant predictors of DAST-10 scores (Research Question 2 and Research Question 3). The final analysis simultaneously tested gender, sense of autonomy, and positive relationships with others as predictors of substance use other than alcohol. Overall, the prediction model accounted for a statistically significant proportion of the variance in DAST-10 scores—that is, in self-reported substance use other than alcohol (Research Question 4). Thus, the null hypotheses were rejected for Research Questions 2, 3, and 4.

Further discussion of findings from the research will be presented in Chapter 5. I will also discuss the theoretical and social significance in the research findings and provide recommendations for future research studies.

Chapter 5: Conclusions and Recommendations

Introduction

Previous researchers have identified variables such as age, ethnicity, gender, sense of autonomy, and nature of relationships with others to be related to substance use among undergraduate college students attending 4-year colleges (Arnett, 2014; Hu et al., 2011; Kristen, 2010; Pope et al., 2014; Primack et al., 2011; Whitten, 2014). However, there was minimal research available to examine the identified factors for community college students. The purpose of this quantitative, nonexperimental, correlational study was to examine the relationship of demographic variables, sense of autonomy, and positive relationships with others as predictors of self-reported substance use other than alcohol among a sample of community college students located in a Mid-Atlantic state in the United States. Anonymity in research protects the research participants' privacy and confidentiality (Field, 2013). To maintain the privacy and confidentiality of the research participants, age and ethnicity data were not collected from the research participants in this study.

During the transition to college, many students begin to use illicit substances to cope with the social pressures and demands of higher education (SAMHSA, 2013). Day et al. (2013) indicated a need for drug prevention programs on college campuses among undergraduate students to help students achieve academic success. Although there is research on substance use among students attending 4-year colleges in the United States, there is little research on key risk factors for illicit substance use other than alcohol among traditional age (18 to 25 years) students attending community colleges (Arnett,

2014). Therefore, I contributed to the literature by examining risk factors for self-reported substance use other than alcohol among a sample of community college students.

Community college students constitute approximately 33% of the student population (NCES, 2012); thus, they represent a significant portion of college students who are at risk for drug abuse. NSDUH (2013) revealed that 17.3% of emerging adults ages 18 to 25 reported they had abused or were dependent on an illicit substance. Consequently, approximately 17% or more of community college students could be expected to engage in drug abuse (NCES, 2012).

This study was significant because results from the study revealed the scope and magnitude of illicit substance use other than alcohol, and related risk factors, among a sample of community college students. As my research reflected, there was more than 50% of a higher level of substance use other than alcohol among emerging adults at the examined community college in the Mid-Atlantic United States. The information from the research population identified a higher probability of substance use other than alcohol among females, establishing a guideline of focus for college drug use research and program development. College administrators, counselors, and advisors can use the information to apply for federally funded grants for developing programs that address substance use other than alcohol in the community college setting (U.S. Federal Drug Enforcement Administration, 2016). This information can also be useful to college counselors and leaders to promote the need for drug abuse prevention and education programs at community colleges in the United States, including those targeting students with identified risk factors.

Interpretation of the Findings

As expressed in previous research, sociocultural factors such as autonomy and positive relationships with others are significant factors in substance use other than alcohol among community college emerging adults 18 to 25 years of age. According to Ryff (2014), autonomy and positive relationships with others are significant factors in determining well-being within an individual. The Ryff subscale of autonomy (an individual's subjective perspective of self) and the positive relations with others subscale (an individual's subject perspective within socialization) demonstrate two different constructs in well-being. However, the factor analysis of scores from the two subscales determined that the two subscales were measuring the same overall construct for this sample, which may be psychological well-being. This overall construct was a statistically significant predictor in substance use other than alcohol among community college learners. Perhaps it was the correlation of a sense of autonomy from institutional social norms (for example, parental influences), with higher attachment to and identification with peers that was predicting substance abuse. This would be consistent with characterization of emerging adulthood (Arnett, 2000). The relationship with increased substance use other than alcohol among these community college learners also suggests that use of these substances is related to peer group norms. As there were no differences based on gender, it does not appear to be a different group-based influence for male or female community college students.

Arnett's (2014) emerging adulthood theory expresses significance in recreational substance use as a normal risky behavior during the transitional periods of development.

The theoretical perspective of an individual's self-regulation and social governance throughout development is predicated on Erik Eriksson's (1980) psychosocial stages of development theory. Emerging adulthood theory also addresses the importance of peer influences and maladaptive behaviors through assimilation and accommodation for acceptance within the early 20s of a young adult. The behaviors of assimilation and accommodation are supported by Bandura's (1977) social learning theory, which helps explain an individuals' learning and imitation of social maladaptive behaviors such as recreational drug use for peer acceptance.

My findings of a significant relationship between positive relationships with peers and substance use/abuse are consistent with emerging adulthood theory, social learning theory, and psychosocial stages of development theory: peers play a central role during an individual's development and, through processes of imitation and assimilation, may support maladaptive behaviors such as recreational substance use other than alcohol. Further, emerging adulthood is marked by newly found autonomy, where social groups may replace the influences of other institutions (Arnett, 2000). This overlap of personal sense of autonomy with peer relationships appears to be a reliable predictor of risk of substance use/abuse, especially if that is a social norm of the peer group.

Limitations

There were several limitations in this study that may have affected its generalizability. This study was limited to community college students who attended a Mid-Atlantic community college, whereas a study of community college students from additional community colleges may have provided a different presentation of recreational

substance use other than alcohol on the variables of gender, sense of autonomy, and positive relationships with others in this study. Another limitation was the IRB nonapproval of age and ethnicity descriptive variables, which minimized the descriptive statistics within the study and further limits clarification of the demographic makeup of this sample (Field, 2013), as well as any patterns that may have emerged as differences related to age or ethnicity.

Inclusion bias may have also been a limitation of the research findings. Inclusion bias in research is reflective of an overestimation or underestimation of truth within a specific group (Mertens, 2015). The study population for this research study must have attended at least 1-year at the selected research study community college. Using participants from the selected research study community college may have demonstrated response bias due to population similarity (see Mertens, 2015).

The sampling method may have presented further limitations on the generalizability of results from the study. Convenience sampling was used to recruit participants for this study (see Field, 2013). The convenience sample of participants who took the web-based survey may not have represented the entire population of the students at the community college. The descriptive statistic of gender gave some indication of the representativeness of the sample. The female student population at the community college responded 50% higher than the other genders at the community college regarding a higher level of substance use, which means females had a higher rate of substance use comparative to males within higher education (Schepis et al., 2016).

Concurrent validity may have also been a limitation within this study (see Field, 2013). Although the DAST-10 has demonstrated high concurrent validity in capturing substance use behavior (Skinner, 2001), it is unknown how accurately the students' self-reports on the measure correspond to their actual substance use behaviors. Response bias may have proposed a further limitation in this study as participants may have consciously or subconsciously provided biased responses to the survey questions (see Field, 2013). Response bias refers to misleading responses in a research process from inaccurate or truthful responses (Field, 2013). The DAST-10 contains developed markers within the instrument (Question 3) to address under- or overreporting responses in association to social desirability (Skinner, 2001). When I checked the data, I found an association between responses on Question 3 and participants' self-reported level of substance use; the lower the level of abuse the greater the number of respondents who said that they always can control their drug use. By comparison, a smaller percentage of students who reported higher levels of substance abuse indicated they had control. This was expected; however, there still were cases in the higher severity group who indicated they always had control and could choose not to use when they wanted to. Their response might have been a deliberate or unconscious attempt to be socially appropriate or consistent with the denial process, which is known to be common among more serious drug abusers. Because the question that is supposed to evaluate for social desirability bias is still asking about behaviors that are related so closely to substance abuse (Skinner, 2001), it is difficult to know if it is the best item one can have in this measure as a check for social desirability.

The anonymous intent of the data collection in this study helped to address the challenges of social desirability bias. Participants were informed of their privacy and confidentiality protection to avoid response biases of the participants (Field, 2013). Participants who did not return the assessments generated a nonresponse bias, which reduced the sample size in this study. Nonresponse bias presents challenges to survey research as this limitation may affect the variables at the outcome of the study (Field, 2013).

There also were some questions about the Ryff Psychological Well-Being Scale scores. Although previous reports indicated that there were two independent subscales to measure separately autonomy and positive relationships with others, this did not prove to be true with my sample. Instead, the factor analysis demonstrated that the two subscales were measuring one in the same common construct. The scale is intended to measure psychological well-being, which appeared to be related to self-reported substance abuse other than alcohol among this group. Any of these issues that arose in relations to the instruments I chose for this study can be possibilities for future research.

Recommendations

Based on the strengths and limitations of this present study, I suggest future researchers use additional community college populations to obtain a greater knowledge of recreational substance use other than alcohol among emerging adults ages 18 to 25 attending community college. It would also be advantageous to use a multi-method technique to gather data for future research. This would help to obtain profound and engaging insight into participants' personal experiences through interviews. Further

research could include the personal growth subscale of the Ryff Scale of Psychological Well-Being, as that may be a more independent construct for this population given the high intercorrelation between autonomy and positive relationships with others. This will ensure that other aspects of psychological well-being are considered as predictors of self-reported substance use other than alcohol. Further research could also control for demographic variables such as age and gender to better understand differences in groups within the targeted population. More research could be conducted with additional community college populations within the Mid-Atlantic region of the United States for a wider understanding of the relationship of sense of autonomy and positive relationships with others in association to self-reported drug use other than alcohol among community college students enrolled at a Mid-Atlantic community college to extend present literature.

Many researchers have indicated the importance of ethnicity in understanding the demographical characteristics in maladaptive behaviors such as recreational substance use (Fagan et al., 2011). Meisel et al. (2015) found European American first-year experience college students tend to engage in recreational substances other than alcohol. Researching ethnicity within self-reported substance use other than alcohol could also support previous and future research in identifying specific characteristics related to self-reported substance use other than alcohol. The research of ethnicity on recreational substance use can also reveal the level of drug education among specific ethnic groups. A pre- and post-test design could also be used to determine the level of education among

community college learners 18 to 25 to determine the developmental need of drug education and prevention programs within the community college.

In contrast the current study and previous studies on self-reported substance use other than alcohol with predictors of age, and their subjective views of their own self-autonomy and positive relationships with, it might be useful to look for other sources of information on the students' behaviors such as stakeholders like administrators and faculty. This information could add to current literature including my study to strengthen the community college knowledge of recreational substance use other than alcohol among community college learners 18 to 25.

Implications

This study presents to students, faculty, and administrators at the community college level information about the importance of peer influences in recreational substance use other than alcohol among emerging adults 18 to 25. The research study information can also provide a guideline of understanding of how peers can support prosocial behavior of academic success or maladaptive behaviors such as substance use other than alcohol on community college campuses. The research study also suggests that relationships between personal autonomy, relationships, and substance use may not be the same as those for students at sophomore or upperclassmen levels or of other age groups (not emerging adults). Further research also could use a longitudinal approach to examine possible change in use and significant predictors across time. In addition, a longitudinal approach could track possible differences between community college

students and 4-year college students in possible future effects of substance use other than alcohol on cognitive skills and academic success.

Conclusion

Substance use other than alcohol among emerging adults 18 to 25 attending community colleges contributes greatly to the social epidemic of nonmedical prescription painkiller use. Self-reported substance use other than alcohol also impedes academic performance through diminished cognitive processes and maladaptive behaviors of class attendance, reducing the successful completion of certificate programs and transitions into four-year institutions. Ongoing drug prevention and education programs are necessary to ensure that 21st century students are aware of the psychological, physiological, and maladaptive behaviors associated to substance use other than alcohol. Research, such as this study, that tries to identify risk factors to these types of substance abuse can also aid community college students, administrators, faculty, and the community in the social change to minimize substance use other than alcohol among community college emerging adults 18 to 25.

If the use of nonmedical prescription painkillers, also identified as substance use other than alcohol, remains recreational among community college students, the national epidemic of nonmedical prescription painkillers will increase the tragedies of substance induced fatalities and poor academic performance among emerging adults 18 to 25. The results from this study supported previous research findings of the importance of psychological well-being as a resilience factor for community college students. This information may be useful to stakeholders, administrators, faculty, mental health

providers, and the community for the development of substance awareness prevention and intervention programs on community college campuses.

Such programs can benefit students, the larger academic community at 2-year institutions, and society by educating students on the variables that influence substance use other than alcohol. The educational programs can also inform students of the maladaptive behaviors associated with illicit substance use such as diminished cognitive capacity (Kanel, 2009), poor academic performance (Whitten, 2014), and diminished daily living skills (Day et al., 2013). In turn, the substance use and prevention programs can lead to positive social change by reducing rates of substance use other than alcohol among community college students (SAMSHA, 2014) and enabling the students to become productive members of society.

References

American Psychiatric Association. (2013). *Diagnostic and atatistical manual of disorders* (5th ed.). Arlington, VA: Author.

American Psychological Association. (2014). APA Ethics code addresses when obtaining Informed consent form research participants is necessary. Retrieved from http://www.apa.org/news/press/releases/2014/06/informed-consent.aspx

American Society of Addiction Medicine. (2014). *The voice of addiction medicine*. Retrieved from http://www.asam.org

Akers, R. (2009). *Social learning and social structure*: *A general theory of crime and deviance*. New Brunswick, NJ: Transaction Publishers.

Akers, R. L., & Jensen, G. F. (2003). *Social learning theory and the explanation of crime: A guide for the new century*. New Brunswick, NJ: Transaction Publishers.

Arria, A. M., Caldeira, K. M., Allen, H. K., Bugbee, B. A., Vincent, K. B., & O'Grady, K. E. (2017). Prevalence and incidence of drug use among college students: an 8-year longitudinal analysis. *The American Journal of Drug and Alcohol Abuse, 5*, 1-8. doi:10.1080/00952990.2017.1310219

Arria, A. M., O'Grady, K. E., Caldeira, K. M., Vincent, K. B., & Wish, E. D. (2010). Nonmedical use of prescription stimulants and analgesics: associations with social and academic behaviors among college students. *Journal of Drug Issues, 38*(4), 1045-1060. doi:10.1177/002204260803800406

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55(*5*),* 469-480. doi:10.1037/0003-

066X.55.5.469

Arnett, J. J. (2014). *Adolescence and Emerging Adulthood: A cultural Approach.* Upper Saddle River, NJ: Prentice Hall. Bandura, A., & Walters, R. H. (1977). Social learning theory. Retrieved from http://www.esludwig.com/uploads/2/6/1/0/26105457/bandura_sociallearningtheory.pdf

Baum, S., Little, K., & Payea, K. (2011). Trends in community college education: Enrollment, prices, student aid, and debt levels. Trends in higher education series. Retrieved from http://trends.collegeboard.org/sites/default/files/trends-2011-community-colleges-ed-enrollment-debt-brief.pdf

Bavarian, N., Flay, B. R., Ketcham, P. L., & Smit, E. (2015). The illicit use of prescription stimulants on college campuses: A theory-guided systematic review. *Health Education & Behavior*, *42*(6), 719-729.

Berger, K. S. (2011). *The Developing person through the life span*. New York, NY: Worth Publisher.

Branson, A., Sanford, F., Dasgupta, C., Graham, J., & Lovette, B. (2011). Project Lazarus: Community-Based overdose prevention in rural North Carolina. *Pain Medicine, 12,* S77-S85. doi:10.1111/j.1526-4637.2011.01128

Brown, E. J., Turovsky, J., Heimberg, R. G., Juster, H. R., Brown, T. A., & Barlow, D. H. (1997). Validation of the social interaction anxiety scale and the social phobia scale across the anxiety disorders. *Psychological Assessment, 9*(1), 21-25. doi:10.1037/1040-3590.9.1.21

Buccelli, C., Della Casa, E., Paternoster, M., Niola, M., & Pieri, M. (2016). Gender differences in drug abuse in the forensic toxicological approach. *Forensic Science International, 265*, 89-95. doi:10.1016/j.forsciint.2016.01.014

Center for Behavioral Health Statistics and Quality. (2015). *Results from the 2014 National Survey on Drug Use and Health: Detailed Tables*. Retrieved from http://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs2014/NSDUH-DetTabs2014.pdf

Centers for Disease Control and Prevention. (2013). *Injury Prevention and Control: Prescription Drug Overdose*. Retrieved from http://www.cdc.gov/drugoverdose/data/overdose.html

Center for Lawful Access and Abuse Deterrence (2014). *Evolution of the epidemic (Part 1)*. Retrieved from http://claad.org/portfolio/evolution-of-the-epidemic-part-1/

Chan, D. (2009). So why ask me? Are self-report data really that bad? In C. Lance & R. Vandenberg (Eds.), *Statistical and Methodological Myths and Urban Legends: Doctrine, Verity, and Fable in the Organizational and Social Sciences* (pp. 309-336). New York, NY: Routledge.

Chiauzzi, E., Donovan, E., Black, R., Cooney, E., Buechner, A., & Wood, M. (2011). A survey of 100 community colleges on student substance use, programming, and collaborations. *Journal of American College Health*, *59*(6), 563-572. doi:1080/07448481.2010.534214

Cicero, T. J., Ellis, M. S., Surratt, H. L., & Kurtz, S. P. (2014). The changing face of heroin use in the United States: A retrospective analysis of the past 50 years.

JAMA Psychiatry, 71(7), 821-826. doi:10.1001/jamapsychiatry.2014.366

College Board Trends in Community College. (2016). Trends in community colleges: Enrollment, prices, student debt, and completion. Retrieved from https://trends.collegeboard.org/sites/default/files/trends-in-community-colleges-research-brief.pdf

Community College Research Center (2016). Community College FAQ's. Retrieved from http://ccrc.tc.columbia.edu/Community-College-FAQs.html

Cook, T. D., Campbell, D. T., & Day, A. (1979). *Quasi-experimentation: design & analysis issues for field settings*. Boston, MA: Houghton Mifflin.

Cotto, J. H., Davis, E., Dowling, G. J., Elcano, J. C., Staton, A. B., & Weise S. R. (2010). Gender effects on drug use, abuse, and dependence: A special analysis of results from the national survey on drug use and health. *Gender Medicine, 7*(5), 402-413. doi:10.1016/j.genm.2010.09.004

Creswell, J. W. (2013). *Research design, qualitative, quantitative, and mixed methods approach* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Day, A. M., Metrik, J., Spillane, N. S., & Kahler, C. W. (2013). Working memory and impulsivity predict marijuana-related problems among frequent users. *Drug and Alcohol Dependence, 131*(1-2), 171–174. doi:10.1016/j.drugalcdep.2012.12.016

Erikson, E. (1980). Identify and the life cycle. New York, NY: W. W. Norton & Company.

Eversman, M. H. (2015). We want a living solution: Views of harm reduction programs in Black U.S. communities. *Journal of Ethnicity in Substance Abuse*, *14*(2), 187-

207. doi:10.1080/15332640.2014.976803

Fagan, A. A., Van Horn, M. L., Antaramian, S., & Hawkins, J. D. (2011). How do families matter? Age and gender differences in family influences on delinquency and drug use. *Youth Violence and Juvenile Justice, 9,* 150-170. doi:10.1177/1541204010377748

Fagan, A. A., Van Horn, M. L., Hawkins, J. D., & Arthur, M. W. (2007). Gender similarities and differences in the association between risk and protective factors and self-reported serious delinquency. *Prevention Science, 8*(2), 115-124. doi:10.1007/s11121-006-0062-1

Feldman, K. A., & Newcomb, T. M. (1969). *The impact of college on students: Analysis of four decades of research*. San Francisco, CA: Jossey-Bass.

Feldman, R. (2014). *Discovering the Lifespan Global* (rev. ed.). Harlow, NJ: Pearson Publication.

Ferrer E., Marks, R. Midarsky, E., & Hutz-Midgett, A. (2015). Substance abuse and pain in a cohort of college students. *Research Journal of Drug Abuse*, 2(1), 1. doi:10.7243/2057-3111-2-1

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. Thousand Oaks, CA: SAGE Publications.

Fisher, B. S., & Lab, P. S. (2015). *Encyclopedia of victimology and crime prevention*. Thousand Oaks, CA: Sage Publications.

Fraser, S., & Moore, D. (2011). *The drug effect: Health, crime, and society*. Cambridge, UK: Cambridge University Press. Retrieved from

http://ebooks.cambridge.org/ref/id/CBO9781139162142

Gomez, R. (2016). Factor structure of the social interaction anxiety scale and the social phobia scale short forms. *Personality and Individual Differences, 96*, 83-87. doi:10.1016/j.paid.2016.02.086

Gostin, L. O., Hodge, J. G., & Noe, S. A. (2017). Reframing the opioid epidemic as a national emergency. *Jama, 318*(16), 1539-1540.

Hansen, R. N., Oster, G., Edelsberg, J., Woody, G. E., & Sullivan, S. D. (2011). Economic costs of nonmedical use of prescription opioids. *The Clinical journal of pain, 27*(3), 194-202. doi:10.1097/AJP.0b013e3181ff04ca

Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning, 11*(1), 19-42. Retrieved from http://itecideas.pbworks.com/w/file/fetch/58620369/Factors%20Associated%20With%20Student%20Persistence%20in%20an%20Online%20Program%20of%20Study.pdf

Hoyt, L. T., Chase-Lansdale, P. L., McDade, T. W., & Adam, E. K. (2012). Positive youth, healthy adults: Does positive well-being in adolescence predict better perceived health and fewer risky health behaviors in young adulthood? *Journal of Adolescent Health, 50*(1), 66-73. doi:10.1016/j.jadohealth.2011.05.002

Hu, X., Primack, B. A., Barnett, T. E., & Cook, R. L. (2011). College students and use of K2: An emerging drug of abuse in young persons. *Substance Abuse Treatment, Prevention, and Policy, 6*(1), 16. doi:10.1186/1747-597X-6-16

Hulme, P. A. (2007). Psychometric evaluation and comparison of three retrospectives, multi-item measures of childhood sexual abuse. *Child Abuse & Neglect, 31*, 853-869. doi:10.1016/j.chiabu.2007.03.01\

Hurd, Y. L., Michaelides, M., Miller, M. L., & Jutras-Aswad, D. (2014). Trajectory of adolescent cannabis use on addiction vulnerability. *Neuropharmacology, 76*, 416-424. doi:10.1016/j.neuropharm.2013.07.028

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenber, J. E. (2013). *Monitoring the Future: National survey results on drug use 1975-2014*. Retrieved from http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2014.pdf

Johnston, L. D., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Miech, R. A. (2014). *Monitoring the Future Occasional Paper 81. Demographic subgroup trends among adolescents in the use of various licit and illicit drugs, 1975–2013*. Retrieved from http://www.monitoringthefuture.org/pubs/occpapers/mtf-occ81.pdf

Katz, D. S., & Davison, K. (2014). Community college student mental health: A comparative analysis. *Community College Review, 42*(4), 307-326. doi:10.1177/0091552114535466

Kandel, D. B. (2002). *Stages and pathways of drug involvement: Examining the gateway hypothesis*. Cambridge, UK: Cambridge University Press.

Khan, S. A., Revicki, D. A., Hassan, M., Locklear, J. C., Friedman, L. A., Mannix, S., & Sheehan, D. V. (2015). Assessing the reliability and validity of the Sheehan

Irritability Scale in patients with major depressive disorder. *The Journal of Clinical Psychiatry*, *77*(8), 1080-1086.

King, R. G. (1952). Narcotics Bureau and the Harrison Act: Jailing the healers and the sick. *Yale LJ*, *62*, 736.

Klainin-Yobas, P., Ramirez, D., Fernandez, Z., Sarmiento, J., Thanoi, W., Ignacio, J., & Lau, Y. (2016). Examining the predicting effect of mindfulness on psychological well-being among undergraduate students: A structural equation modeling approach. *Personality and Individual Differences*, *91*, 63-68. doi:10.1016/j.paid.2015.11.034

Kristen, C. (2010). A journal of law and policy for the information society. *Ohio State University Journal of Law and Policy for the Information Society*, *6*(8), 535-554. doi:10.1177/0091552114535466

Larochelle, M. R., Liebschutz, J.M., Zhang, F., Ross-Degnan, D., & Wharam, J. F. (2016). Opioid prescribing after nonfatal overdose and association with repeated overdose: A cohort study. *Journal of Ann Intern Med*icine, *164*, 1-9. doi:10.7326/M15-0038

Maahs, J. R., Weidner, R. R., & Smith, R. (2016). Prescribing some criminological theory: An Examination of the illicit use of prescription stimulants among college students. *International journal of offender therapy and comparative criminology*, *60*(2), 146-164

Martino, S., Grilo, C. M., & Fehon, D. C. (2000). Development of the drug abuse screening test for adolescents (DAST-A). *Addictive Behaviors*, *25*, 57-70.

doi:10.1016/S0306-4603(99)00030-1

Maynard, C., Graves, M. C., West, I. I., Bumgardner, K., Krupski, A., & Roy-Byrne, P. (2016). Drug use severity, mortality, and cause of death in primary care patients with substance use disorders. *SAGE Open*, *6*(1), 1-6. doi:10.1177/2158244015626225

McCabe, S. E., Boyd, C. J., & Teter, C. J. (2009). Subtypes of nonmedical prescription drug misuse. *Drug and Alcohol Dependence*, *102*(1-3), 63-70. doi:10.1016/j.drugalcdep.2009.01.007

McCabe, S. E., Teter, C. J., & Boyd, C. J. (2016). Medical use, illicit use and diversion of prescription stimulant medication. *Journal of Psychoactive Drugs*, *38*(1), 43-56. doi:10.1080/02791072.2006.10399827

McCabe, S. E., West, B. T., Christian, J. T., & Boyd, C. J. (2014). Trends in medical use, diversion, and nonmedical use of prescription medications among college students from 2003 to 2013: Connecting the dots. *Addictive Behaviors*, *39*, 1176-1182. doi:10.1016/j.addbeh.2014.03.008

McCauley, J. L., Danielson, C. K., Amstadter, A. B., Ruggiero, K. J., Resnick, H. S., Hanson, R. F., . . . Kilpatrick, D. G. (2010). The role of traumatic event history in nonmedical use of prescription drugs among a nationally representative sample of US adolescents. *Journal of Child Psychology and Psychiatry*, *51*(1), 84-93. doi:10.1111/j.1469-7610.2009.02134.x

McDonell, M. G., Graves, M. C., West, I. I., Ries, R. K., Donovan, D. M., Bumgardner, K., & Roy-Byrne, P. (2016). Utility of point-of-care urine drug tests in the

treatment of primary care patients with drug use disorders. *Journal of Addiction Medicine, 10*(3), 196-201. doi:10.1097/ADM.0000000000000220

Meisel, M. K., Clifton, A. D., MacKillop, J., & Goodie, A. S. (2015). A social network analysis approach to alcohol use and co-occurring addictive behavior in young adults. *Addictive Behaviors, 51,* 72-79. doi:10.1016/j.addbeh.2015.07.009

Mertens, D. M. (2015). *Research and evaluations in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (4th ed.). Thousand Oaks, CA: Sage Publications.

Mertler, C. A., & Vanatta, K. A. (2013). *Advanced and multivariate statistical methods: practical application and interpretation* (5th ed.). Glendale: CA: Pyrczak Publishing.

Montgomery, D. C. (2017). *Design and analysis of experiments*. Thousands Oaks, CA: John Wiley & Sons.

National Center for Education Statistics. (2012). *Digest of Education Statistics Population Characteristics*. Retrieved from http://nces.ed.gov/programs/digest/d13/tables/dt13_302.60.asp

National Institute on Drug Abuse. (2014, June 24). *What can we do about the heroin overdose epidemic?* Retrieved from https://www.drugabuse.gov/about-nida/noras-blog/2014/06/what-can- we-do-about-heroin-overdose-epidemic

National Institute on Drug Abuse for Teachers (2017). *Teachers: Classroom resources on drug effects*. Retrieved from https://teens.drugabuse.gov/teachers

National Survey on Drug Use and Health (2015). *Key substance use and mental health*

indicators in the United States: Results from the 2015 National Survey on Drug Use and Health. Retrieved from https://www.samhsa.gov/data/sites/default/files/NSDUH-FFR1-2015/NSDUH-FFR1-2015/NSDUH-FFR1-2015.pdf

Neugarten, B. L., Havighurst, R. J., & Tobin, S. S. (1961). The measurement of life satisfaction. *Journal of Gerontology, 16*, 134-143. doi:10.1093/geronj/16.2.134

Nuckols, T. K., Anderson, L., Popescu, I., Diamant, A. L., Doyle, B., & Di Capua, P. (2014). Opioid prescribing: A systematic review and critical appraisal of guidelines for chronic pain. *Annals of Internal Medicine*, *160,* 38-47. doi:10.7326/0003-4819-160-1-201401070

Okun, M. A., & Kim, G. Y. (2016). The interplay of frequency of volunteering and prosocial motivation on purpose in life in emerging adults. *The Journal of Social Psychology, 156*(3), 328-333. doi:10.1080/00224545.2015.1080657

Park, S. Y., Cha, B., Lim, K., & Jung, S. (2014). The relationship between university student learning outcomes and participation in social network services, social acceptance and attitude towards school life. *British Journal of Educational Technology, 46*(1) 97-111. doi:10.1111/bjet.12013

Pedhazur, E. J., & Schmelkin, L. P. (2013). *Measurement, design, and analysis: An integrated approach*. Washington, DC: Psychology Press.

Peralta, R. L., & Steele, J. L. (2010). Nonmedical prescription drug use among US college students at a Midwest university: A partial test of social learning theory. *Substance Use & Misuse, 45*(6), 865-887. doi:10.3109/10826080903443610

Pilkinton, M., & Cannatella, A. (2012). Nonmedical use of prescription stimulants: Age, race, gender, and educational attainment patterns. *Journal of Human Behavior in the Social Environment*, *22*(4), 409-420. doi:10.1080/10911359.2012.664968

Pope Jr., H., Ionescu-Pioggia, M., & Pope, K. (2014). Drug use and life style among college undergraduates: A 30-year longitudinal study. *Journal of Psychiatry, 158*, 1519-1521. doi:10.1176/appi.ajp.158.9.1519

Ravert, R. D., Schwartz, S. J., Zamboanga, B. L., Donnellan, M. B., Kim, S. Y., Weisskirch, R. S., & Bersamin, M. M. (2013). The association between sensation seeking and well-being among college-attending emerging adults. *Journal of College Student Development, 54*(1), 17-28. Retrieved from http://search.proquest.com/docview/1323044586?accountid=14872

Reboussin, B., Green, K., Milam, A., Furr-Holden, D., Johnson, R., & Ialongo, S. (2015). The role of neighborhood in urban black adolescent marijuana use. *Drug and Alcohol Dependence, 154*, 69-75. doi:10.1016/j.drugalcdep.2015.06.029

Redford, A., & Powell, B. (2016). Dynamics of Intervention in the War on Drugs: The Build-Up to the Harrison Act of 1914. *The Independent Review, Spring 2016*.

Rhew, I. C., Hawkins, J. D., Murray, D. M., Fagan, A. A., Oesterle, S., Abbott, R. D., & Catalano, R. F. (2016). Evaluation of community-level effects of communities that care on adolescent drug use and delinquency using a repeated cross-sectional design. *Prevention Science, 17*(2), 177-187. doi:10.1007/s11121-015-0613-4

Ridner, S. L., Newton, K, S., State, R. R., Crawford, T. N., & Hall, L. A. (2016). Predictors of well-being among college students. *Journal of American College*

Health, *64*(2), 116-124. doi:10.1080/07448481.2015.1085057

Rigg, K., & Monnal., S. (2014). Urban vs. rural differences in prescription opioid misuse among adults in the United States: Informing region specific drug polices and interventions. *International Journal of Drug Policy*, *25*(3), 941-937. doi:10.1016/j.drugpo.2014.10.001\

Rigg, K. K. (2015). Comparing characteristic of prescription painkiller misusers and heroin users in the United States. *Addictive Behaviors, 51,* 106-112. doi:10.1016/j.addbeh.2015.07.013

Rosenberg, S. D., Drake, R. E., Wolfrod, G. L., Mueser, K. T., Oxman, T. E., Vidaver, R. . . . Luckor, R. (1998). Dartmouth assessment of lifestyle Instrument (DALI): A substance use disorder screen for people with severe mental illness. *American Psychiatry Journal*, *155*(2), 232-238. doi:10.1037//0893-164x.13.4.313

Ryff, C. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Psychology*, 57(6), 1069-1081. doi:10.1037/0022-3514.57.6.1069

Ryff, C. D. (2014). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and Psychosomatics, 83*(1), 10-28. doi:10.1159/000353263

Seifert, T. (2005). *The Ryff scales of psychological well-being*. Retrieved from http://www.liberalarts.wabash.edu/ryff-scales/

Selzer, M. (1971). The Michigan Alcoholism Screening Test: The quest for a new diagnostic instrument. *The American Journal of Psychiatry, 127(12),* 1653-1658.

doi:10.1776ajp.127.12.1653

Salkind, N. J. (2010). *Encyclopedia of research design*. Thousand Oaks, CA: Sage Publications.

Schepis, T. S., Tapscott, B. E., & Krishnan-Sarin, S. (2016). Stress-related increases in risk taking and attentional failures predict earlier relapse to smoking in young adults: A pilot investigation. *Experimental and clinical psychopharmacology, 24*(2), 110

Schepis, T. S., West, B. T., Teter, C. J., & McCabe, S. E. (2016). Prevalence and correlates of co-ingestion of prescription tranquilizers and other psychoactive substances by US high school seniors: Results from a national survey. *Addictive behaviors, 52*, 8-12. doi:10.1016/j.addbeh.2015.08.002

Schinke, S., Schwinn, T., Hopkins, J., & Wahlstrom, L. (2016). Drug abuse risk and protective factors among Hispanic adolescents. *Preventive Medicine Reports, 3*, 185-188. doi:10.1016/j.pmedr.2016.01.012

Shah, I., & Siddiqui, F. A. (2015). *Gender difference of psychological well-being among university students*. Thousand Oaks, CA: Sage Publications.

Skinner, H. A. (1982). The drug abuse screening test. *Addictive behaviors, 7*(4), 363-371. doi:10.1016/0306-4603(82)90005-3

Skinner, H. A. (1994). *Computerized lifestyle assessment manual*. Toronto, ON: Addiction Research Foundation.

Skinner, H. A., & Allen, B. A. (1982). Alcohol dependence syndrome: Measurement and validation. *Journal of abnormal psychology, 91*(3), 199-205. doi:10.1037/0021-

843X.91.3.199

Skinner, H. A., & Pakula, A. (1986). Challenge of computers in psychological assessment. *Professional Psychology: Research and Practice, 17*(1), 44-42. doi:10.1037/0735-7028.17.1.44

Skinner, D. (2001). Assessment of substance abuse: Drug abuse screening test (DAST). *Encyclopedia of drugs, alcohol, and addictive behaviors, 2*. Retrieved from http://www.encyclopedia.com/education/encyclopedias-almanacs-transcripts-and-maps/assessment-substance-abuse-drug-abuse-screening-test-dast

Smith, P. C., Schmid, S. M., Allensowrth-Davies, D., & Saltz, R.,(2010). A single-question screening test for drug use in primary care. *Internal Medicine Internal Medicine Journal, 170*(13), 1155-1160. Retrieved from http://archinte.jamanetwork.com/article.aspx?articleid=225770

Smith, D. C., Davis, J. P., Ureche, D. J., & Dumas, T. M. (2016). Six-month outcomes of a peer-enhanced community reinforcement approach for emerging adults with substance misuse: a preliminary study. *Journal of Substance Abuse Treatment, 61*, 66-73. doi:10.1016/j.jsat.2015.09.002Substance Abuse and Mental Health Data. (2011). *2010 National Survey on Drug Use and Health: Public Use File Codebook*. Retrieved from http://www.icpsr.umich.edu/icpsrweb/NAHDAP/studies/36361

Substance Abuse and Mental Health Service Administration–Center for Integrated Health Solutions. (2016). *Drug and alcohol use screening tools*. Retrieved from http://www.integration.samhsa.gov/clinical-practice/screening-tools#drugs

Teter, C., McCabe, S., LeGrange, K., Cranford, J., & Boyd, C. (2006). Illicit use of specific prescription stimulants among college students: Prevalence, motives, and routes of administration. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, *26*, 1201-1510. doi:10.1592/phco.26.10.1501

Theron, L. C., & Liebenberg, L. (2015). Understanding cultural contexts and their relationship to resilience processes. In L. C. Theron, L. Liebenberg, & M. Ungar (Eds.), *Youth Resilience and Culture* (pp. 23-36). Netherlands: Springer.

Ungar, M., Liebenberg, L., Dudding, P., Armstrong, M., & Van de Vijver, F. J. (2013). Patterns of service use, individual and contextual risk factors, and resilience among adolescents using multiple psychosocial services. *Child Abuse & Neglect*, *37*(2), 150-159. doi:10.1016/j.chiabu.2012.05.007

U. S. Department of Human Services, National Institute of Health Collaborative Research on Addiction Institute (2014). *Using social media to better understand, prevent, and treat substances use*. Retrieved from http://www.nih.gov/news/health/oct2014/nida-17.htm

U. S. Department of Health and Human Services, National Institute of Health, National Institute on Drug Abuse (2017). *Parents and educators*. Retrieved from https://www.drugabuse.gov/parents-educators

U. S. Federal Drug Enforcement Administration (2016). *National drug threat assessment summary*. Retrieved from https://www.dea.gov/resource-center/2016%20NDTA%20Summary.pdf

Veliz, P., Epstein-Ngo, Q., Zdroik, J., Boyd, C. J., & McCabe, S. E. (2016). Substance

use among sexual minority collegiate athletes: a national study. *Substance use & misuse, 51(4*), 517-532 doi:10.3109/110826084.2015.1126741

Vogt P. W, & Johnson, B. R. (2016). Dictionary of statistics and methodology. A nontechnical guide for the social sciences (5th ed.). Thousand Oaks, CA: SAGE Publications.

Waterman, A. S., Schwartz, S. J., Zamboanga, B. L., Ravert, R. D., Williams, M. K., Agocha, V. B., . . . Donnellan, M. B. (2010). The questionnaire for eudaimonic well-being: Psychometric properties, demographic comparisons, and evidence of validity. *Journal of Positive Psychology, 5,* 41-61. doi:10.1080/17439760903435208

Watkins, W. C. (2016). A social learning approach to prescription drug misuse among college students. *Deviant Behavior, 37*, 601-614. doi:10.1080/01639625.2015.106079

Wheeler, E., Jones, S., Gildert, M. K., & Davidson, P. J. (2014) *Opioid overdose prevention programs providing naloxone to laypersons: Morbidity and Mortality Weekly Report (MMWR).* Retrieved from http://origin.glb.cdc.gov/mmwr/preview/mmwrhtml/mm6423a2.htm?s_cid=mm6423a2_w

White, B. P., Becker-Blease, K. A., & Bishop, K. G. (2014). Nonmedical use of prescription stimulants: age, race, gender, and educational attainment patterns. *Journal of Human Behavior in the Social Environment, 22*, 409-420. doi:10.1080/10911359.2012.664968

Whitten, L. (2014). NIDA NOTES National Institute on Drug Abuse. *Department of Health and Human Services*, *20*(4), 1–15. Retrieved from https://www.drugabuse.gov/news-events/nida-notes

Wilkinson, A. L., Halpern, C. T., & Herring, A. H. (2016). Directions of the relationship between substance use and depressive symptoms from adolescence to young adulthood. *Addictive Behaviors*, *60*, 64-70. doi:10.1016/j.addbeh.2016.03.036

Winick, C. (1991). Social behavior, public policy, and nonharmful drug use. *The Milbank Quarterly*, *69*, 437-459. Retrieved from http://www.jstor.org/stable/3350104

Yu, A. Y., Tian, S. W., Vogel, D., & Kwok, R. C. (2010). Can learning be virtually boosted? An investigation of online social networking impact. *Computers & Education*, *55*, 1493-1503. doi:10.1016/j.compedu.2010.06.015

Yudko, E., Lozhkina, O., & Fouts, A. (2007). A comprehensive review of the psychometric properties of the drug abuse screening test. *Journal of substance abuse treatment*, *32*(2), 189-198. doi:10.1016/j.jsat.2006.08.002

Zacny, J. Bigelow, G., Compton, P., Foley, K., Iguchi, M., & Sannerud, C. (2003). College on problems of drug dependence taskforce on prescription opioid non-medical use and abuse: Position statement. *Drug and Alcohol Dependence, 69(3) 215-232*. doi10.1016/S0376-8716(03)00003-6

Zung, W. W., Richards, C. B., & Short, M. J. (1965). Self-rating depression scale in an outpatient clinic: Further validation of the SDS. *Archives of general psychiatry*, *13*(6), 508-515. doi:10.1001/archpsyc.1965.01730060026004

Appendix A: Drug Abuse Screening Test (DAST-10) Approval

The Drug Abuse Screen Test (DAST-10) was designed to provide a brief, self-report instrument for population screening, clinical case finding, and treatment evaluation research. It can be used with adults and older youth.

The DAST-10 yields a quantitative index of the degree of consequences related to drug abuse. The instrument takes approximately 5 minutes to administer and may be given in either a self-report or interview format. The DAST may be used in a variety of settings to provide a quick index of drug abuse problems.

The DAST-10 is a 10-item self-report instrument that has been condensed from the 28-item DAST. It was copyrighted in 1982 by Harvey Skinner, PhD, and the Centre for Addiction and Mental Health, Toronto, Canada. It is a public use instrument that may be reproduced for non-commercial use (clinical, research, training purposes) as long as credit is given to author Harvey A. Skinner, Department of Public Health Sciences, University of Toronto https://www.drugabuse.gov/sites/default/files/dast-10.pdf

Appendix B: Ryff Scale of Psychological Well-Being Approval

Greetings,

Thanks for your interest in the well-being scales. I am responding to your request on behalf of Carol Ryff. You have her permission to use the scales. They are attached in the following files (both are Word 97-2003 documents):

-"14 Item Instructions" lists all 14 items for each of the six scales of well-being (14x6=84 items), and includes information about shorter options, scoring, and psychometric properties, plus a list of published studies using the scales. (See the publications by C. D. Ryff if you need more background information about the scales.)

-"14-item Questionnaire" is a formatted version of the full instrument with all 84 items. (This file will need to be modified if you choose a shorter length option- see the "14 Item Instructions" for which questions to include. We do not have formatted shorter instruments to send out.)

Please note, Dr. Ryff strongly recommends that you NOT use the ultra-short-form version (3 items per scale, 3 x 6=18 items). That level of assessment has psychometric problems and does not do a good job of covering the content of the six well-being constructs.

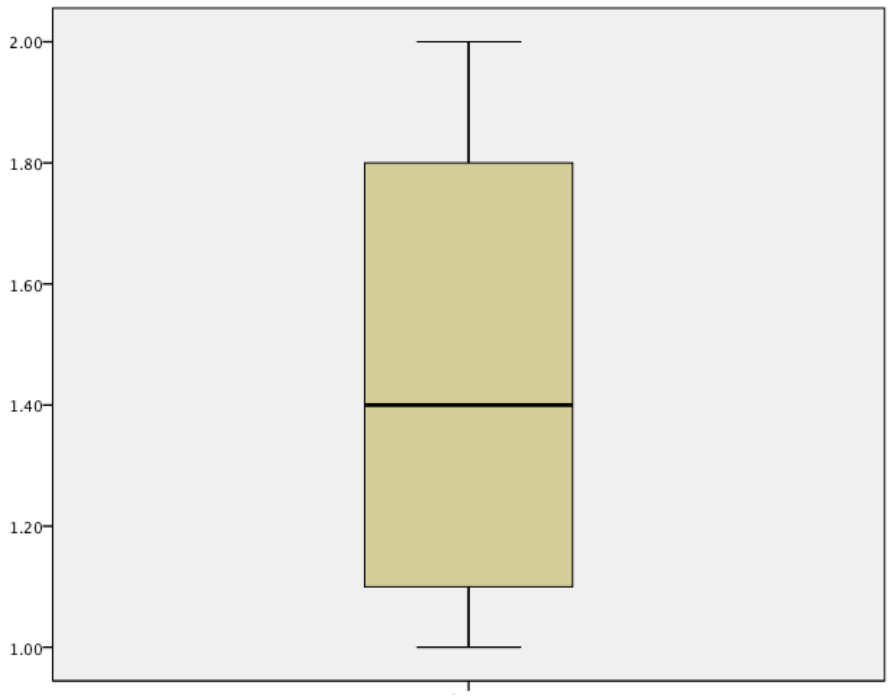
There is no charge to use the scales, but we do ask that you please send us copies of any materials you may publish using the scales to [redacted]

Best wishes for your research,

Administrative Assistant

Appendix C: DAST-10 Drug Abuse Boxplot

This boxplot shows that there were no outliers for the DAST-10 scores.



Appendix D: Ryff Autonomy Subscale Graphs

This boxplot shows that there were no outliers for the Ryff Autonomy subscale

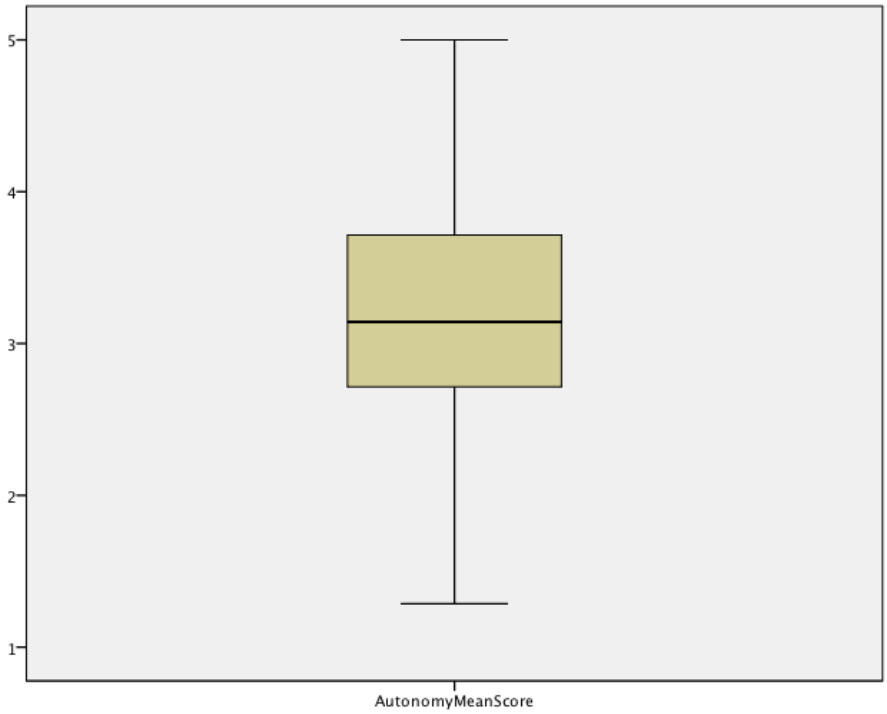


Figure E1. Autonomy subscale boxplot.

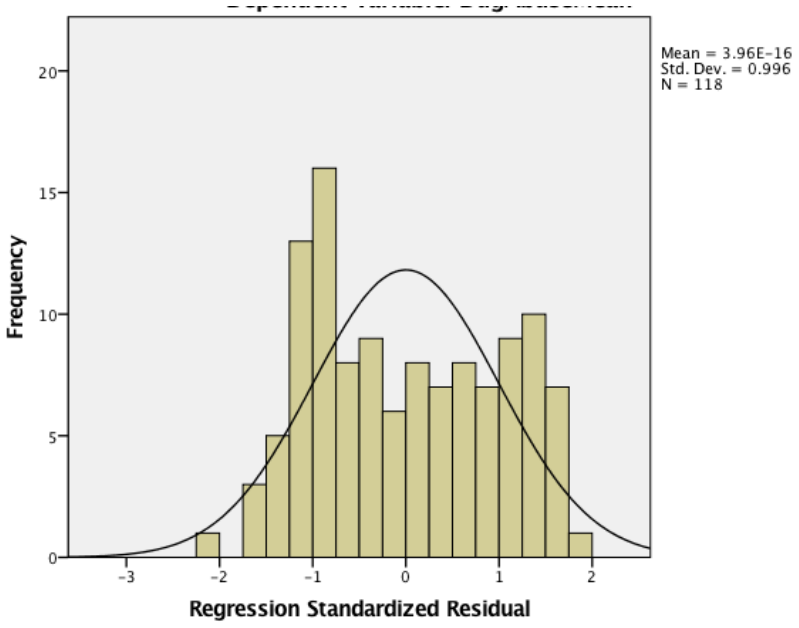


Figure E2. Autonomy subscale (histogram) DAST-10 (DV).

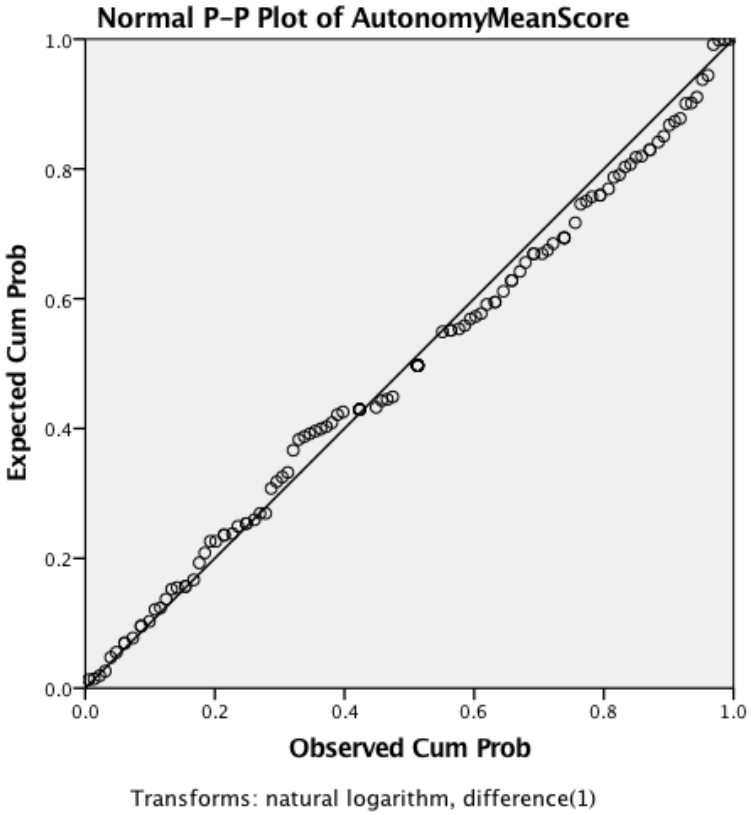


Figure E3. Autonomy P-P Plots DAST-10 (DV).

Appendix E: Ryff Positive Relationships with Others

This boxplot shows that there were no outliers for the Ryff Positive Relations with others subscale

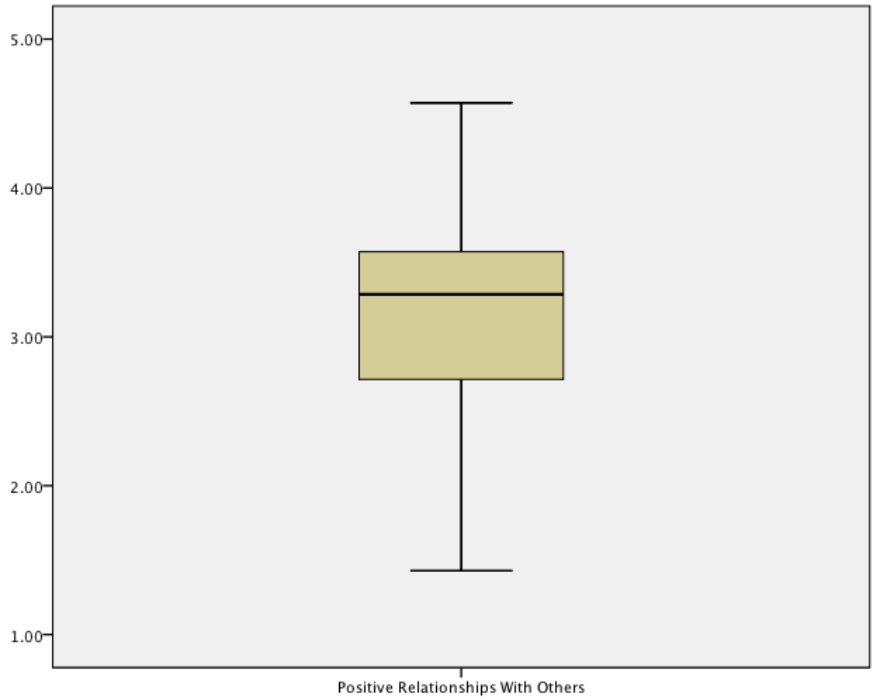


Figure F1. Positive relationships with others subscale boxplot.

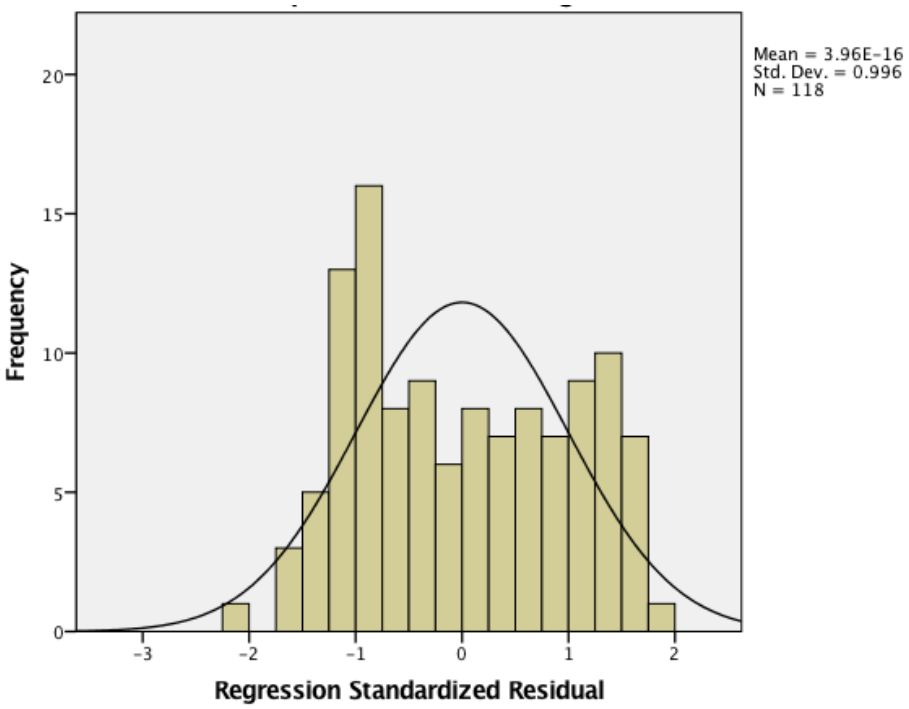


Figure F2. Positive relationships with others histogram DAST-10 (DV).

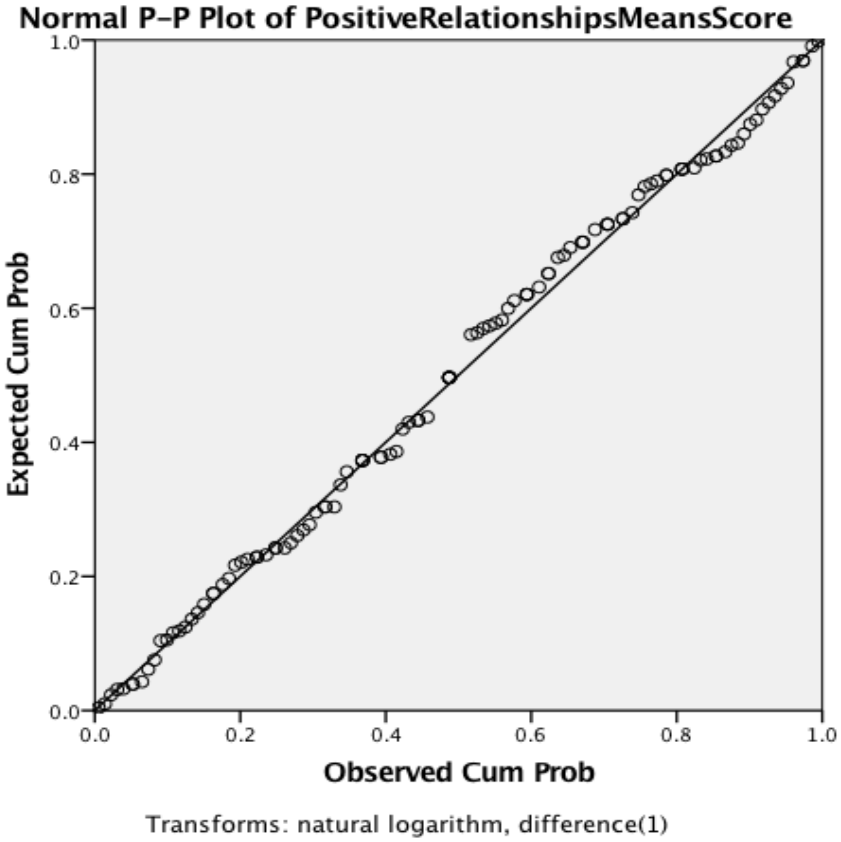
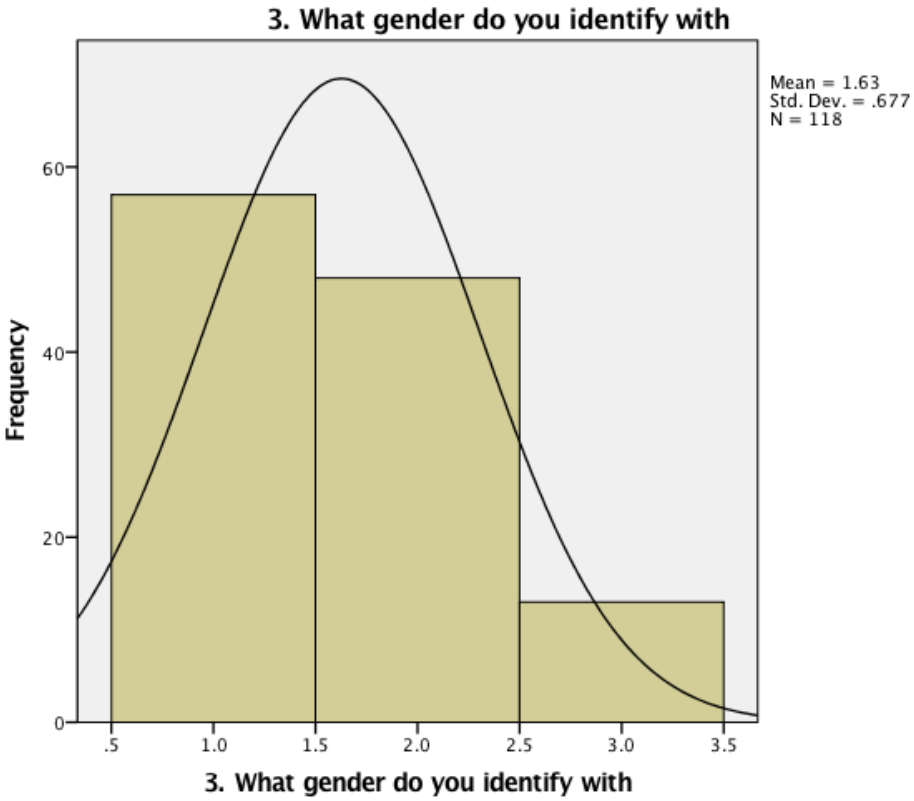


Figure F3. Positive relationships with others P-P Plots DAST-10 (DV).

Appendix F: Gender Data Graph



Appendix G: DAST-10 Linear Regression P-P Plots