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Parents' Knowledge of Child-Passenger Safety and Child-Passenger Restraint Usage

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Walden University
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Abstract

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By

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MPH, Morehouse School of Medicine, 2000

BA, Fisk University, 1997

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Although occupant protection laws exist, limited research has been conducted on how current child passenger safety (CPS) issues and CPS marketing strategies relate to child passenger safety seat (CPSS) usage. The purpose of this cross-sectional study was to analyze the relationship between parents' perception and knowledge of CPS issues and CPSS usage rates. The diffusion of innovation and the social marketing theories provided the frameworks for this study. The overall research question for the study examined the correlation between parents' knowledge of CPS issues and CPSS usage. Data (participants' surveys, car seat check-up information, and observational statistics) were collected from events that occurred in 3 locations across the county. The population consisted of a convenience sample of adults (parents of children 8-years-old and younger) from each of the locations. The study survey was distributed to 93 participants and only 71 surveys (76.34%) were received for analysis. Data analysis methods included deductive coding, Cronbach's alpha, descriptive statistics, hypotheses testing, linear regression, and Pearson Correlation. The overall test results showed that there were no significant relationships between the independent variable predictors (parents' knowledge of proper CPSS installation techniques, CPS laws and regulations, and marketing strategies) and the dependent variable (CPSS usage rates). The overall study was not statistically significant. The study should be replicated, however modified (on a larger scale for a longer period). Thus, having a stronger possibility to impact the community (producing noteworthy results and promoting social change).

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Dedication

This study is dedicated to my mother and father, Margaret and David Cadore. It is also dedicated to my loving son, Mickeal, as well as all of my loving family and friends who have consistently encouraged and supported me throughout this entire journey. Thank you for always being there for me with your inspiring words and prayers.

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Chapter 1: Introduction to the Study

Introduction

Motor vehicle casualties (primarily affecting children) are among major causes of deaths and injuries (Safe Kids Worldwide, 2014b). Children are affected by an unintentional incident approximately every 30 seconds (Safe Kids Worldwide, 2014b). There is an inconsistent balance between the number of passengers in the vehicle and the number of passengers who use the occupant restraint system (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a). Some older occupants (adults 18-years-old or older) do not adequately use seatbelts in the front seats of the vehicle (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a; Safe Kids Worldwide, 2014b).

In Georgia, child-related motor vehicle deaths and injuries are a growing phenomenon, especially in metropolitan communities (Fulton County Georgia Government, 2011). This phenomenon could be attributed to the growing number of vehicles on the roadways (Fulton County Georgia Government, 2011; Georgia's Governor's Office of Highway Safety, 2014c). Limited studies exist on the correlation between parents' knowledge and experience of child passenger safety seat (CPSS) as well as the enforcement and administration of CPSS-related laws and policies. Various occupant laws including those centered on child passenger safety (CPS), are currently present, but do not efficiently influence parents and transporters of children. In addition, there has been limited research into the relationship or causation in relation to parents'

perception and knowledge of CPS issues and child passenger restraint usage rates. In this study, I aimed to determine if there is a relationship between CPSS usage (dependent variable) in Fulton County Georgia, and the parent's knowledge/understanding of proper installation techniques, CPSS laws, and CPS marketing strategies (independent variables).

Chapter 1 of this study includes information regarding the background of the study including a problem statement, the purpose of the study, and the research questions. This chapter provides the theoretical framework; the nature of the study; operational definitions; the assumptions, scope, delimitations, and limitations of the study; and the significance of the study. In addition, this chapter entails a justification for additional/further research pertaining to CPSS compliance issues.

Background of the Study

Mortality and morbidity rates from traffic-related issues nationally are high, particularly in children (Safe Kids Worldwide, 2014b). Safe Kids Worldwide (2014b) stated that "a child dies from an unintentional injury every 30 seconds, and millions of children are injured in ways that can affect them for a lifetime" (para.1). This fact could be attributed to the nonuse of vehicle's occupant protection system as well as the limited use of CPSS (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a).

Motor vehicle-related deaths and injuries are attributed to several factors, including external behavioral issues such as substance abuse. Approximately 25% of traffic-related child mortalities were associated with the influence of alcohol or other

forms of substance use (Ernstberger et al., 2015). Of this figure, roughly 50% of the children were also vehicle occupants (Georgia Governor's Office of Highway Safety, 2015). Other external factors include the large number of nonuse/misuse of CPSS, as well as the limited knowledge and understanding of CPSS compliance (Polli & Polli, 2015; Safe Kids Worldwide, 2014b).

Gaps and/or Deficiencies in Prior Research

Although CPS is a topic of concern, limited research has been conducted on how current CPS issues as well as CPS marketing strategies relate to CPSS usage. Nationally and locally, child occupant deaths and injuries have been associated with the limited use of CPSS. Although CPSS regulations have been put in place, the laws have not adequately elicited the proper usage of these seats. The relatively low use of proper seatbelts could be due to insufficient CPSS education efforts and marketing techniques playing a factor in the increased child-related morbidity and mortality rates (Georgia Governor's Office of Highway Safety, 2014a).

Supporting Data

Nationally, motor vehicle incidences are the primary cause of morbidity and mortality in children between the ages of 2-14 years (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a). On average, there are a total of 9% (253,000) of motor vehicle incidences, of which 8% (220,000) directly involves child occupants (children under the age of 15 years; National Center for Statistics & Analysis-Traffic Safety Facts 2005a).

In Georgia, in 2005, roughly 347,653 traffic incidences occurred resulting in 139,056 traffic-related injuries and 1,744 deaths (Georgia Governor's Office of Highway Safety, 2014b). This was a 58% escalation from preceding years (Georgia Governor's Office of Highway Safety, 2014b). In addition, between 2000 and 2005, Georgia's "unintentional injury death rate was 17.8 per 100,000 population while the national rate was 15.0 per 100,000 population. Transportation-related injuries had the highest death rate among children 0 to 19 years of age (1.5 per 100,000 population)" (Centers for Disease Control and Prevention, 2009, para 1). In 2005, the medical costs related to traffic incidences was $1.5 billion, of which $82 million resulted from child-related incidences (New Georgia Encyclopedia, 2014). In the following years, between 2008 and 2012, roughly 4,598 child-related motor vehicle fatalities occurred, with 30% of the child occupants being not restrained (Fulton County Georgia Government, 2011). In 2011 alone, there were approximately 877 motor vehicle-related deaths, of which 29% occurred in the metropolitan Atlanta vicinity, including Fulton County (Fulton County Georgia Government, 2011).

Fulton County, the home of the state capital, Atlanta, is the largest county in the state of Georgia. As of 2014, its population was 920,581 (Fulton County Georgia Government, 2011). In line with national and state trends, the county also has motor vehicle incidences disproportionately affecting child occupants (especially children 14-years-old and under). From 2005-2007, there were roughly 1,773 traffic-related child injuries and 63.77% traffic-related child deaths in the county (Fulton County Georgia

Government, 2011). In 2011, there were approximately 61 occupant-related deaths, the largest for any county (Fulton County Georgia Government, 2011). This number rose to 97 in 2012 with 1,018,544 child-centered hospital discharges (Fulton County Georgia Government, 2011). These figures could be accredited to several influences such as limited access to CPSS education, materials, and resources; limited promotion of CPSS health messages (marketing strategies); limited knowledge and awareness of proper transportation in all-terrain vehicles (ATVS); and limited perception of risk (Centers for Disease Prevention and Control, 2014a; Fulton County Georgia Government, 2011; Georgia Governor's Office of Highway Safety, 2014c; New Georgia Encyclopedia, 2014; Online Analytical Statistics Information Systems, 2014; Safe Kids Fulton County [SKFC], 2010).

Children tend to have an increased vulnerability to injury because of their developing cognitive and motor ability. Children are unable to properly evaluate risk and the attendant injury; they possess limited coordination skills and reaction times and hold reduced motor precision, or the inability to move their body in a correct or precise fashion (staying clear from harm). Toddlers withstand a high percentage of motor vehicle-related deaths and injuries due to their miniature stature (Grossman, 2000). In addition, children who reside in high density populated areas, such as urban settings and crowding in the home, are usually of lower socioeconomic status; maintain poor adult supervision; and play in unsafe crowded areas, making them have a greater chance of suffering from an injury (Grossman, 2000). External behavioral factors include the use of

alcohol and other substances, the misperception of proper CPSS installation and utilization, and the non-use of the vehicle's occupant restraint system by adult drivers/riders (Grossman, 2000; National Safe Kids Campaign, 2014).

Roughly 25% of traffic incidences involving children have been linked to substance use, of which 50% included child occupants (Centers for Disease Control and Prevention, 2014a). In addition, although approximately 96% of drivers, comprising of parents and caregivers assume that their CPSS was properly installed and used according to the CPSS manufacturer's instructions, there is an 82% misuse rate (National Safe Kids Campaign, 2014). Approximately a third of child occupants used the inappropriate CPSS for their size and age (National Safe Kids Campaign, 2014). Also, the use of the vehicle's occupant restraint systems has been positively correlated with the use of CPSS. Roughly 40% of vehicle drivers who did not use the vehicle occupant restraint system did not use a CPSS (National Safe Kids Campaign, 2014). Centers for Disease Prevention and Control (2014a) stated,

> Approximately 14% of children ages 14 and below ride unrestrained, placing them at twice the risk of death and injury of those riding restrained. Children are also at risk of injury when drivers violate stop sign and pedestrian right-of-way laws. Each year stop sign violations are associated with approximately 200 fatal crashes and 17,000 non-fatal injury. (para 1)

The presented supporting data and research findings provide a justification for the study. A review of current research findings provide a rationale for the need of proper

CPSS education and marketing strategies coupled with sufficient CPSS policy enforcement. This study could help to alleviate child-centered motor vehicle deaths and injuries both nationally and locally.

Problem Statement

The concept of unintentional injuries has gained public health interest throughout the past years (Georgia Governor's Office of Highway Safety, 2014b). Child-related motor vehicle deaths and injuries are a growing phenomenon, especially in metropolitan communities. The number of death and injuries could be attributed to the growing number of vehicles present on the roadways (Weatherwax et al., 2015; Zonfrillo et al., 2015).

Unintentional injury is also health concern in Georgia (Georgia Governor's Office of Highway Safety, 2014b). Annually in Georgia, roughly 40 children between the ages of 5 and 12 are involved in a traffic related fatality. Atlanta represents 29% of the overall fatality rates (Fulton County Georgia Government, 2011). Fulton County accounted for 61 deaths, the highest number among the counties within the state (Fulton County Georgia Government, 2011). These issues could be related to the limited knowledge and enforcement of CPSS laws and regulations (Georgia Governor's Office of Highway Safety, 2014a; Georgia Governor's Office of Highway Safety, 2014e). These laws may not efficiently influence the proper use of CPSS. This lack of proper use could be due to the lack of understanding of parents' perception and knowledge regarding CPS issues

(Fulton County Georgia Government, 2011; Georgia Governor's Office of Highway Safety, 2014a; Georgia Governor's Office of Highway Safety, 2014e).

Purpose of the Study

The purpose of this study was to supply an evaluation of the influences related to CPSS use in Fulton County, Georgia. Fulton County Georgia was selected due to the convenience of conducting the study. This level of convenience was primarily due to the interest and relationship (membership on the advisory board) I had with the SKFC as well as with Fulton County Police and Fire Departments. SKFC is a local entity that is part of Safe Kids Georgia and Safe Kids Worldwide. The primary goal of Safe Kids is to prevent (and reduce) unintentional injuries that may affect children 14-years-old and younger. Their goal is achieved through community collaborations, support, education, and policy enforcement (Fulton County Georgia Government, 2011; Safe Kids Worldwide, 2014a).

Importance of the Study

In this study, I focused on how current CPS issues as well as CPS marketing strategies relate to CPSS usage. An analysis was performed through the investigation of attitudes and perceptions of CPSS use, knowledge level for CPSS and CPSS laws, and the conditions surrounding the CPSS-related incidences. The information gained could assist with developing appropriate guidance towards the reduction of CPSS casualties.

Research Questions and Hypotheses

The overarching research question for this study was the following: What is the correlation between parents' knowledge of CPS issues and child-passenger restraint usage?

Research Question 1

What is the correlation between parents' knowledge/understanding of proper CPSS installation techniques and parents' use of CPSS?

$H_0$1: There is no correlation between parents' knowledge/understanding of proper CPSS installation techniques and parents' use of CPSS.

$H_1$1: There is a statistically significant correlation between parents' knowledge/understanding of proper CPS installation techniques and parents' use of CPSS.

Research Question 2

What is the correlation between parents' knowledge/understanding of CPS laws and regulations (policies and enforcement strategies) and parents' use of CPSS?

$H_0$2: There is no correlation between parents' knowledge/understanding of CPS laws and regulations (policies and enforcement strategies) and parents' use of CPSS.

$H_1$2: There is a statistically significant correlation between parents' knowledge/understanding of CPS laws and regulations (policies and enforcement strategies) and parents' use of CPSS.

Research Question 3

What is the correlation between parents' knowledge/understanding of CPS marketing strategies and parents' use of CPSS?

$H_0$3: There is no relationship between parents' knowledge/understanding of CPS marketing strategies and parents' use of CPSS.

$H_1$3: There is a statistically significant correlation between parents' knowledge/understanding of CPS marketing strategies and parents' use of CPSS.

I explored if a significant relationship(s) existed between CPS issues and CPS marketing strategies on CPS usage rates (and, if so, what is the nature of the relationship). I attempted to control for gender, socioeconomic status (SES) levels, ethnicity, and education levels.

Theoretical and/or Conceptual Framework for the Study

I applied the diffusion of innovation (DOI) theory and the social marketing theory as the conceptual framework for the promotion of parents' use of CPSS. The DOI was applicable to the following variables for the study: parents' knowledge/understanding of proper installation techniques, parents' knowledge/understanding of CPS marketing strategies, parents' knowledge/understanding of CPSS laws and regulations (policy and enforcement strategies), CPSS laws and regulations (policy and enforcement strategies), as well as parents' restraint use. The DOI was used to show if there were gaps between CPSS parental education and practice and CPSS enforcement; and if so, how these factors were related to CPSS use. I also attempted to show if through proper and early

education on CPSS issues, parents were more informed and possess a higher probability of understanding CPSS concerns, ultimately leading to increased CPSS usage rates.

The social marketing theory was applicable to the following variables for the study: parents' knowledge/understanding of CPS marketing strategies, parents' knowledge/understanding of CPSS laws and regulations (policy and enforcement strategies), CPS marketing strategies, as well as parents' restraint use. The social marketing theory was used within this research to portray if there was a lack of proper CPSS marketing and enforcement strategies. Within the past recent years, there has been a push on motor vehicle safety throughout the state of Georgia. However, these efforts did not adequately concentrate on all aspects of traffic safety. Most of the attention was placed on topics related to motorcycle safety and impaired and/or aggressive driving.

In addition, the state of Georgia emphasized driving issues related to age-specific groups (teenage drivers and older-age drivers) as well as general occupant protection campaigns (eg., Click It or Ticket). Little focus has been geared towards CPSS issues and concerns. Through the use of the social marketing theory, attempts were made to demonstrate that through proper marketing and advertising techniques, as well as through the use of social systems, CPSS usage rates could be altered and modified. These theories have been applied in the areas of preventive health behavior and compliance with systems (Allen-Greil, 2015; Bryant-Stephens, Garcia-Espana, & Winston, 2013; Frost et al., 2008).

Nature of the Study

This study was a cross-sectional, quantitative research design study. The study was expected to provide an in-depth analysis of the factors relating to CPSS use in Fulton County, Georgia. Quantitative data consisted of measurements that could be transcribed into numerical formats (such as Likert scale test, surveys, and questionnaires; Simply Psychology, 2008). The analysis plan included confirmatory, statistical methods held in natural settings.

A quantitative study is classified as the numerical representation of research objectives geared towards scientific explanation (or hypothesis testing). It includes deductive reasoning and could be best categorized as either surveys or experiments. Surveys are "designed to provide quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of the population" (Creswell, 2003, p. 153). The term surveys could represent various data instrumentations including actual surveys, questionnaire (close-ended), test (pre/post), and various formative/process evaluation materials (e.g., sign in sheets, activity reports; Babbie, 2004; Scibd, 2014).

Some advantages of using quantitative research designs are the ability to associate/generalize assessment information with the actual study with limited opportunity for data interpretation error) and provide a standardized method of analysis. It "can reach a large number of people relatively easily and economically, provide quantifiable answers, relatively easy to analyze, and is less time consuming than interview or observation" (Scibd, 2014, p. 5).

Another advantage with using quantitative research design (as well as survey methods) is the ability to gain information with limited personal and interview biases. Interview bias deals with how the administrator or interviewer delivers the questions. Some aspects of interview bias are the interviewer's appearance and demeanor, familiarity with the questionnaire, exact wording and recording of both the questions and the responses, probing, and coordination/control (training, specification, and mock interviews; Babbie, 2004; Simply Psychology, 2008).

Although quantitative studies possess some strengths, they also have disadvantages. Some disadvantages with using quantitative research design are that investigators cannot acquire a true sense of the population (not fully grasping detailed information/concerns regarding the population). This is true when using surveys. Quantitative research may acquire superficial data. Learn Higher (2008) stated,

> The research is often carried out in an unnatural, artificial environment; preset answers will not necessarily reflect how people really feel about a subject; and the development of standard questions by researchers can lead to 'structural' bias and false representation. (para 1)

Also, quantitative researchers do not take into consideration delayed treatment, ethical concerns, and possible response bias (Ijaz, 2004; Runyan, 2004).

Additional challenges associated with conducting quantitative research are the availability of the information and acquiring up-to-date information. Although quantitative data sources are robust and filled with vast amount of information,

sometimes it could be challenging to obtain the information. This information challenge could be due to several factors including privacy issues (via Health Insurance Portability and Accountability Act [HIPPA] law), outdated databases, limited time, or limited resources (financial or human). Some information could also require special authorization, making it difficult to obtain. For example, due to human rights and the study protocols, certain approval processes must be conducted (e.g., Institutional Review Boards [IRBs]). Due to this process, information, once obtained, may be outdated and no longer relevant at the time of the study. In addition, published federal, state, and county level information are approximately 2 or more years old. This fact, coupled with the length of time it takes to submit and publish articles/reports/manuscripts, may pose a challenge in acquiring timely information (Frankfort-Nachmias & Nachmias, 2008).

Definitions

Parents' knowledge/understanding of CPS marketing strategies: Parents' awareness, knowledge, and understanding of the CPS marketing/advertising strategies used to promote CPS in the state of Georgia. In addition, it included the awareness, knowledge, and understanding of several marketing techniques and avenues (via public service announcements-PSAs), such as billboards; educational materials generated, distributed, and used; mass media outlets (television, radio, and newspapers/magazines); print (brochures and handouts); and social media (via the Internet, computers, cell phones, and other personal electronic devices).

Parents' knowledge/understanding of CPS laws and regulations: Parents' awareness, knowledge, and understanding of the various policy and enforcement strategies, such as current Georgia state laws pertaining to CPS (eg., children ages 17 years and under must be restrained in a vehicle regardless of seating position; children under the age of 8 years and less than 57" tall in all seating positions [preferably in the rear seating position when available]) must be properly restrained in a CPSS appropriate for the child's weight and height and in accordance to the CPSS manufacturer's instructions; and children ages 5-8 years must be restrained at all times with either a seat belt or a booster seat.

Parents' knowledge/understanding of proper CPSS installation techniques: The use of the correct child restraint device in regard to a child's age, weight, and height. In addition, the following precautions were maintained: (a) the child must be in the correct type of seat based on age and weight requirements (infants-under the age of 1 year: infant-only/rear facing convertible; toddlers-1-4 years of age: forward facing convertible/high back belt positioning booster with 5-point harness; young children-5-8 years of age: belt positioning booster); (b) the child must be seated at the proper angle (rear facing infants: 45 degrees; forward facing toddlers and young children: 90 degrees-upright); and (c) the child must be securely fastened to the child safety seat (not more than 1 finger pinch between the child and the harness strap) and the child safety seat must be securely fastened to the vehicle seat (not able to move more than 1" to the left or right). Additional precautions included the child safety seat must be in the back seat of

the vehicle away from any active airbags; the child safety seat must be in the correct seating position: rear-facing (infant only seat or convertible seat)- infant; forward-facing (convertible seat or booster seat)- toddler or young child; the harness clip must be at the child's armpit level; and the seat belt must be threaded through the correct belt path (rear facing: below the child's buttocks; forward facing: behind the child's back).

Parental demographics: The gender, SES, education level, and ethnicity of the parent(s). However, it should be noted that these variables were attempted to be controlled.

Parents' use of CPSS: The use of the CPSS within the vehicle. The criterion dependent variable was CPSS use (and usage rates). The operational definition included CPSS usage rates (referred to as the overall documented usage rates for CPSS for children under the age of 8 in Fulton County, Georgia). In addition, it included the *National Occupant Protection Survey (NOPUS)* and *Safe Kids Child Passenger Safety Check List.*

NOPUS: The probability-based observational survey of CPSS use within the United States. In addition, the following precautions were maintained: (a) collected data at randomly selected intersections (provided probabilistic means) between 8 am to 6 pm. for nonmoving vehicles (stopped at traffic lights and/or stop signs); (b) gathered information on various items including drivers, passengers (front and two rear seating positions), and children (age 0- 12 months, ages 1-3 years, and ages 4-7 years); (c) involved nonparticipant observations and did not include interviews with drivers or

passengers; and (d) provided information through nation-wide observations performed on CPSS use (Glassbrenner, 2005).

Safe Kids Child Passenger Safety Check List: The primary and reliable source/instrument for CPSS checkup events and inspection stations. It included child information (age, weight/height, if the child was present at the time of the check event, and where was the location of the child in the vehicle); CPSS information at the event (type of seat, manufacturer's name and model number, was the seat near an airbag, was the CPSS facing the correction direction, was the harness strap correct, was the seat belt locking the CPSS tightly in place, was the lower anchors used, was the CPSS tethered correctly, was all of the federal standards labels present, and was the CPSS recalled); and CPSS installation information (was the old CPSS replaced at the CPSS check-up event, CPSS manufacturer's name and model number, and CPSS type). It also included CPSS related information (make/model, how it arrived in vehicle-based on installation and use, seat type appropriateness for child, and misuse observed); participant(s)' demographics (parent and child name, place of residence, contact information, and vehicle model/make information); and reference and resource sections (Safe Kids Georgia, 2014; Safe Kids Worldwide, 2014b).

Assumptions

Several assumptions were made throughout this study:

- All parents had access to CPSS,
- All parents had access to CPSS education/information materials,

- All administrators/checkers knew the current Georgia CPSS and occupant protection laws
- The current data obtain from CPSS surveillance systems (used to track and analyze CPSS usage rates) were accurate and up to date.

Scope and Delimitations

The scope of this cross-sectional, quantitative study was to examine the relationship between the CPSS usage rates and the variables of parents' knowledge of CPSS compliance and CPS marketing techniques for parents located within Fulton County, Georgia. I analyzed whether this relationship differs according to the use of a variety of marketing strategies including public service announcements, billboard advertisements, mass media marketing outlets (television, radio, and Internet) and educational materials generated, distributed, and used. I used a convenience sample of Fulton County, Georgia parents involved in CPSS check events within a 3-month time period. There were generalization and sampling limitations due to the cross-sectional design of the study, the number of study participants (geared only towards parents within Fulton County, Georgia), and the use of a convenience sample (Simon, 2011).

The perceived delimitations associated with this research included internal validity (study design, testing, and selection bias). A cross sectional study design was used. The population and data sample were obtained from information gathered within a 3-month time period. This time period may not be sufficient enough to predict a true correlation between the indicated variables. In addition, testing dilemmas occurred.

Certain testing concerns such as the (a) administrator of the instrument, (b) administration of the instrument, (c) instrumentation itself, (d) time the instrument was administered and/or data were obtained, and (e) the location where the instrument was administered and/or data were obtained could have produced skewed or inaccurate results. Selection bias may have also occured (Simon, 2011).

Limitations

The limitations of the study included external validity issues from generalization of results. Because a convenience sample was used, a true data representation of the county/state was difficult to obtain and the number of participants did not produce statistically the final results to the entire population, causing both internal and external validity concerns (Simon, 2011).

Other limitations could also have been present, such as biases (selection of participants and reporting of results) and incorrect or nonreporting of information or results (eg., child's demographics, vehicle's information, usage of CPSS and occupant restraint systems (Huniqian, Jingzhen, Xiangxiang, Xiaojunm, & Liping, 2016; Xiangxiang, Jingzhen, Fuyuan, & Liping, 2016). In addition, limited or lack of cultural competence; a lack of follow up; as well as the unavailability to explore long-term study evaluation (possibly due to limited resources-time, finances, and people) may have led to not capturing the full essence of the population and the situation at hand (McKenzie, Fowler, Roberts, & Kaercher, 2016; Staunton et al., 2005).

Significance of the Study

I attempted to assist in the promotion of social change and the reduction of child-related motor vehicle injuries and deaths within Fulton County, Georgia. To promote positive social change and develop a successful health promotion initiative, certain factors were considered. These factors included a needs assessment of the audience; the promotion of behavior change efforts; the recognition of various economic, political, environmental, and social factors; and the active involvement/engagement of the community (Freudenburg, 1982; National Institutes of Health, 2015). Social change endeavors should encompass legal and ethical considerations. In addition, social change should provide opportunities for the reflection of how the social endeavors will influence the daily functions of the impacted population (Freudenburg, 1982; National Institutes of Health, 2015).

I attempted to enhance social change pertaining to child-based, traffic-related incidences. Within the past 2 decades, child passenger injuries and deaths have been on the rise. One of the main reasons for this influx in tragedies is primarily due to the high levels of nonuse or misuse of child safety seats (Keay et al., 2012). However, few studies have been conducted on the correlation between parents' knowledge of CPSS issues and CPSS usage rates (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a).

Social change was attempted through the production of pertinent information geared towards (a) effective marketing and advertising strategies regarding CPSS use, (b) the proper enforcement of CPSS-related laws, (c) standardization of CPSS legislation,

and (d) adequate occupant protection surveillance systems (Fulton County Georgia Government, 2011; Georgia Governor's Office of Highway Safety, 2014e). With this information, public health practitioners, educators, and researchers should be able to address motor vehicle-related injury prevention concerns while planning, designing, implementing, and evaluating successful child occupant injury prevention initiatives. In addition, I attempted to provide pertinent information to policy makers that would stress the need for more standardized regulations and stricter enforcement of the laws and also provide more information to parents on how to become knowledgeable of child occupant issues, therefore altering present misconceptions of CPSS compliance.

Summary

In this chapter, I outlined on a variety of CPSS concerns including a (a) brief background of the study at hand including a problem statement, the purpose of the study, and the indicated research questions; (b) the theoretical framework; (c) nature of the study; (d) operational definitions; (e) assumptions, scope, delimitations, and limitations of the study; and (f) significance of the study. I also provided a brief overview of the rationale and necessity for additional/further research pertaining to CPSS compliance issues. The upcoming chapter provides literature on CPS (including literature search strategies as well as theoretical relevance). In addition, I supply a literature review of significant research, data, approaches, and systems.

Chapter 2: Literature Review

Introduction

In Chapter 2 of this dissertation, I examine national and local background literature associate with CPS issues including the significance, data, previous research, and factors contributing to child-related motor vehicle injuries and deaths. In addition, I provide information on the theoretical foundation and framework; related occupational studies; national and local impacts; and various protection factions such as occupant protection surveillance systems, asset mapping, the multidisciplinary approach, and social systems.

Traffic-related injuries and deaths remain one of the top concerns amongst the motor vehicle world (Drive Safely, 2015). Nationally, the leading cause of death and injury to children (between the ages of 2-14) relates directly to motor vehicle crashes (Drive Safely, 2015). In 2009, there were more than 1,300 child occupant (14-years-old and younger) fatalities and roughly 179,000 child-related traffic injuries (Drive Safely, 2015). Annually, over 618,000 children (12-years-old and younger) travel in a motor vehicle without the appropriate restraint (Drive Safely, 2015).

The nation's trends of motor vehicle crashes tend to also mimic the statistical traffic rates in the state of Georgia fatality (New Georgia Encyclopedia, 2014). In 2011, there were approximately 877 motor vehicle-related deaths, of which 29% occurred in the metropolitan Atlanta vicinity (author, year). In addition, every year in Georgia, approximately 40 children (ages 5-12) are involved in a motor vehicle-related fatality

(Fulton County Georgia Government, 2011). The National Highway Traffic Safety Administration (NHTSA, 2003) displayed that within a 9-year interval (1994-2003), 307 of Georgia's children were fatally injured.

In this chapter, I will supply information on the (a) background and significance, (b) historical context, (c) marketing/advertising strategies, (d) occupant protection surveillance systems, (e) social systems, and (f) a brief summary/discussion concluding the highlights of the study.

Literature Search Strategy

Throughout the dissertation process, several resources and databases were used to conduct the literature review. These resources included MEDLINE and MEDLINE Complete, CINAHL and CINAHL Complete, PubMed**,** EBSCOhost**,** Science Direct, Web of Science, Health and Medical Complete, American Health Line, Demographics Now, Sage and Oxford Journals, and Nursing and Allied Health Source. In addition, search engines were used such as Google Scholar; ProQuest (dissertation and thesis database); as well as websites from various government (federal, state, local), education, and related programmatic/topic-based arenas.

Articles and resources were also identified by using scholarly databases as well as the Walden University and the Centers for Disease Control and Prevention. I focused primarily on children between the ages of 0-14 years; parental and/or guardian education and knowledge; the use (or nonuse of CPSS); standardization (or non-standardization) of CPSS laws; CPSS issues and laws in Georgia; and CPSS studies, programs, and

interventions. I searched websites that ended with “edu” or “gov” as well as conducting advance searches (on the indicated site-via the previous mentioned methods) and reviewing postings from other authors or references. The information gathered was derived from several formats including research papers; evaluation articles; case studies; literature/theoretical reviews; national, state, and local data; and mortality/morbidity, crash, and other assorted surveillance databases. I used key words such as *child passenger safety, child passenger safety laws, occupant protection, occupant protection laws, safety belts, car seats, Georgia injuries and fatalities, Georgia occupant protection data, Georgia restraint laws, child passenger safety programs and studies*, and *pedestrian fatalities and deaths*. The topic was then narrowed down or specified as much as possible (to child passenger safety in Georgia).

Theoretical Foundation

The Use of Theory in Research

Two distinctive facets are used throughout research. These facets include qualitative and quantitative study designs. Qualitative designs evaluate the progressive actions of social tendencies and seek to find a greater understanding regarding a particular phenomenon in order to justify its existence. Quantitative designs are mathematical depictions of a study. Quantitative methods could be best categorized as either surveys or experiments (Creswell, 2003; Simply Psychology, 2008). Quantitative research involves the experimentation and evaluation of hypotheses via deductive reasoning. In deductive reasoning, scholars emphasize the movement of thought from a

general assumption to a more exact inference (via surveillance and examination; Babbie, 2004).

In both methods, scholars use theory to justify why and how the phenomenon occurs. The use of these theories assist with research and practice by providing a rationale to why certain health behaviors are not followed or adhered to, what strategies should be implemented to help promote healthy behavior, what are the needs of the individual population groups, and how to apply the suggested strategies and techniques (especially for long-term maintenance and sustainability; Glanz, Rimer, & Viswanath, 2008).

Bartholomew (2001) stated, "A theoretical method is a general technique or process for influencing changes in the determinants of behaviors and environmental conditions" (p. 171). To translate methods into strategies, several steps must be achieved. Step 1: Methods should be identified and placed either through the grouping of learning and changed objectives (guided by determinants) or through the grouping of methods and strategies (author, year). Step 2: Methods should be translated in practical strategies (author, year). In Step 3, methods and strategies should be organized by grouping learning objectives at each ecological level, while at the same time maintaining proper operational functions (Bartholomew, 2001). The use of theory is important in research and practice because it can assist with the development and implementation of public health campaigns and research. Glanz et al. (2008) stated, "Program planners can use theories to shape the pursuit of answers to Why? What? How?" (p. 27). These questions

could provide a rationale to why certain health behaviors are not followed or adhered to, what strategies should be implemented to help promote healthy behavior, as well as determining the needs of the individual population groups and how to apply the suggested strategies and techniques (especially for long-term maintenance and sustainability; Glanz, et al., 2008).

Health promotion theories are used as instruments that "can help the understanding of diverse populations and the nature of health behaviors. They can also explain the dynamics of the behavior, the process for changing behavior, and the effects of the external influences on the behavior" (Huff & Kline, 1999, p. 68). Health promotion theories "can help the understanding of diverse populations and the nature of health behaviors. They explain the dynamics of the behavior, the process for changing behavior, and the effects of the external influences on the behavior" (Huff & Kline, 1999, p. 68). Behavior change theories provide a way for public health practitioners to motivate, educate, and engage the audience/program participants while endorsing behavior modification strategies. There are many behavior change theories, and sometimes the use of a single theory may not effectively lead to the implementation of the program. Program planners may have to use a combination of theories to capture the essence of the program (as well as to achieve the desired outcomes; Bartholomew, 2001; Frost et al., 2008).

Scholars use theories to explore behavioral concepts and potential behavior change. The theories could further be divided into various facets depending on the health

need. Explanatory theorists look at the overall existence and rationale of a public health problem or concern (inspecting the norms, attitudes, beliefs, resources/support, and efficacies) (Glanz et al., 2008). Change theorists examine and assist with the implementation and construction of a public health initiatives (Glanz et al., 2008). Change theories can be used to frame program evaluation efforts. Implementation theories are a subset of change theories (Glanz et al., 2008). However, these theories also take into consideration a problem, concern, or population group. In addition, theories could be broken down into concepts, constructs, and variables. These elements aid to frame the major and overall theme of the theory, especially as it relates to project research, program implementation and practice, and intended behavior change (Glanz et al., 2008).

Community health education theory entails the use of theory and evidence-based research to formulate the basis of health education efforts within the community ecological level. It includes the involvement of theoretical methods throughout the community level (as opposed to the individual and interpersonal levels). Community-based theories include the community organization model, the ecological approaches, the organizational change theory, and the DOI Theory. They also could include the use of the stage theory, interorganizational relations theory, social marketing theory, and the community coalition action theory (Glanz et al., 2008; Riverside Community Health Foundation, n.d.).

Because the primary audience is the community, these theories should take into consideration the focus and needs of the community. In addition, the theories should promote the engagement and participation of the community members; foster intersectional collaboration; and endorse community competency, capacity/resources, and sustainability (Nilsen, 2006). Applying community health education theories may contribute to the reduction in morbidity and mortality rates because community health education theories focus on health education and promotion aspects (via the public health arena and evidence-based research). These theories entail promoting community-based efforts with the hopes of reducing disease burden (eg., mortality and morbidity rates). They use theoretical frameworks to lay the foundation of public health initiatives, while at focusing on the needs of the community; investigating health beliefs, norms, behaviors, and changes on the community; and engaging and actively involving the community (Glanz et al., 2008; Nilsen, 2006).

Due to the adoption of these concepts, public health disease burden and illnesses could continue to decline. By focusing on the community level as well as using evidence-based theoretical frameworks, public health initiatives could impact the overall reduction of morbidity and mortality rates. Not only could these theories assist with the establishment of public health programs (providing the foundation, justification, and rational for their existence), but they also could aid in the employment of various research design methods, initiatives and services, and public health policies.

When using theories, scholar should determine if it is best for the theory to be formulated before or after the research. The theory-then-research strategy is used to identify or construct theories at the onset of the research and use them to justify or refute hypothesis, concepts, and/or ideas (via empirical research). This strategy involves five primary steps: developing a theory/model, identifying a proposition/hypothesis that was generated from the theory/model, constructing a research plan to test the proposition/hypothesis, determining if the proposition/hypothesis was justified or refuted (and making necessary changes to the theory if needed), and using or improving the theory (via another alternative propositions/hypothesis; Frankfort-Nachmias & Nachmias, 2008). The research-then-theory strategy involves four primary steps: analyzing an issue (as well as all of its contributing factors), measuring the factors in various situations and settings, evaluating the acquired results for variation patterns, and developing a theory based on the variation patters observed (Frankfort-Nachmias & Nachmias, 2008).

Theoretical Framework

Theories used in health promotion aid with understanding various population groups as well as the related health issues, health behaviors, and external factors that affect them (Huff & Kline, 1999; Nelson & Moffit, 1988). Theories also assist with developing behavior change guidelines. Nelson and Moffit (1998) explained the importance of including theoretical frameworks/models when researching seat belt usage and designing public health initiatives geared towards increasing seat belt usage rates. Nelson and Moffit analyzed the use of six social and behavioral science theories (theory

of reasoned action, the health belief model, fear arousal, operant learning, social learning theory, and diffusion of innovations). Nelson and Moffit stressed the need for continued use in future research studies. In regard to this dissertation, the DOI theory and the social marketing theory were used.

Diffusion of Innovation Theory. The use of the DOI theory is good for reaching a variety of population groups on various health concerns (especially in regard to children and health education). Scholars have found that child-based initiatives should begin in early childhood and possess longevity (placing focus on each childhood phase-developmentally, physically, and socially) (Frost et al., 2008;). The DOI theory could be used to understand the progression of various heath behaviors and initiatives (including child-based programs; Frost et al., 2008; Mailbach, 1995).

The concept of diffusion has been defined as the movement from understanding to acceptance and finally to application and preservation of a concern. Diffusion has been classified as the transition from knowledge/awareness to adoption and finally to implementation and maintenance/sustainability of an issue (Bartholomew, 2001). The theory includes the participant's process of decision making (awareness, influence, choice, and validation) via various communication mediums. Awareness is the participant's understanding of the issue (Bartholomew, 2001). Influence entails the participant's attitudes regarding the issue and behavior change (Bartholomew, 2001). Choice is the participant's readiness to accept/reject the issue and behavior change (Bartholomew, 2001). Validation is the participant's preservation of the issue and

behavior change (Bartholomew, 2001). Rates of behavior modification may vary depending on the participants' willingness/desire to change, formed opinions, change agents, and change aides. This theory also examines the acceptance, evolution, and dissemination of health initiatives (as oppose to health behaviors) (Bartholomew, 2001; Frost et al., 2008; Mailbach, 1995).

The DOI Theory could be a great tool for reaching audiences on a variety of health topics and concerns. The mere premise of the DOI represents a productive and appropriate strategy for health education and prevention amongst children. Mailbach (1995) referenced that theory in order to acquire positive results, child-centered projects should be detailed oriented, possess signs of longevity and sustainability, and commence within the early stages of life. In addition, programs should concentrate on all phases of a child's life (age as well as their physical and social environments). The theory has the capability to not only explain occurrences for the movement and transition of specific health behaviors but also contains explanations for the adoption, evolvement, and disperse of certain health education/promotion initiatives (Bartholomew, 2001; Frost et al., 2008; Mailbach, 1995).

As previously stated, the Nelson and Moffit (1998) study discussed the necessity to include theoretical frameworks/models when researching seat belt usage and designing public health initiatives. It also focused on the steps involved in the innovation decision making process (knowledge, persuasion, decision, and confirmation). Knowledge entails the audience's comprehension of the topic. Persuasion includes the audience's beliefs and

feelings towards the topic (as well as possible change). Decision contains the audience's willingness to receive/refuse the topic/change. Confirmation includes the support and maintenance of the change (Nelson and Moffit, 1998). In regard to safety belt use, the article also examined how the DOI theory could be utilized to solicit individuals to participate in behavior change through the promotion of safety benefits and knowledge. This diffusion of theory could be performed via enhancing parents' knowledge of safety seats (including the differences in types and placement of seats), the use of the seats, the benefits of the utilization of safety restraints, the alignment of personal safety values and beliefs, the ease of maintaining seat use, and the low cost associated with safety seat use and promotion (Nelson and Moffit, 1998).

As previously stated, in regard to the final project, the DOI was applicable to the following variables within the study: *parent's knowledge/understanding of proper installation techniques, parent's knowledge/understanding of child passenger safety marketing strategies, parent's knowledge/understanding of CPSS laws and regulations (policy and enforcement strategies), CPSS laws and regulations (policy and enforcement strategies), as well as parents' restraint use*.

The DOI Theory was used to show if there existed gaps between CPSS parental education and practice and CPSS enforcement; and if so, how these factors were related to CPSS use. It also attempted to show if through proper and early education on CPSS issues, parents were more informed and possessed a higher probability of understanding CPSS concerns, ultimately leading to increase CPSS usage rates. In addition, the theory

attempted to petition parents (and children) to partake in behavior change methods via the endorsement of CPSS safety benefits. Behavior change was attempted by enriching CPSS knowledge and use, promoting CPSS benefits, aligning and endorsing personal safety ethics and principles, and stressing the simplicity of CPSS use and low cost.

Social Marketing Theory. The Social marketing theory utilizes marketing and advertising philosophies to sell affirmative health behaviors. The theory integrates marketing strategies with socio-psychological theories to construct behavior change programs. Social marketing theory also involves the utilization of local entities and interpersonal systems as essential facets in the behavior change cycle. The social marketing theory attempts to link the mental, social, financial, and practical factors (for the individual as well as their perspective behaviors) (Wallack, Dorfman, Jernigan, & Themba-Nixon, 1993). In addition, social marketing is used a communication technique which attempts to modify understanding, viewpoints, and behaviors in relation to social causes. The theory is utilized to distribute and encourage positive health change (Allen-Greil, 2015).

The social marketing theory employs the social system network. The social system approach is a good tool when focusing on large audiences and could be modified to fit various health concerns. This could serve as a valued asset when focusing on parents (and children) (Svenkerud & Singhal, 1998). The theory is utilized to promote the principles of marketing in order to enhance behavior. The theory is described as the "the design, implementation, and control of programs seeking to increase the acceptability of a

social idea or practice in a target group" (Diehr et al., 2011, p.125). The theory elaborates on the idea that individuals would adopt change if they consider the change beneficial. The theory utilizes the P principles of marketing: product, price, promotion, place, policy, and public (new). The product is the actual idea or that is being endorsed. The price is the attempt and recognition of the product or behavior. Promotion includes the advertising of the product or behavior. The place is the ease or opportunity of acquiring the product or behavior. Policy is the rules and guidelines associated with health outcomes. The newly incorporated public includes the intended audience and partnerships (collaborators) who are affected by the initiative. In addition, the concept of social marketing entails the awareness of the intended audience's needs and requests. Social marketing recognizes that the intended audience would compensate a price for a positive outcome (Centers for Disease Control and Prevention, 2011b; National Institutes of Health, 2013; US Department of Health and Human Services, 2014; Wallack et al., 1993).

The utilization of social marketing coupled with child passenger safety efforts could be displayed in several studies (Biagioli, 2004; Bryant-Stephens et al., 2013). One such study was conducted in 2013 (Bryant-Stephens et al., 2013). The goal of the study was to analyze the success of a community health initiative that focused on increasing the usage rates of belt-positioning booster seats (BPBS) via the utilization of social marketing strategies. The study was conducted in Pennsylvania for a 1-month time period and consisted of parent/caregiver education and BPBS dissemination. Throughout the

study, “800 vehicles with 822 children aged 4 to 7 years were observed for BPBS use” (Bryant-Stephens et al., 2013, para 1). The study contained both an experimental and non-experimental group and was evaluated immediately following the conclusion of the program as well as six-months following the conclusion of the program. Results determined that there was between a 39% to 50% increase in BPBS prevalence rates when controlling for various determining factors (child’s age and gender, vehicle type, driver gender, and driver level) (Bryant-Stephens et al., 2013). This study validated the notion that through proper community collaboration and health education initiatives, social marketing strategies could be an effective means to promote BPBS use in various communities.

Another study (conducted in Oregon, 2004) confirmed the need to utilize effective social marketing campaigns to educate parents, caregivers, and health professionals. A program was devleoped that included the utilization of several social marketing strategies. In 1995, the Alliance for Community Traffic Safety in Oregon (ACTS Oregon) was established. ACTS is a non-profit organization whose goal is to assist in the reduction of child-related motor vehicle deaths and injuries in the state of Oregon. ACTS attempt to achieve its goal through certifying child passenger safety technicians as well as educating parents/caregivers and health professionals on CPSS issues and concerns. Educational methods include the utilization of social marketing strategies such as “television public service announcements, mailings, billboards, radio spots, and a web site” (Biagioli, 2004, p. 55). Results showed that although child-related motor vehicle

issues continue to be a health concern in Oregon, social marketing tactics has assisted in the reduction of child-related motor vehicle deaths and injuries. Social marketing strategies have proven to be effective and should continue to be implemented.

As previously stated, the social marketing theory is applicable to the following variables for the study: *parents' knowledge/understanding of child passenger safety marketing strategies, parents' knowledge/understanding of CPSS laws and regulations (policy and enforcement strategies), child passenger safety marketing strategies, as well as parents' restraint use.*

The social marketing theory was utilized within this research to portray if there existed a lack of proper CPSS marketing and enforcement strategies. Within the past recent years, there has been a push on motor vehicle safety throughout the state of Georgia. Unfortunately, these efforts did not adequately concentrate on all aspects of traffic safety. Most of the attention was placed on topics related to motorcycle safety and impaired and/or aggressive driving. In addition, the state of Georgia emphasized driving issues related to age specific groups (teenage drivers and older-age drivers) as well as general occupant protection campaigns (ex: Click It or Ticket). Little focus has been geared towards CPSS issues and concerns. Through the use of the social marketing theory, attempts were made to demonstrate that through proper marketing and advertising techniques as well as through the utilization of social systems, CPSS usage rates could possibly be altered and modified. This theory was previously been applied in the areas of

preventive health behavior and compliance with systems (Allen-Greil, 2015; Bryant-Stephens et al., 2013; Frost et al., 2008).

The theory attempted to utilize the P's principles of marketing. Product comprised of a CPSS education initiative geared to parents (and children) who reside in Fulton County, Georgia. Price entailed: (a) a decline in CPSS morbidity and mortality rates, (b) growth in CPSS awareness, (c) growth in trust among the planners and the community, and (d) growth in the aspiration to alter unsafe behaviors (non-and/or misuse for CPSS occupant systems). Place entailed (a) Fulton County, Georgia, (b) diverse number of community associations (for CPSS education seminars), and (c) diverse number of fire and police stations (for CPSS installation workshops). Promotion entailed a) a community safety campaign b) involvement and community evaluations, c) community capacity, d) linguistic and cultural appropriateness, and e) CPSS awareness and knowledge.

Literature Review

Accidents are one of the greatest threats of life to children (Grossman, 2000). More school age children die from preventable, unintentional injuries than from any other disease. More school age children die from preventable, unintentional injuries than from any other disease. "Unintentional injuries claim the lives of more children each year than any other cause of death" (Grossman, 2000, p. 23).

In Georgia and throughout the United States motor vehicle crashes remain a major health concern amongst the walking and driving populations. In 2005, it was researched

that 6,181,000 police reports were generated involving various types of traffic-related incidences (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a). Of that figure, approximately 2,788,000 occupants and/or pedestrians were injured (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a). For that same year, in the United States, a total of 42,6636 traffic fatalities occurred involving 1,946 (4%) child occupants (ages of 0-14 years) (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a). "All children under 15 years of age represented approximately 1,451 (4%) of all vehicle occupant fatalities, 234,000 (9%) of all people injured in motor vehicle crashes, and 203,000 (8%) of all vehicle occupants injured in crashes" (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a, p. 1).

In 2015, roughly 347,653 traffic incidences transpired (Georgia Governor's Office of Highway Safety, 2015). Of that figure, 139,056 people suffered from motor vehicle related injuries and 1,744 people experienced fatalities and death (an increase to 58%), including 31.5% of which were alcohol-induced (Georgia Governor's Office of Highway Safety, 2015). The metropolitan Atlanta area including Cherokee, Clayton, Cobb, Dekalb, Douglas, Fulton, Gwinnett, and Henry counties represented 26% of the total number of fatalities in the state (Georgia Governor's Office of Highway Safety, 2015). Fulton County held the highest number with 118 deaths (Georgia Governor's Office of Highway Safety, 2015). Every year in Georgia, approximately 40 children (ages 5-12 years) are involved in a motor vehicle related fatality (Georgia Governor's Office of Highway Safety, 2015). For a 10-year span, a total of 307 of Georgia's children in this

same age group were killed while riding in motor vehicles. Of that number, 105 (34.2%) were riding in the front seating position (Georgia Governor's Office of Highway Safety, 2015).

Another alarming concern for children not only living in Georgia, but also residing in the United States is pedestrian-related injuries and deaths (National Center for Statistics & Analysis-Traffic Safety Facts, 2005b). Nationally in 2003, pedestrian injuries and deaths accounted for more than 4,700 occurrences (National Center for Statistics & Analysis-Traffic Safety Facts, 2005b). Almost all of these incidences involved traffic-related circumstances. "On the average, a pedestrian is killed in a traffic crash every 108 minutes and injured every 8 minutes" (National Center for Statistics & Analysis-Traffic Safety Facts, 2005b, p. 1). Of these startling figures, 18% represented children between 5-9 years of age who were fatally injured (National Center for Statistics & Analysis-Traffic Safety Facts, 2005b). In addition, 43% of all childhood pedestrian deaths (under 16 years old) occurred after school between the hours of 3:00pm and 7:00pm. (National Center for Statistics & Analysis-Traffic Safety Facts, 2005b).

Almost half of all childhood pedestrian incidences transpired on the weekend (Friday- Sunday), which could be due to the large amount of students who are at home, left to play unsupervised and unattended (National Center for Statistics & Analysis-Traffic Safety Facts, 2005b). In addition, 60% of the pedestrian deaths included males (doubled that of females- possibly due to the high levels of risk taking and feelings of invisibility), 74% occurred in non-rural, high traffic areas, 80% at mid-block, non-

crosswalk designations, and 67% during nighttime hours (National Center for Statistics & Analysis-Traffic Safety Facts, 2005b).

An estimate that 1 out of 10 pedestrians killed in Georgia were between 1-16 years of age (Georgia Governor's Office of Highway Safety, 2015). On average, there are 13 fatalities for children ages 0-16 years representing roughly 9% of the total fatalities (Georgia Governor's Office of Highway Safety, 2015). Approximately eight fatalities occurred for children under 16 years of age annually (Georgia Governor's Office of Highway Safety, 2015).

Motor vehicle crashes followed by pedestrian injuries and deaths remain to be the top two leading causes of unintentional injuries to children 14 years old and under (Weatherwax et al., 2015; Zonfrillo et al., 2015). Several factors (demographics, individual behavior, and social issues) are associated with these two public health issues. Motor vehicle deaths and pedestrian injuries are highest in children ages 0-14 years (Weatherwax et al., 2015; Zonfrillo et al., 2015). Toddlers (between 1-2 years old) "sustain the highest number of pedestrian injuries primarily due to their small size and limited traffic experience. Children living in areas that have a high population density of children, urban setting or environment, household crowding, high housing density, low socioeconomic status, poor supervision, and no safe play environments are more likely to suffer pedestrian injury" (Grossman, 2000, n.d.).

External individual behaviors also account for both motor vehicle/pedestrian deaths and injuries caused to children (National Safe Kids Campaign, 2014). In recent

years, nearly a quarter of the child-related traffic deaths have been linked to alcohol or other forms of substance abuse, of which almost 50% of the children involved were automobile passengers (Safe Kids Worldwide, 2015). This factor is coupled with the high percentage of car seat misusage among parents. Although 96% of parents believe their CPSS has been installed properly, it has been shown that an average of 82% of parents has some type of child safety restraint misuse (Safe Kids Worldwide, 2015). Nearly a third of children ride in the wrong restraint for their age and size (Safe Kids Worldwide, 2015). In addition, the utilization of safety belts by drivers has been linked positively with the use of child restraint systems in automobiles (Safe Kids Worldwide, 2014b). In recent studies, nearly 40% of drivers who were not wearing seat belts were driving children who were completely unrestrained (representing the greatest risk factor) (Safe Kids Worldwide, 2014b). It has been found that 14% of children who are 14 years old and younger ride without proper restraint use (National Safe Kids Campaign, 2014). This fact places these unrestrained children at risk for occupational injuries. In addition, children have a greater chance of suffering from a motor vehicle injury when drivers do not yield to pedestrians as well as stop signs. Stop sign infractions have been linked with around 19,000 crashes annually (of which 200 are fatal) (National Safe Kids Campaign, 2014).

Children are more vulnerable to injuries due to the fact that their motor and cognitive abilities are in the developmental stages of growth and development (National Safe Kids Campaign, 2014). Children are at greater risk than adults of motor vehicle and

pedestrian injuries because they are unable to properly assess the risk involved in these activities, they have less coordination, slower reaction times and less motor accuracy (National Safe Kids Campaign, 2014).

Injuries caused to the head and skull has proven to be one of the top sources for child disability and death (Centers for Disease Control & Prevention, 2015). Head injuries account for a high portion of motor vehicle fatalities caused to children and is considered one of the most important determinants in child-related traffic incidents (Centers for Disease Control & Prevention, 2015). Children under the age of ten are at greater risk for serious head injuries than older riders (Centers for Disease Control & Prevention, 2015). This greater risk of injury could be due to their lack of experience coupled with their slow reaction time to unsafe conditions (Centers for Disease Control & Prevention, 2015).

Related Studies of Significance

Several studies have been conducted to justify the importance of this topic as well as the need for further/additional research and educational initiatives (Agran, Anderson, & Winn, 2004; Emery, Hawkes, Cassabaum, & Rapstine, 2010; Muller et al., 2014). Studies have shown that proper utilization of child passenger safety restraints reduces the probability of child-related motor vehicle injuries and death. In 2009, over half of the motor vehicle fatalities involved unrestrained children (Hawkes, Cassabaum, & Rapstine, 2010). Research has also shown that with proper safety education, car seat usage rates

would increase, therefore ultimately reducing the incidence rate of child-related motor vehicle injuries and deaths (Muller et al., 2014).

In 2014, Muller et al. conducted a study over a 10-month period in regard to weekly 2-hour car seat education classes. The classes were conducted by certified child passenger safety technicians (CPST) in both English and Spanish. The classes consisted of information pertaining to child passenger safety laws/regulations, a 21-minute safety education video, class discussions on the previously viewed video and CPSS installation issues/concerns, as well as the dissemination and completion of a pre-test and post-test (Muller et al., 2014). Pre-test and post-test data were collected and a paired t-test was conducted. Results showed that post-test marks were more than three points higher than the previous pre-test. In addition, mean data rates for English-speaking participants were higher than their Spanish-speaking counterparts (Muller et al., 2014).

The study demonstrated that through proper multi-factorial education (curriculum, Power-point presentations, videos, discussions, hand-outs, and hands-on interactive demonstration/installations) parents/caregivers could increase their knowledge regarding CPSS issues. This increase in knowledge could ultimately lead to increase in CPSS usage, leading to a decrease in child-related motor vehicle injuries and death (Muller et al., 2014). The article supplied the necessary foundation for the intended investigation through its recognition of the current research gaps and the need for a multi-faceted education program. Findings from the study continued to demonstrate that as the access and desire for education increases, knowledge increases (Muller et al., 2014).

In addition, Agran et al. (2004) investigated the partial or complete lack of CPSS use in California. It was found that Hispanics and women were the primary violators as well as those with annual incomes of less than $30,000. In addition, it was found that "factors influencing CSS nonuse were: 1) lifestyle factors, 2) transportation and trip circumstances, 3) nonparent or no driver issues, 4) parenting style, 5) child's behavior, and 6) perceived risks of nonuse" (Agran et al., 2004, para 1). The article also provided justification for the need of clear, understandable CPSS education materials. This is especially true for those who utilize English as a second language. It stressed the importance for researching parenting skills as well as law enforcement as they pertain to CPSS issue (Agran et al., 2004).

Emery et al. (2010) portrayed that successful, adequate CPSS initiatives could be achieved (with adequate CPSS education methods with not only adults/parents but also young children). This article showed that adequate educational programs could ultimately lead to an increase of CPSS usage rates (and possibly a decrease in the incidence of CPSS injuries and deaths). The Kidd and McCartt (2013) study also found a correlation between seat belt use and CPSS usage rates. This article provided a justification for the need of continuous education on occupant and CPSS related issues (Emery et al., 2010).

In 2009, Brixey and Guse displayed that despite the availability of CPSS information, both physicians and caregivers are misguided of the seriousness of the issue. The study showed that additional work must be conducted to provide physicians with the necessary information about CPSS for their personal knowledge as well as to disseminate

to their patients. The study also showed that caregivers, if provided the opportunity, would like to increase their knowledge regarding CPSS issues. O'Neil, Rouse, Hackworth, Howard, and Daniels (2012) portrayed the need for trauma nurses to gain and maintain updated knowledge in CPSS issues. This is important, not only to increase individual knowledge, but also relate acquired information to parents and caregivers (ultimately decreasing the incidence of CPSS misuse rates (Brixey & Guse, 2009; O'Neil et al., 2012).

Zonfrillo, Sauber-Schatz, Hoffman, & Durbin (2014) provided pertinent information on the rationale and potential reasons on how CPSS information is being distributed in health care facilities. The article also supplied a justification that additional CPSS education and re-enforcement must be conducted (in primary care settings). This study also assisted in increasing the overall knowledge rate of CPSS issues and concerns. Ryan and Rigby (2007) presented the need for further research for a topic that is less recognized. Transporting children with special needs is a very important topic that sometimes goes astray. This topic is a very essential piece to CPS issue (especially transporting wheelchair users) and must researched and addressed further (in greater detail) (Ryan & Rigby, 2007; Zonfrillo et al., 2014).

Russell, Voas, Dejong, and Chaloupka (1995) supplied the necessary information pertaining to its specific media advocacy campaign and public policy change/modification. The extensive write-up on questionnaire and assigned grade formation provided the reader with sufficient information on duplication. In addition, the

authors supplied a comprehensive replication plan and provided suggestions and recommendations. This study demonstrated that media advocacy does in fact play a major role in public policy. Staunton et al. (2005) presented the fact that child passenger safety is a major public health problem (both nationally and locally) and supplied information of possible gaps in research, as well as potential solutions (Russell et al., 1995; Staunton et al., 2005).

Keay et al. (2012) studied the evaluation strategies for a cross-sectional CPSS (CPSS) program in Sydney Australia. The program conducted a cluster-randomized trail which included 27 daycare centers throughout Sydney Australia (involving children three to five years of age). The program aimed to disseminate a comprehensive approach to CPSS education which included educational workshops, CPSS distribution, and CPSS installation stations. The goal of these programs was to assist in the reduction of child-related traffic injuries and deaths as well as increase the presence of CPSS legislation (geared towards the enforcement of age-appropriate proper CPSS installation and utilization) (Keay et al., 2012). Data collection included information obtained via direct observation and self-administered surveys. After program implementation, follow-up, and evaluation (via SAS 9.1 and Stata 11 statistical software as well as Fisher's exact test), it was found that an increase number of children were riding in age-appropriate CPSS as well as a decrease number of CPSS installation errors. "The program increased use of age-appropriate restraints and correct use of restraints, which translates to improve crash injury protection" (Keay et al., 2012, para 4). The information obtained in this

study justifies the need for not only CPSS education efforts, but also the need for standardization and enforcement of CPSS related laws, guidelines, and regulations. The study helps to build on the need (and value) for multifaceted community-based initiatives that are culturally represented.

Nationally

Child safety laws and regulations throughout the United States were developed to reduce injuries and prevent childhood deaths (Advocates for Highway and Auto Safety, 2013). The state of Tennessee passed the first child occupant protection law in 1978. Since that time, all states within the nation have passed some sort of child occupant protection law (Advocates for Highway and Auto Safety, 2013). Unfortunately, these laws do not provide strong enough restrictions and guidelines toward occupant safety. Within the past two decades, child passenger injuries and deaths have been on the rise. One of the main reasons for this influx in tragedies is primarily due to the high levels of nonuse coupled with misuse of child safety seats (Advocates for Highway and Auto Safety, 2013). The evidence supporting this issue is focused towards several key and distinctive factors: inadequate nonstandard state laws and lack of strong child safety policy enforcement (Advocates for Highway and Auto Safety, 2013). Many of the individual state laws and regulations have gaps in coverage pertaining to age, seating position, specific child safety seat use, and insufficient penalties. Due to this fact, many parents and caregivers either choose not to restrain their little ones or restrain them incorrectly and inappropriately (Advocates for Highway and Auto Safety, 2013). Parents

tend to look at the laws and policies (national, state, and local) for guidance and support. Without the proper laws in place, parents have been, and will continue to be misinformed about child passenger safety (Advocates for Highway and Auto Safety, 2013).

State laws provide the legal basis for the transportation of children in motor vehicles. Currently there exist several federal laws that focus on child occupant protection, including Federal Motor Vehicle Standard (FMVSS) 208, FMVSS 213, and FMVSS 225 (Advocates for Highway and Auto Safety, 2013). FMVSS 208 states that seat belts are required in all seating positions. In addition, lap/shoulder belts are required for all outboard seating positions in every motor vehicle manufactured (Advocates for Highway and Auto Safety, 2013). In 1971, FMVSS 213 came into existence. The law was later amended in 1981, 1991 (requirement for frontal airbags in every vehicle), and 1996 (Advocates for Highway and Auto Safety, 2013). FMVSS 213 proclaims specific requirements for child passenger restraints systems (infant seat, convertible seat, booster seat) (Advocates for Highway and Auto Safety, 2013). It governs the performance standards for CPSS up to 50 pounds including (a) crash worthiness, b) labeling including air bag warnings, c) seat instructions, and d) seat flammability (Advocates for Highway and Auto Safety, 2013). In 1999, FMVSS 225 stated that all vehicles must be equipped with child restraint anchorage systems that are standardized and independent of the vehicle seats. Phrase two of this law requires all car manufactures to produce cars with lower and upper attachment points compatible with the new car safety seats (Advocates for Highway and Auto Safety, 2013).

Although these federal laws exist, each state is responsible for producing and implementing their own individual regulations. The National Safe Kids Campaign performed a study and systematic review of various child passenger state laws throughout the United States. *Child Passenger at Risk in America: A National Ranking of Child Occupant Protection* analyzed and determined that nearly half of all states had inadequate child occupant protection laws that secure the child in the vehicle securely (National Safe Kids Campaign, 2014). This study also found that most states (34) allowed the child to ride unrestrained in certain special circumstances, no state fully protected all child passengers ages 15 years and under, fines for noncompliance in 21 states were below an acceptable effective amount, and 28 states failed to mandate publicly funded education campaigns about child passenger safety (National Safe Kids Campaign, 2014). In addition, 35 state laws failed to assess penalty points on driver's license (more than half of the states allowed waiver of penalties) and 47 states failed to specify that the back seat is safest place to ride (National Safe Kids Campaign, 2014).

Despite these startling findings, all 50 states and the District of Columbia have passed some sort of child protection law, 32 states require that all children under the age of 15 years be restrained at all times (Safe Kids Worldwide, 2015). Forty-seven states required that child passenger seats be used properly, and six states offer child passenger safety classes as an option for violators (Safe Kids Worldwide, 2015).

Since the release of The Safe Kids Report, as of 2006, many states have altered and revised their occupant restraint law as well as their child passenger safety laws and

policies (with exception to New Hampshire who did not have an adult occupant restraint law) (Georgia Governor's Office of Highway Safety, 2014e). Eighteen states had seat belt restraint laws requiring all passengers seated in any position of the vehicle to be buckled up (Georgia Governor's Office of Highway Safety, 2014e). In addition, 38 states had some form of booster seat requirement. Of this number, seven states required children six years and under to be seated in a booster seat, 13 states required children seven years and under to be seated in a booster seat, and only two states (Tennessee and Wyoming) have CPSS laws for children eight and under to be seated in a booster seat (Georgia Governor's Office of Highway Safety, 2014e).

As of 2015, all states have some form of child passenger safety law requiring children (under the age of six or eight depending on the state) to be properly restrained in a CPSS (Safe Kids Worldwide, 2015). However, it should be noted that South Dakota child passenger laws are only for children five years old and younger and does not require the use of a booster seat (Safe Kids Worldwide, 2015). All states require children under the age of 19 years to be properly secured in a seat belt (no matter the vehicle's seating position). In addition, 36 states maintain primary enforcement laws (violator could obtain a traffic citation purely based on the law official's direct observation of the violation) (The Guide to Community Preventive Services, 2013).

In addition to the study performed by National Safe Kids Campaign, several other reviews have been conducted and assessed (US Department of Transportation & National Highway Traffic Safety Administration [US DOT NHTSA], 2002; 2014; 2015). The

Department of Transportation (DOT) has implemented numerous studies dating back to 1985. These studies range in topics from the evaluation of the effectiveness of child passenger restraints, guidelines for observing child safety seat use, and restraint use in 19 U.S. cities, to motor vehicle occupant safety surveys, evaluation of state occupant restraint laws/enforcements, and reports to congress on the effectiveness of safety belt laws and injury/death incidence rates (US DOT NHTSA, 2002; 2015).

DOT has also performed research on the barriers to police enforcement on safety belt use laws, strategies to secure political influence for safety belt law enforcement, and long-term effects of employee-based programs to motivate safety belt use. Although DOT performed these studies, gaps still exist regarding bridging knowledge of CPS relate issues with current CPS marketing strategies and CPSS usage rates. The previous mentioned studies provided evidence that even though overall CPSS usage rates are on the rise, nationally there still exist a large amount of misusage rates present. In addition, parents are not receiving adequate education on proper CPSS use and installation methods (US DOT NHTSA, 2002; 2014; 2015). The rise of CPSS misuse coupled with lack of proper CPSS education therefore would most likely contribute to higher incidences of child-related motor vehicle deaths and injuries (both nationally and locally) (US DOT NHTSA, 2002; 2014; 2015).

In order to witness a change in these high death and injury figures, certain strategies must be set in place. Environmental modifications and practical, skill-based pedestrian safety training and education to children, parents, and the overall community

should be developed in order to demonstrate improvements in children's traffic behavior (Safe Kids Worldwide, 2015). In addition to environmental and education alterations, child occupant protection and safety belt laws must be developed and enforced uniformly nationwide (Safe Kids Worldwide, 2015; Weatherwax et al., 2015). In 2003, all 50 states, the District of Columbia, and all US territories have some form of child occupant protection law, varying widely in age requirements, exemptions, enforcement, procedures, and penalties (Safe Kids Worldwide, 2015). As previously stated, as of 2015 only 36 states have primary seat belt laws (stopping violation per initial observance of seat-belt and child safety seat nonuse/misuse) (Safe Kids Worldwide, 2015). Also, greater penalties, such as impounding the vehicles of drivers who are unlicensed or driving with a suspended or revoked license, are proven to reduce pedestrian deaths and injuries (Safe Kids Worldwide, 2015).

Locally

In Georgia (2005), roughly 347,653 traffic incidences occurred on the roadways (Centers for Disease Prevention and Control, 2009). Of that figure, 139,056 people suffered motor vehicle related injuries and 1,744 people experienced fatalities (an increase of 58%), including 31.5% of which were alcohol related (Centers for Disease Prevention and Control, 2009). From 2000-2005, the Georgia "unintentional injury death rate was 17.8 per 100,000 population; this was higher than the national rate of 15.0 per 100,000 population. In addition, transportation-related injuries had the highest death rate

among children 0 to 19 years of age (11.5 per 100,000 population)" (Centers for Disease Prevention and Control, 2009, para 1).

Every year in Georgia, approximately 40 children (ages 5-12 years) are involved in a motor vehicle related fatality (Georgia Governor's Office of Highway Safety, 2014c; Georgia Governor's Office of Highway Safety, 2014d). From 2008-2012, there was 4,598 child passenger related fatalities (Georgia Governor's Office of Highway Safety, 2014c). Of that number, approximately 20%-30% of the children were riding unrestrained (Georgia Governor's Office of Highway Safety, 2014c). In 2011, Georgia had approximately 877 vehicle occupant fatalities. Also, that same year, the metropolitan Atlanta area including Fulton, Carroll, Clayton, Cobb, DeKalb, and Gwinnett counties, represented 29% of the total number of roadway fatalities in the state (Georgia Governor's Office of Highway Safety, 2014d). Fulton County held the highest number with 61 deaths (Georgia Governor's Office of Highway Safety, 2014d).

Although not considered one of the largest counties in square footage (528.7 miles), Fulton County is large in population density and size (New Georgia Encyclopedia, 2014). The state of Georgia is comprised of 159 counties. In 2010, Georgia's population was 9,687,653. Of that number, Fulton County held the largest population at 920,581. In addition, in that same year, five of its ten cities were amongst the top 20 cities with the highest population (New Georgia Encyclopedia, 2014).

Fulton County rests in north-central Georgia. Due to its unique boundary lines, some portions of the county lay in both rural and urban areas (although the majority of

the county is urban) (United States Census Bureau, 2014). Fulton County is comprised of 10 cities, four in North Fulton (Sandy Springs, Alpharetta, Roswell, and Mountain Park) and six in South Fulton (College Park, East Point, Fairburn, Hapeville, Palmetto, and Union City) (United States Census Bureau, 2014). The state capitol, Atlanta, resides in the middle between North and South Fulton County. Demographically, Fulton County is quite diverse (United States Census Bureau, 2014; United States Census Bureau, n.d.). According to the state census in 2000, 48.1% of the residents were white, 44.6% of the residents were black, and 5.9% of the residents were Hispanic. For that same year, 24.4% of the residents were 18 years old or younger, while 8.5% were 65 years or older (United States Census Bureau, 2014). In 2013, the US Census Bureau reported that the county housed approximately 51% females and 49% males. From 2001-2005, the average high school dropout rate was 3.5% and the statewide crime rate was 80.1 (twice as high as the statewide average) (99% of which was considered either a violent crime or crime against property) (United States Census Bureau, 2014). In addition, from 2000-2004, the county unemployment rate was 5.1% (higher than the 4.1% for the state) (United States Census Bureau, 2014;). In 1999, the county poverty level was 15.7% (higher than the state's 13.0% rate) (United States Census Bureau, n.d.)

Which such a vast population, Fulton County Georgia is faced with a variety of health concerns. However, one of the bigger issues plaguing the residents is traffic-related injuries and deaths (Georgia Governor's Office of Highway Safety, 2015). These figures indicate a public health concern (throughout Georgia and Fulton County) and

have been associated with the high misusage/non-usage rates of CPSS coupled with the lack of parents' knowledge regarding CPSS compliance (Georgia Governor's Office of Highway Safety, 2015). Currently in Georgia, occupant protection laws exist which include specific child-geared guidelines/policies. However, these laws have not effectively reached parents within various communities due to the lack of proper enforcement and marketing strategies. This problem impacts not only the morbidity but also the mortality rates of child occupants because lower CPSS usage rates typically leads to higher rates of deaths and injuries to children (Georgia Governor's Office of Highway Safety, 2014a; Georgia Governor's Office of Highway Safety, 2015).

As of 2015, Georgia is one out of 36 states that enforces a primary safety belt law seat (Safe Kids Worldwide, 2015). This law allows police officials to stop motorist solely for being unbelted in a moving vehicle. In addition, the state of Georgia requires children ages 18 and under to be restrained in a vehicle regardless of seating position (Safe Kids Worldwide, 2015). Georgia law also requires children under the age of 8 (and less than 57" tall) in all seating positions (preferably in the rear seating position when available) to be properly restrained in a CPSS appropriate for the child's weight and height and in accordance to the CPSS manufacturer's instructions. In addition, children ages 5-8 to be restrained at all times with a booster seat (Safe Kids Worldwide, 2015). Although these requirements have been established, there exist some exemptions to the rules. These exclusions include (a) seating a child under the age of 8 in the front seating position in an approved appropriate child passenger restraint system if there is no rear seat available or

if all rear seating positions are occupied, (b) school buses, childcare vans, taxi-cabs, and public transit vehicles transporting children 4 years old and older, (c) utilizing a vehicle's lap belt only (if there is no lap/shoulder belt present) for a child over 40 pounds and (d) restraining a child under 8 years old and over 4'9" tall in a vehicle's safety belt instead of a booster seat (Safe Kids Worldwide, 2015).

Through the Governor's Office of Highway Safety (GOHS) and other public/private safety awareness programs, a difference is being made to reduce motor vehicle related injuries and death. Although these differences are present, Georgia's legislature should consider adding a well-crafted back seat mandate for its child passengers. Georgia's law should require all children eight years old and younger to be properly restrained in a child safety seat. In addition, all vehicles built after 2003 should come equipped with safety belts in all seating positions (Georgia Governor's Office of Highway Safety, 2014e). The law should also be changed to allow passengers to ride only in seating positions where safety belts are present and prohibit all passengers from riding in cargo areas of pickup trucks (Georgia Governor's Office of Highway Safety, 2014e; Safe Kids Georgia, 2014).

Georgia participates in the annual "National Child Passenger Safety Week." This week is typically held the second week in February and is designed to promote and educate communities about child passenger safety issues and concerns. In addition, several organizations within Georgia have established initiatives to promote child pedestrian safety (Georgia Governor's Office of Highway Safety, 2015). "International

National Walk to School Day" (observed the first week in October) is designed to promote safe walking throughout the state of Georgia, the United States of America, and across the entire globe (Georgia Governor's Office of Highway Safety, 2015). By providing education initiatives, safety affiliates throughout the state of Georgia have all partnered towards the reduction of motor vehicle and pedestrian injuries. Although these initiatives are present, providing additional education to drivers and children, incorporating pedestrian skills training into school health education curriculum, and improving/maintaining careful adult supervision of young children crossing the roadways are needed (Georgia Governor's Office of Highway Safety, 2015; Weatherwax et al., 2015). Stricter enforcement of traffic laws for adults, education programs for adults and children, and providing sidewalks for all streets and roadways will also help reduce the pedestrian-related fatalities and injuries. Georgia's home builders' associations, community activists, and concerned citizens should assist in the building of communities designed with sidewalks, bicycle paths, and roadways. These initiatives would aid in the reduction of child-related motor vehicle and pedestrian injuries and deaths (Georgia Governor's Office of Highway Safety, 2015).

The topic of child passenger safety research has recently surfaced on the health front in the past decades. This new phenomenon has become one of the most sought-after research topics, especially in regard to occupant safety (Safe Kids Worldwide, 2015). Previous studies related to child occupant safety included research techniques ranging from knowledge-based assessments (through educational campaigns) to behavior

modifications regarding proper restraint use (Safe Kids Worldwide, 2015). Although there exists a wide variety of research procedures, only a few could be classified as "dominant" protocols, including participant observations and secondary data surveillance (Safe Kids Worldwide, 2015).

Occupant Protection Surveillance Systems

Public health surveillance aids health officials in recognizing, reporting, and evaluating health information (Centers for Disease Control and Prevention, 2014d). Surveillance also focuses on the assembling, distributing, and applying of various forms of public health initiatives. Presently there exist limited public health surveillance systems geared primarily to child motor vehicle injuries and deaths. Because of this fact, general motor vehicle injury/mortality surveillance databases are primarily used. The information contained in these systems range from general injury and mortality data to more specific crash and occupant reports. In order to acquire productive public health motor vehicle crash surveillance, many agencies have developed systems that limit the possibility of potential challenges. Some of the sources of data utilized for acquiring fatal traffic-related injuries include vital records, medical examiners/coroner's system, child fatality reviews, and Fatal Accident Reporting System (FARS). Similarly, non-fatal injury information is attained through hospital discharge data, trauma registry data, the National Hospital Discharge Survey, the National Health Interview Survey, and the National Electronic Injury Surveillance System (NEISS) (Centers for Disease Control

and Prevention, 2014d; US Department of Health and Human Services, Public Health Services, n.d.).

In addition to the tribulations regarding child motor vehicle injury/death surveillance, the collection and evaluation of general nonfatal injury information poses as a major obstacle (American Academy of Pediatrics, 1999). This obstacle is attributed to three factors: (a) morbidity data is usually collected at a national level and cannot be distinguished for state and local statistics, (b) the current injury reporting system is typically slow in nature (with lag time ranging from months to years), and (c) not all states have adequate hospital-based reporting systems (reducing the likelihood of locating cause of injury) (American Academy of Pediatrics, 1999).

Many surveillance systems aimed at childhood traffic injuries and deaths are not inclusive in nature, particularly due to the limited sample size (American Academy of Pediatrics, 1999; Durbin, Curry, & Myers, 2011). Most of the information gathered pertains to adults (drivers as well as occupants) and rarely produce accurate representative figures for children. For the existing surveillance systems that analyze child-related motor vehicle incidences, mortality is typically the factor at hand. Surveillance systems that focus on motor vehicle injury outcomes are divided into three unique categories (laboratory-based, hospital-based, and large-database research). Laboratory-based research examines child restraint devices, vehicle design, and occupant protection (controlled environment using child dummies) (Mirman et al., 2015). Hospital-based research is conducted in a hospital (or group of hospitals) and entails evaluating

injury risk factors (seating position or restraint use) for small sample sizes through crash investigation. Large existing databases, such as NHTSA's National Automotive Sampling System (NASS), also evaluate through crash investigation and include data from police and crash reports. Typically, these databases encompass a large sample size and maintain data of traffic incidences regardless of crash location and medical treatment received. In addition to the three surveillance categories, motor vehicle crash monitoring is performed through information gathered by registries (vital statistics-national mortality reporting) and hospital-based information systems (discharge reports and emergency room records) (American Academy of Pediatrics, 1999; Durbin et al., 2011).

The National Occupant Protection Survey (NOPUS) "is the only probability-based observational survey of child restraint use in the United States" (Glassbrenner, 2005, p. 1). NOPUS provides information through nation-wide observations performed on child restraint use. Data is collected at randomly selected intersections (providing probabilistic means) between 8 am to 6 pm. for non-moving vehicles (stopped at traffic lights and/or stop signs). Information is gathered on various items including drivers, passengers (front and two rear seating positions), and children (age 0-12 months, ages 1-3 years, and ages 4-7 years). NOPUS involves non-participant observations and does not include interviews with drivers or passengers (Glassbrenner, 2005).

In 2004 the NOPUS survey was utilized to observe restraint use. The survey occurred June 7, 2004 through July 11, 2004 (excluding the holiday season of July 2-5, 2004). Data observed included restraint use of (a) children under 8 years old (0-12

months, 1-3 years of age, and 4-7 years of age), (b) children driven by (belted/unbelted drivers, male/female drivers, drivers age 16-24 years, age 25-69 years, age 70+ years, and race), (c) front/rear seat position, (d) expressways/surface streets, (e) traffic (heavy, moderate, and dense), and (f) passenger cars, vans/SUVs, and pickup trucks. In addition, information was gathered on regional areas, urban/rural, weekend/weekdays, hours, and restraint type (rear facing, forward facing, high back booster, safety belt/backless booster, or non-restraint) (Glassbrenner, 2005).

Information was gathered through the use of "complex multi-stage probability sample, statistical data editing, imputation of unknown values, and complex estimation and variance estimation procedures" (Glassbrenner, 2005, p. 7) as well as analyzed by Westat Inc. under the leadership of the National Center for Statistics and Analysis (NCSA). Data was compared for the years 2002 and 2004 for any related change and/or modifications (Glassbrenner, 2005).

Although the results indicated that over 90% of both infants (birth to 12 months) and children (1-3 years of age) were retrained, the results did not specify the restraint type (rear facing, forward facing, booster seat, or seat belt) (Glassbrenner, 2005). Instead, the data represents all restraint systems utilized not indicating proper restraint utilization methods. In addition, it was noted that (a) drivers who were restrained were more likely to restrain their children in vehicles, (b) an increase in the number of child passengers riding in the rear seating position, (c) a decrease in children being switched to forward

facing/booster seats before the designated age/weight requirements, and (d) an increase in infants restrained in vehicle seat belts and backless booster seat (Glassbrenner, 2005).

Another study involved secondary data surveillance to analyze the relationship regarding the usage rates of child passenger restraint systems compared to driver safety belts and restraint systems (Starnes, 2003). Data was obtained from NCSA and their related evaluating agency-FARS. FARS "investigates the association between the restraint use of child passengers involved in a crash and their drivers" (Starnes, 2003, p. 1). In order for information to be included in FARS database (a) at least one person involved in the crash must have suffered a fatality, (b) the crash must have involved at least one child 5 years old or younger, and (c) the crash must have involved one driver over the age of 16 years (Starnes, 2003).

Information was analyzed from the FARS database for the years of 1991-2001. In addition, information was evaluated from NOPUS for the years of 1996, 1998, and 2000 (at the time of the study, 2002 statistics was not available). The information reported included observational data from 1200 intersections (selected randomly) (Glassbrenner, 2005; Starnes, 2003). Results obtained demonstrated similar findings as the previous mentioned Starnes study (Starnes, 2003). A significant positive correlation was found between parent and/or driver use and child occupant restraint use. In addition, an increase was present for current child passenger safety restraint use compared to the mid-1990s. However, unlike the previous study (utilizing current direct observation), this study

analyzed secondary data obtained from NOPUS and FARS for specific years and periods (Starnes, 2003).

In 2001, an investigation was performed on the critical gaps in child passenger safety practices, surveillance, and legislation for the state of Georgia (Staunton et al., 2005). The purpose of the study was to examine the utilization of child occupant safety restraints as well as their related seating position (rear facing/forward facing; front seat/back seat) for children 0-12 years of age in Georgia. The study also attempted to evaluate the current surveillance mechanisms and legislation/policies associated with child passenger safety (Staunton et al., 2005).

A cross-sectional study was conducted in May and June 2001 (Staunton et al., 2005). The study was performed at various police roadblocks across Georgia through the utilization of a convenience sample. During the roadblocks, information was collected regarding child passenger(s) age and weight (through a parent interview), restraint type, and seating position (through direct observations). Information was collected by volunteers from the local police departments, State/County level Safe Kids Coalitions, the Georgia Department of Human Resources, and the Center for Disease Control and Prevention. Data was documented on a survey instrument that was specifically designed for the study. Data collectors were trained on the use of the instrument. The survey provided information on the intended information (child's weight, age, car seat type, and seating position). Unfortunately, it did not provide information on child restraint misuse (Staunton et al., 2005).

Data analysis was performed on children who were properly seated in the vehicle's rear seat as well as in the correct child restraint system. Evaluations was performed through the assistance of several variables including "number of children in vehicle, time of day, weekend versus weekday, and urban versus rural" (Staunton et al., 2005, p. 374). Cluster sampling was also used to configure statistical approximations. Survey means were used to configure result means, variance, and confidence intervals. Resulting information was compared to previous received data from the Georgia Statewide Use of Occupant Restraint Survey (survey used for yearly direct observations of restraint use for child passengers age 0-4 and seat belt use for people 5 years old and older) (secondary-data surveillance) in addition to the effectiveness of child passenger safety legislation and enforcement (Staunton et al., 2005).

Results from the study demonstrated the over 50% of the children observed were either restrained inappropriately or in the wrong seating position (infants seated in forward facing positions, children between the ages of 3-8 years old restrained in the vehicle's seat belt system, and/or children 9-12 years of age seated in the vehicle's front seat) (Staunton et al., 2005).When obtained results were compared to the Georgia Statewide Use of Occupant Restraint Survey, it was found that more than 70% of the documented children would have been initially missed or not observed (Staunton et al., 2005).

Motor vehicle fatalities and non-fatal injuries are marked as one of the nation's leading cause of death and injury (Meharry Medical College, 2004). In order to combat

this public health concern, it has been documented that several strategies should be implemented towards the reduction of unintentional injuries on the roadways. Some of these techniques include but are not limited to: (a) educating and informing high risk individuals (child passengers, teen ad older-aged drivers, and impaired drivers), (b) mobilizing communities and neighborhoods to assist in the promotion of legislative and systems modifications, (c) transforming physical traffic surrounding to more traffic friendly environments, (d) encouraging traffic-advocates for public policy and laws changes, (e) performing further research for in locating underlying causes of motor vehicle injuries and deaths, and (f) constructing more standard population-appropriate surveillance systems (Meharry Medical College, 2004).

Asset Mapping

Asset mapping is an approach that involves a more in depth, positive analysis of a community needs assessment (Social Design Notes, 2004; University of Missouri System and Lincoln University, 1999). Asset mapping helps to determine the solutions to the indicated issues, analyzes community assets (physical, individual, organizational, and financial), reviews possible resources (concrete and unquantifiable; internal versus external), assesses individual and community capacities/capabilities, and stresses community maintenance and sustainability (assists communities in recognizing and resolving their problems independently) (Social Design Notes, 2004; University of Missouri System and Lincoln University, 1999).

Fulton County, Georgia possesses a number of community assets. One of the primary assets of the county is the establishment of Safe Kids Fulton County (SKFC). Safe Kids is an international worldwide organization that focuses on preventing and reducing unintentional injuries for children from ages zero to fourteen. SKFC is a local coalition that is part of Safe Kids Georgia. The coalition is housed within the Fulton County Department of Health and Wellness. Its mission is to "reduce the number of unintentional injuries of children ages 14 and under through community partnerships, advocacy, public awareness, and distribution of safety equipment and education on its proper use" (Safe Kids Georgia, 2014). In addition, the coalition educates communities and health professionals about prevention techniques and strategies in several main areas. These areas include motor vehicle and occupational hazards, falls, burns, water-related injuries, choking, and poisoning (Fulton County Georgia Government, 2011; Safe Kids Georgia, 2014).

SKFC is known and recognized throughout the community (as well as state-wide and nationally) and has a strong relationship with the Safe Kids Worldwide (national office) as well as other related organizations with similar interest and concentration (local police and fire departments, hospitals, automobile dealerships, CPSS distributors and retailers) (Safe Kids Georgia, 2014; Safe Kids Worldwide, 2014a). The organization has a long-standing relationship with hospitals and neighboring public heath schools/programs (ex: Emory University and Morehouse School of Medicine) (Safe Kids Georgia, 2014; Safe Kids Worldwide, 2014a).

SKFC holds the ability to locate and support funding initiatives (via Safe Kids GA, Safe Kids Worldwide, General Motors Dealerships, and other institutions), provide educational, research, and technical assistance when necessary as well as develop and submit grants and cooperative agreements. (Safe Kids Georgia, 2014). Finally, SKFC offers opportunities for internships and trainings. The National Safe Kids Campaign also performed a study and systematic review of various child passenger state laws throughout the United States. Child Passenger at Risk in America: A National Ranking of Child Occupant Protection analyzed and determined that nearly half of all states had inadequate child occupant protection laws to secure children in vehicles securely (Safe Kids Georgia, 2014; Safe Kids Worldwide, 2014b)

Fulton County also possesses a variety of communication strategies/channels (interpersonal, community, and social marketing). Interpersonal channels offer an opportunity for one-on-one communication. These may include program staff/personnel, teachers, counsels, or health care workers. Even though interpersonal channels consume a great amount of time as well as affect a small number of participants at a time, it is deemed to be highly effective for creating changes in attitudes and behaviors (Fulton County Georgia Government, 2011). Community communication channels utilizations groups and organizations to promote a message. These channels tend to reach a larger audience than interpersonal channels while maintaining the same benefits. Social marketing allows for the availability to deliver messages to a large number of people. Social marketing could assist with the publicizing of the intended initiative along with

raise public awareness on certain health initiatives (Substance Abuse and Mental Health Services Administration, 2003).

These communication channels could also be utilized in regard to child passenger safety. Interpersonal channels could be used when addressing and presenting information to parents/caregivers and transporters of children. Safety information presentation could focus on a variety of actions steps and educational information for parents as they relate to motor vehicle and pedestrian safety (Substance Abuse and Mental Health Services Administration, 2003). Community communication could be used to disseminate materials such as brochures, pamphlets, and posters throughout the community. Community communication efforts could be geared towards special events such as fairs, festivals, parades, sports activities, health fairs, and other community celebrations. In addition, social marketing efforts could be utilized. Social marketing strategies are effective when the media relations are proactive, compelling, and newsworthy (timely and significant). "Using a combination of these channels will both ensure that the target audience is exposed to the messages and increase the chance that the message is heard, understood, and accepted" (Substance Abuse and Mental Health Services Administration, 2003, para 1).

In addition, Fulton County also has the availability to numerous external public health information systems (Fulton County Georgia Government, 2011). Although there exist limited public health surveillance systems geared primarily to child motor vehicle injuries and deaths, there do exists a vast number of general motor vehicle

injury/mortality surveillance databases. The information contained in these systems range from general injury and mortality data to more specific crash and occupant reports. Some of the available information includes vital records, medical examiners/coroner's system, child fatality reviews, and Fatal Accident Reporting System (FARS) (Fulton County Georgia Government, 2011). FARS, which functions through the National Highway Traffic Safety Administration, is a web-based encyclopedia for fatal crash information and one of the nation's leading agencies for acquiring and analyzing traffic fatality data/statistics and crash information such as occupant, vehicle, and risk factor(s) characteristics. Similarly, non-fatal injury information could be attained through hospital discharge data, trauma registry data, the National Hospital Discharge Survey, the National Health Interview Survey, and the National Electronic Injury Surveillance System (NEISS), Injury Surveillance Guidelines, and Georgia Statewide Use of Occupant Restraint Survey (US Department of Health and Human Services, Public Health Services, n.d.).

Geographic information systems (GIS) are other external assets of Fulton County. GIS are systems that are utilized by public health practitioners that assist with the visualization and analysis of data. GIS systems contain characteristics ranging from smaller systems (designed for individual use) to larger, enhanced designs (constructed for organization-wide use) (O'Carroll, Yasnoff, Ward, Ripp, & Martin, 2003). GIS also represent "computer systems that store and link non-graphic attributes or geographically referenced data with graphic map features to allow a wide range of information

processing and display operations" (O'Carroll et. al., 2003, p. 433). Geographic information systems are essential components in public health analysis. These systems are used to graph geographical data, map projections and coordinate various systems, conduct population-based evaluations, and represent spatial data (O'Carroll et. al., 2003).

Fulton County could possibly integrate the utilization of GIS mapping systems to detect the various types, locations, and factors related to traffic injuries and deaths. The county could assist with pin pointing out specific locals as well as certain characteristics and geographical similarities (O'Carroll et al., 2003). GIS mapping could also assist with in displaying the risk associated with certain geographical or environmental factors such as road markings, crosswalks, traffic and/or pedestrian signal lights, road medians, etc. In addition, GIS mapping could help determine the correlation or relationship between road conditions, time of day, demographics, age, gender, or city locals (urban versus rural) with participation in traffic occurrences (likelihood or percent of chance) (O'Carroll et al., 2003).

In addition, Fulton County could assess records collected at local hospitals and emergency rooms. Hospital records provide vital information pertaining to cause and mechanism of child-related injuries/deaths (American Academy of Pediatrics, 1999). These records also supply ample data that could be electronically coded and later regain for future epidemiological use. Hospital emergency room data supplies information on non-fatal motor vehicle injuries. Oppose to hospital discharge records, emergency room data are (a) detailed in nature, (b) could be obtained in a timely manner, and (c) provide

information on motor vehicle trends and I injury events (American Academy of Pediatrics, 1999; Stone, Morrison, & Smith, 1999).

Fulton County could also use the Georgia Statewide Use of Occupant Restraint Survey. This survey supplies information on the direct observation of child passengers (0-4 years of age) and adult passengers 5 years of age and older and their restraint mechanism (or the lack thereof) (Meharry-State Farm Alliance, 2005).

Furthermore, Fulton County could exploit the public health information systems. The NHTSA National Automotive Sampling System (NASS) could be utilized to evaluate crash investigation and data from police and crash reports. NEISS, sponsored by the United States Consumer Product Safety Commission (CPSC), could be used to acquire data from over 100 hospital emergency rooms and provide information on motor vehicle injuries related to unintentional (ex: motor vehicle), intentional, consumer products (product recall, public awareness campaigns, and product safety standards), and occupational injuries (Consumer Product Safety Commission, 2014; US Department of Health and Human Services, Public Health Services, n.d.).

Multidisciplinary Approach and Social Systems

A multidisciplinary approach involves bringing together a variety of disciplines, professions, specialties, and tactics to achieve a common goal or to solve complex problems. This approach is "composed of or combining several usually separate branches of learning or fields of expertise" (Dictionary.com, 2012). This approach has also been utilized within public health. The field of public health consists of numerous practitioners

from various disciplines and backgrounds. These disciplines may include, but not limited to health care providers, public health administrators, environmental health specialist, emergency management teams, and health educators to name a few. Each of these disciples provides their own unique way of combatting public health issues and outbreaks that may arise. Each of these disciples also encompasses their own individual strengths that the other groups may not share or display (NeuroCom, 2012).

The multidisciplinary approach to health assists with solving public health issues and concerns via a team of members (from various medical and public health disciplines). These members may examine the issue (through their own specialties), bringing forth a variety of information, perspectives, and insight. A multidisciplinary approach to health also provides several benefits (NeuroCom, 2012). These benefits may include "an increase in patient perception that their care is being managed by a team; greater likelihood of the delivery of care in accordance with national standards and clinical practice guidelines; an increase in patient satisfaction with care; and an increase in access to information, psychosocial and practical support for patients" (Palliative Care Curriculum for Undergraduate Students, 2014, para 2). Through these benefits, medical care and public health initiatives may be conducted in a more effective, efficient, and comprehensive manner, while simultaneously saving valuable time and resources (NeuroCom, 2012).

A multidisciplinary approach could be utilized in combatting childhood unintentional injuries. This approach could be accomplished through partnerships and

collaborations with a variety of organizations and institutions. These affiliations could include (but not limited to) the Safe Kids organization (local, state, and national chapters), state and local health departments, state offices of highway safety and departments of transportation, insurance companies (health, auto, and home), local police and fire departments, business owners, politicians, media outlets (radio, television, and internet sources), schools, health organizations, civic organizations, and community service organizations (NeuroCom, 2012).

Another technique that could be utilized in injury prevention and promotion is the social systems/social ecological approach. Social systems are very vital and necessary pieces of public health. Public health involves not only individual concerns, but also social issues as well. These matters could be managed through the utilization of social systems within health initiatives (Bandura, 2004).

The social ecological approach to health promotion considers the composition of social systems and the population at risk and is viewed as a function of individuals and the environment in which individuals live, including family, social networks, organizations, schools, hospitals, community, and public policies (Centers for Disease Control and Prevention, 2013). Individual behavior is influenced by determinants at these various environmental levels. In order to produce change behavior (in any population), the entire social network must be known and understood (Centers for Disease Control and Prevention, 2014c). Social networks include the individual or population at risk, the immediate surrounding community, and society as a whole. Social networks examine

how each individual level (individual, relationship, community, and societal) interacts with each other. This examination also looks at how each level could assist with altering health issues (individually and as a whole). The individual level investigates biological and personal attributes related to the health issue. The relationship level analyzes bonds made with small intimate groups such as immediate friends, family, partners/spouses, etc. and how these bonds could affect the development (or reduction/elimination) of the health issue. The community level evaluates how the local communities (schools, businesses, places of worship, hospitals and health clinics, and government agencies) interaction affects the health issues. The societal level looks at social and cultural norms including politics, economics, SES, education, etc. In order to achieve immediate effects, it is sometimes necessary to focus efforts on the identified individual(s) and their community (Centers for Disease Control and Prevention, 2013; 2014c).

Community organization has its roots in theories of social networks and support (US Department of Health and Human Services, National Institute of Health, 2004). Community organization emphasizes active participation and the development of communities that can better evaluate and solve health and social problems. Community organization is the process by which community groups are helped to identify common problems or goals, mobilize resources, and develop and implement strategies for reaching their goals (National Institutes of Health, 2013; US Department of Health and Human Services, National Institutes of Health, 2004).

Community organization involves locality development (community identify and solve their own problems), social planning (task goals and addresses substantive problem–solving), and social action (increase problem-solving ability of community and achieve concrete changes to redress social injustice). Community organization also deals with five main concepts including empowerment, community competence, participation relevance, issue selection, and critical consciousness (National Institutes of Health, 2013; US Department of Health and Human Services, National Institutes of Health, 2004).

There are two essential social systems with which virtually all children and families have routine significant contact: school and health care settings. The school is an environment wherein children not only engage in academic learning and growth, but where they also experience social and emotional interactions with adults and peers so as to build self-esteem and social competence (Paavola, 1995).

Social systems coupled with social networks are essential in public health. These systems and networks both assist with building community competencies (how it's currently functioning), community capacity (current competence as well as existing and potential future resources) and its social capital (ability for members to cooperate and form new ties based on trust) (Kreuter, Lezin, & Green, 1997). Social systems display resources located in the community that are primarily under the community control such as household income, businesses, citizen associations, and cultural organizations. Social systems also place a focus on resources that are located in the community but controlled by outsiders, such as hospitals, school systems, police and health departments, and social

service organizations as well as resources located outside the community and controlled by outside agencies such as capital improvement expenditure and public information (Kreuter, Lezin, & Green, 1997). Developing a community infrastructure for health can have a significant impact on environmental, behavioral, and lifestyle factors. The creation of new 'social systems for health' within the community has been identified as a major new area for health promotion development, with a vast potential for population health status improvement (Harrison & Mort, 1998).

A new social system contract for health would entail participation from the government, local players and communities, and individuals. The government will be responsible for (a) providing national coordination and leadership, (b) ensuring that health policies are in the best interest of the public, (c) working with other countries to improve health, (d) assessing and clearly communicating risk to the public, (e) ensuring that the public have all necessary information to improve their health, (f) regulating and legislating when necessary, and (g) tackling the root cause for all illnesses. Local players/communities' duties will entail (a) providing leadership for local health strategies by developing and implementing health improvement programs, (b) working in partnership to improve the health of local people and tackle the root cause of illnesses, and (c) planning and providing high quality services to everyone who needs them. Individuals must begin (a) taking responsibility for their own actions and health, by choosing healthy lifestyle, (b) ensuring their actions do not harm the health of others, and

(c) taking opportunities to better their lives and their families' lives through education, training, and employment (Harrison & Mort, 1998).

In order for social systems to be effective in health promotion and behavior, it must realize the importance of each individual member. Social systems could provide much needed programmatic support in addition to assist with program ownership, capacity building, community self enhancement, and program sustainability (Harrison & Mort, 1998). Utilizing the ecological approach to health promotion will prove to be beneficial and effective for both the intended population groups, as well as society as a whole. In addition, the acknowledgement and utilization of social systems coupled with the social marketing theory will help to enhance not only health education and promotion, but also positive behavioral change (Harrison & Mort, 1998).

It not only takes a team of professionals, but also the community as a whole to solve these issues in an efficient and cost-effective manner. The multidisciplinary and socio system/ecological approaches are essential pieces in health care and prevention. These strategies would have a greater impact on not only the individuals but on the nation as a whole. This is accomplished by assisting in the reduction of disease and illness incidence rates (decreasing the burden of disease) caused by motor vehicle traffic incidences (Harrison & Mort, 1998).

Summary

Traffic crashes are leading the nation in deaths and injuries for all ages. Not only are they affecting the driving population, but they also hold negative effects towards our

younger generation (14 years old and under), primarily children under the age of eight (Grossman, 2000). In order to improve the current situation, certain issues need to be addressed and recognized. These concerns include but are not limited to the rising number of motor vehicle related deaths and injuries to child occupants, the non-standardization of CPSS laws and policies, better marketing and advertising strategies, the need for updated and more detailed occupant protection surveillance systems, and the limited acknowledgement of the benefits of social systems. These issues should not only be addressed on the national level, but locally as well. Once these factors have been addressed, then and only then would we begin to see a decline in child occupant related mortality and morbidity rates. The upcoming chapter provides insight on the general design and methodology of the study including rationale; inclusion, sampling, recruitment, data collection, and instrumentation criteria; evaluation strategies; as well as validly/reliability and ethical concerns.

Chapter 3: Design and Methodology

Introduction

Chapter 3 contains information on the design and methodology associated with the study. This chapter includes information regarding the research design and rationale, pertinent aspects of the population, sampling techniques, and data collection strategies including instrumentation and materials (intended versus actual collection strategies). In this cross-sectional study, I used primary data from child safety seat events, the review of CPSS-related marketing materials, and nonparticipant observations. In addition, I outline factors regarding variables (independent and dependent); data collection, management, and quality control procedures; data analysis plan; threats to validity; and ethical issues for human subjects.

The purpose of this cross-sectional study was to provide an in-depth analysis of the factors that relate to CPSS use in Georgia. I used the DOI and the social marketing theories to understand the correlation and effects of parents' knowledge of CPSS compliance and CPS marketing technique to CPSS usage rates. The study also included the following variables: Independent variables (IV):

- Parents' knowledge/understanding of proper CPSS installation techniques
- Parents' knowledge/understanding of CPS laws and regulations (policy and enforcement strategies)
- Parents' knowledge/understanding of CPS marketing strategies
- Parental demographics (gender, SES, education level, and ethnicity)

The dependent variable (DV) included the following

- CPSS use (and usage rates)

I attempted to control for SES, education, and gender of parents in Fulton County, Georgia.

Research Design and Rationale

The study was quantitative in design and consisted of a cross sectional, convenience sample with systematic random selection. A quantitative study is classified as the numerical representation of research objectives geared towards scientific explanation. A cross-sectional study could be best categorized as a study conducted with the use of surveys. Surveys are "designed to provide quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of the population" (Creswell, 2003, p. 153). Quantitative scholars can use several sampling techniques in data collection, including probability sampling (which can be random and matching), and nonprobability sampling (which can include convenience, purposive, snowballing, and quota sampling (Babbie, 2004; Creswell, 2003; Simply Psychology, 2008).

The study consisted of a cross-sectional convenience (nonprobability) sample (as well as systematic random selection). Cross-sectional studies aid with attaining population groups that might hold comparable features, experiences, and circumstances. Cross-sectional studies also "take place at a single point in time, does not involve manipulating variables, allow researchers to look at numerous things at once (age,

income, gender), and often used to look at the prevalence of something in a given population" (About Education, 2014, para 6). The convenience sample included participants filtered from various CPS event locations (three) throughout Fulton County, Georgia.

Methodology

Study Population

The research population included adults (parents) who were filtered from CPSS event locations within Fulton County, Georgia. Information was gathered and analyzed for a 3-month period. The population was filtered through one of three separate CPSS check-up locations held in three sites in Fulton County, Georgia. Parents were defined as any person(s)/caregiver who were legally considered the custodian of a child riding in the vehicle at the time of the CPSS check-up event.

I expected to reach approximately 120 participants with at least 81-90 who successful completed the project. These numbers (81-90) included the loss of approval by study participants and/or the non-presence of an authorized parent/guardian. The sample amount was chosen by the rationale that there should be a minimum of 30 participants per studied independent variable (30 x 3 = 90). Therefore, there was a minimum of 30 participants reached per study site: 3 sites x 30 participants = a minimum of 90 total study participants (Laerd Statistics, 2012c). A sample size tabulation (Appendix A, Table 1) was conducted for this study. Through a *t* test linear multiple regression assessment, I determined that a sample size of 81 would be sufficient.

In addition, I used power analysis as well Cohen's multiple regression correlation table and formula. The power analysis assists with determining adequate sample size. University of Wisconsin-Madison (2016) stated, "Power, by definition, is the ability to find a statistically significant difference when the null hypothesis is in fact false, in other words power is your ability to find a difference when a real difference exists" (para 1). To calculate a study's power, the study's alpha value, effect size, and sample size must all be known. In general, the bigger the effect size, the greater the sample size of the study. In addition, the higher the alpha value, the larger the statistical significance (Power and Precision, 2016; University of Wisconsin-Madison, 2016). Through the use of Cohen's multiple regression correlation table and formula ($f^2 = \frac{R^2}{1-R^2}$) (East Carolina University, 2016) (that uses the number of predictors to help determine the effect and sample size), I determined that in order to produce a medium effect, a sample size of 81 should be used.

Although 81-90 study participants (surveys) were anticipated/expected, only 93 surveys were distributed, and 71 surveys were returned (76.34% return rate). However, not all the 71 surveys were completed (with only 36 surveys used for full completion-50.70% completion rate). This completion rate was possibly due to administration and completion time of the survey, the length the survey, and the time availability of the participants. Due to these issues, the *N* total was based on the completed survey items selected for the analysis. In addition, several analyses were performed (various cross tabulations and linear regression analysis).

Inclusion Criteria

A study sample could be classified as generalizable representation (or a subset) of a population. Samples are typically used in research when trying to determine effects of a population or a group (from the population). When using samples, certain concepts should be taken into consideration. These considerations include sampling design (probability or nonprobability), sampling size (standard errors and confidence intervals), and non-sampling errors (Frankfort-Nachmias & Nachmias, 2008).

In this study, the overall population size for Fulton County, as of 2014, was 920,581. The study included four predictors (parents' knowledge/understanding of proper CPSS installation techniques, parents' knowledge/understanding of CPS laws and regulations, parents' knowledge/understanding of CPS marketing strategies, and parental demographics). Consequently, it was expected that there would be between 40 and 60 cases (following the 10-15 cases per predictor rule). However, the larger the sample size, the better. Therefore, Cohen's multiple regression correlation table and formula was used. Cohen's table and formula uses the number of predictors to help determine the effect and sample size. Using this strategy (for four predictors), to produce a small effect, a sample size of 599 could have been used. To produce a medium effect, a sample size of 81 could have been used. To produce a large effect, a sample size of 38 could have been used. Hence, I attempted to include between 81-120 participants (medium effect size) to account for loss to follow-up and/or incompleteness of the program. I had hoped that the sample size would aid in acquiring research finding/data that could be generalized in

order to explain CPSS usage-related issues in Fulton County, Georgia. However, it should be noted that there is "no way of estimating how representative of the population the convenience sample would be. Therefore, it would be difficult to estimate the population's parameters from the values of the characteristics obtained from the sample" (Frankfort-Nachmias & Nachmias, 2008, p. 168).

Sampling

Nonprobability and Probability Sampling

Probability sampling is used to determine that every member of the designated population group would have an equal opportunity in participating in the study (thus providing probability specifications and a true data/study representation). Probability sampling typically includes the use of simple random, systematic, stratified, or cluster samples (Laerd Statistics, 2012b).

I attempted to use nonprobability convenience sampling methods. Nonprobability sampling does not involve probability specifications. In addition, it does not guarantee that every member of the designated population group would have an equal opportunity of participating in the study. However, nonprobability sampling is more widely used due to the presence of less restrictions and limitations. Nonprobability sampling typically includes the use of convenience, purposive, and quota samples (Frankfort-Nachmias & Nachmias, 2008).

Nonprobability methods include purposive and quota sampling. Purposive sampling involves the use of the researcher's subjective judgment to select study

participants. This type of sampling is typically used to understand certain characteristics or features of a population group (not necessarily to make generalized statements about the population). Purposive sampling could be used with smaller group settings and mixed methods (or sometimes qualitative studies). There are various types of sampling strategies that could be used during purposeful sampling (such as maximum variation, homogenous, typical case, extreme case, critical case, total population, and expert sampling). However, it was determined that this strategy may not be an appropriate fit for this study because it was challenging to calculate an accurate probability account as well as it provided a higher than normal chance of selection bias and prejudgments. This limitation may be especially true "where judgements have not been based on clear criteria, whether a theoretical framework, expert elicitation, or some other accepted criteria" (Laerd Statistics, 2012a, para 1). In addition, it may be difficult to provide a full explanation and justification as to why and how the particular subpopulation was selected (Frankfort-Nachmias & Nachmias, 2008; Laerd Statistics, 2012a).

Quota sampling divides members of the population into groups or stratas and entails the selection of a subpopulation group that is similar in nature and feature to the overall population group. This selection could be achieved by the review and association of study variables and characteristics. However, it was determined that this strategy may not be an appropriate fit for this study (Frankfort-Nachmias & Nachmias, 2008a; Laerd Statistics, 2012d). As with purposive sampling, quota sampling may provide a challenge when trying to calculate an accurate probability account. Also, it may be difficult to

calculate sampling error, it may be difficult to generalize results (due to the lack of randomization), and sampling bias may be present (Frankfort-Nachmias & Nachmias, 2008; Laerd Statistics, 2012d).

Because group members are divided into groups (strata), each member of the population unit (subpopulation group) could only exist in one and only one group (mutually exclusive). This definition may be difficult for participants who may classify themselves in multiple ways (such as when describing demographical, educational, or occupant characteristics). If problems arise with the classification of group members, it may increase the time and cost associated with conducted a study (Frankfort-Nachmias & Nachmias, 2008; Laerd Statistics, 2012d).

Although not used in this study, probability sampling should be conducted in research when possible. Scholars use probability sampling to determine that every member of the designated population group would have an equal opportunity in participating in the study (thus providing probability specifications and a true data/study representation). Probability sampling aids with providing the best overall generalizable and statistically sound results. Probability sample includes simple random, systematic, stratified, or cluster samples. Simple random samples/selection is the fundamental design used in probability sampling. This type of sampling entails the "procedure that assigns to each of the sampling units of the population an equal and known non-zero probability in being selected" (Frankfort-Nachmias & Nachmias, 2008, p. 169).

Systematic sampling entails "selecting every Kth sampling unit of the population after the first sampling unit is selected at random" (Frankfort-Nachmias & Nachmias, 2008, p. 171). A systematic sampling design typically holds more convenience and ease when compared to simple random sampling (especially in regard to larger population groups; Frankfort-Nachmias & Nachmias, 2008; Laerd Statistics, 2012g). Stratified sampling involves the insurance that various population groups/units will be represented in the study (thus strengthening the accuracy and estimated parameters of the study). Characteristics of the subpopulation groups are stronger than the characteristics of the overall population (through the division of homogenous strata; Frankfort-Nachmias & Nachmias, 2008; Laerd Statistics, 2012f). Cluster sampling entails the use of large groups (or clusters) that then are broken down into smaller units (via simple random or stratified sampling). In addition, cluster sampling is considered more cost effective than its counter parts simple random and systematic sampling (Frankfort-Nachmias & Nachmias, 2008).

Sampling Procedures

I used a quantitative analysis of CPSS-related issues. This analysis involved the investigation of how current CPS issues as well as CPS marketing strategies related to CPSS usage in Fulton County, Georgia (via the administration of surveys and review of secondary data). I used the following IVs: predictors parents' knowledge/understanding of proper CPSS installation techniques, parents' knowledge/understanding of CPS laws and regulations (policies and enforcement strategies), parents' knowledge/understanding CPS marketing strategies, and parental demographics (gender, SES, education level, and

ethnicity- although these variables were attempted to be controlled). I also used the DV of CPSS use.

The study consisted of a cross-sectional convenience (nonprobability) sample (as well as systematic random selection). The purposed audience for the study included individuals (parents/caregivers) who resided in Fulton County, Georgia. The convenience sample was filtered from various CPS events (three) throughout Fulton County, Georgia. Although the initial recruitment technique was based on a convenience sample, the study held some elements of randomization. Within the initial convenience sample, all vehicles (including parent occupants) were randomized systematically to only include participants riding in every other vehicle. This way, participants were filtered through the associated CPSS check-up location and maintained an equal and fair chance of participating in the study.

The rationale for the research design and sampling strategies (nonprobability convenience sample) was because it would be challenging to use a probability sampling design as well as pilot a true randomized control trial (RCT)/experiment (Laerd Statistics, 2012b). This was due to the limited availability of required resources. These resources included limitations on budget/funding (financial challenges and restrictions), time, and human power necessary to conduct a generalizable study (via a random probability sampling design). I attempted to reach approximately 120 participants (to account for loss to follow-up and/or incompleteness of the program). Of this amount, roughly 81-90 were expected to participate with the surveys. However, only 93 surveys were distributed, and

71 surveys were returned (76.34% return rate). In addition, not all of the 71 surveys were completed (with only 36 surveys used for full completion-50.70% completion rate).

Sampling Estimations and G*Power Analysis

Sample size could be determined in various ways (Field, 2013; Trochim, 2006). These methods could include power analysis, tabular, cumulative distribution, and stratified sampling to name a few. When calculating sample sizes for quantitative research designs, it is a good idea to consider several factors. These factors include the desired confidence level and interval (power =.8 and alpha= .05), effect size (.05), the overall/total population size, and the number of variables present. In addition, other factors may include sampling strategy, percentage of desired response, and cost and feasibility. The use of power is typically the less robust method of calculating sample size. As power increases, the likelihood of effect increases. However, as power increases, so does the opportunity for acquiring Type 1 error. Power could be performed manually (via predetermined mathematical formulas and tables) or via computer online calculators or software programs. These programs include G*Power, statistical package R (power package), nQuery Advisor, Power and Precision, and Power Analysis and Sample Size (Field, 2013; Trochim, 2006).

Typically, the larger the sample size the better. This amount could fall anywhere between 30 (for smaller studies) to 400 (for larger studies). In addition, the larger the sample size the smaller the confidence interval. However, it should be noted that the relationship between the two factors (sample size and confidence interval) are not linear

(Creative Research Systems, 2012). Some factors should be taken into consideration when determining sample size, such as the purpose of the study, the overall population size, the parameters of the study and expected confidence intervals, and the tools that would be utilized in the study (Creative Research Systems, 2012; Dissertation India, 2011).

Since the study yielded a small sample sized (N=36), it may be assumed that the small sample size could have attributed to the negative study results. The larger the sample size, the smaller the standard of error and confidence interval and vice versa, the smaller the sample size, the larger the standard of error and confidence interval (Creative Research Systems, 2012; Dissertation India, 2011).

Procedures for Recruitment, Participation, and Data Collection

The initial data collection methods for the study entailed information gained from the three child passenger safety events. The events occurred in various locations in Fulton County, Georgia. The intended participants included adults (parents of children who are eight years old and younger). The population consisted of a convenience sample filtered from the three various locations. The information solicited included data retrieved from surveys, CPSS related marketing materials, and non-participant observations. The collection of surveys took place at various times of the day (to assist with reducing response bias or skewed results or sampling).

Attempts were made for the gathering of surveys to be broken into two phases. Each phase was performed simultaneously, independent of one another. Phase one

utilized aspects of the US Department of Health and Human Services (National Cancer Institute) Planner's Guide: Making Health Communication Programs Work (US Department of Health and Human Services, National Institutes of Health, 2004). This document guides health communication specialists on techniques on how to develop, pretest, implement, and evaluate health communication products. Certain questions were placed on the self-administered survey including product content information (type of health communication outlet, name of the product, sponsoring agency, product objectives, and primary and secondary intended audiences) as well as users' perception of these products (how would they classify themselves-parent, did the product influence the use of CPSS, was the product effective, and would they recommend the product to others) (US Department of Health and Human Services, National Institutes of Health, 2004). As mentioned above, these questions were placed on the self-administered survey and distributed at events.

The participants were asked to fill out and sign the survey. I in turn, viewed the child(ren) placement in the CPSS and the CPSS placement in the vehicle. In addition, for each CPSS observed, there was a child passenger safety checklist associated with it (e.g.-one checklist per CPSS: if a parent has two children, there were two checklists for the parent to fill out). The child passenger safety checklist included information on (a) participant(s)' demographics (parent and child name, place of residence, contact information, and vehicle model/make information) (although the participants were not obligated/required to complete this portion), (b) CPSS related information (make/model,

how it arrived in vehicle-based on installation and use, seat type appropriateness for child, and misuse observed), (c) distribution of educational information, and (d) reference and resource sections (Safe Kids Georgia, 2014; Safe Kids Worldwide, 2014b).

I was also charged with three responsibilities: a) to pass out and answer any questions related to the consent/assent forms and the self-administered survey, b) to perform a review of the participants' vehicle which would include an investigation of both CPSS use/misuse and parent's usage of the vehicle's seat belt system and c) to verify that each form (including the consent form, survey and checklist) was filled out completely including documentation of both the signature of an authorized parent/guardian and date of event. After the completion of the forms, I inquired if there were any further questions and proceeded to turn in the completed and signed form. I then commenced to work with the next available parent.

Data collection guidelines from the American Automobile Association (AAA) Foundation for Traffic Safety were utilized to gather study participant information. The AAA Foundation for Traffic Safety, with the assistance of TransAnalytics, Inc., composed a guidebook for observing restraint use and misuse amongst motor vehicle occupants (AAA Foundation for Traffic Safety, 2005).The guidebook consists of several topics including targeted population groups, survey design and construction, sampling techniques, field equipment, methodology (moving traffic, controlled intersection, parked traffic with minimal interaction, parked traffic with high volume interaction, and parked traffic with high volume interaction and law enforcement), and data analysis (AAA

Foundation for Traffic Safety, 2005). As previously stated, the study expected to reach approximately 120 participants with at least 84-90 that successful completed the project. This number (84-90) included the loss of approval by study participants and/or the non-presence of either the child or an authorized parent/guardian (AAA Foundation for Traffic Safety, 2005).

Phase two consisted of the review of marketing material via several techniques. These techniques included study participants' responses to the self-administered questionnaires. It also encompassed observations (non-participant) and the investigation of the participants' awareness and knowledge of the amount of public service announcements (PSAs) marketed, the amount of billboard advertisements exhibited, the various mass media outlets employed, and the amount of CPSS educational materials disseminated for the three designated locations. It also entailed gathering data through the standard methods utilized by Agency for Toxic Substances and Disease Registry (ATSDR) Evaluation Primer on Health Risk Communication Programs and ORISE CDCyergy CD. The purpose of this technique was to observe the number of PSAs, billboard advertisements, various mass media outlets, and number of CPSS educational materials produced in addition to the effectiveness of these products (through examination of agency's current evaluation methods) as they relate to CPSS usage (Agency for Toxic Substances and Disease Registry, 1994; Oak Ridge Institute for Science and Education, n.d.).

ATSDR Evaluation Primer on Health Risk Communication Programs provides assessment questions on assessing health communication efforts. Questions associated with this tool would address issue related to the number of people reached (evaluating the marketing process). These questions included the number of PSAs developed, the number of billboard advertisements displayed, the various mass media outlets utilized (number and amount of air time played as well as thee estimated audience reached), and the number of CPSS educational materials produced (print coverage, estimated readership, and number distributed) for the three designated locations. In addition, attempts were made to measure communication objectives (Agency for Toxic Substances and Disease Registry, 1994).

The CDCyergy CD assisted in the assessment of current health communications materials. This was accomplished through the utilization of the provided resource tools and product evaluation sheets. The use of these two products contributed with the examination of the relationship and effectiveness of the various health communication products. In addition, an attempt was made to link the type of information and education involved to any behavior change and/or protection actions taken (Oak Ridge Institute for Science and Education, n.d.).

Surveys and questionnaires were utilized to collected information pertaining to community and individual health/safety behavior as well as information (and knowledge) on CPSS laws (national, state, and local level laws as well as regulations, and policies);

differences in the variety of CPSS; and CPSS installation tips and techniques. All the data collection methods were conducted throughout the county for a three-month time period.

The indicated data collection methods should have been appropriate for the study because they would have provided vital and relevant information pertaining to CPSS statistics, infant/child mortality/morbidity rates, current social media efforts (related to CPSS promotion), and state and local CPSS laws and regulation. These data collection methods should also have provided information pertaining to the intended community (including their knowledge and thoughts regarding CPSS issues and perceived strengths and weaknesses of CPSS laws and regulations. Community information was obtained through the utilization of child safety advocates data (local and state).

Although the initial data collection procedures involved retrieving data within a one-month period, data was actually collected throughout a three-month period (at three different sites throughout Fulton County Georgia) (due to the limited number of scheduled classes and events). In addition, the initial survey included a 10-page questionnaire, where the first four pages contained general CPSS questions (pertaining to the specific studied variables); a two-page pre/posttest given to the participants prior to the CPSS event; and a four-page observation opinion survey regrading marketing and advertisement strategies. However, it was noted (from the first two CPSS events) that the survey was too long, and participants were getting tired and frustrated regarding the amount of questions and time it took to complete the questionnaire. Therefore, the survey was reduced to the first six pages to allow and encourage participant involvement and

survey completion. Also, the CPSS events typically took place in the mornings and many of the parents came to the events with their young children. However, the young children required a great amount of attention and, unfortunately, many of the parents were unable to adequately and sufficiently complete the survey. Another issue included the locations where the instrument was administered (given at the onset of the CPSS events, within areas with limited writing space).

Due to these listed concerns, there existed possible selection bias as well as low completion rates (producing insignificant, non-generalizable results- true data representation of the county/state could not be made) (Simon, 2011). In addition, other issues could have stemmed from the above mentioned factors including sampling limitations (per cross-sectional convenience sample- the lack of true random sampling and the presence of selection bias), the incorrect or non-reporting of information or results (ex: child's demographics, vehicle's information, usage of CPSS and occupant restraint systems, etc.), the loss of participants to study follow up, as well as the limited time to conduct a long-term study evaluation (possibly due to limited resources-time, finances, and people) (Xiangxiang et al., 2016).

Data Analysis Plan

One of the main goals of programmatic research and analysis is to assess the impact of the program as well as to evaluate change of behavior. "Evaluation is essential to health programs because it provides feedback about whether risk messages are received, understood, and internalized by those for whom they are intended. Without

evaluation, it is impossible for program planners to choose health initiatives and channels more effectively. A lack of evaluation affects both quality of the specific risk prevention effort and the primary intended goal (improving public health)" (Agency for Toxic Substances and Disease Registry, 1994, para 1-2).

Data was interpreted using the various data analysis methods (deductive reasoning/coding, Cronbach's alpha, descriptive statistics, linear regression, and Pearson Correlation) (Laerd Statistics, 2013*).* Since assumptions were made about the population study in addition to the nominal format of the study instruments, a parametric test (Pearson Correlation) was used. The level of significance was set up as p .05. The study also used deductive reasoning. Deductive reasoning focuses on the transition from a generated hypothesis to a more specific conclusion through the utilization of observations. Deductive coding is a mechanism used thought out quantitative data analysis. Deductive coding involves the development of coding categories and codebooks, entry of collected data, and the distinction between univariate, bivariate, and multivariate analysis (Babbie, 2004).

Multiple Linear Regression

Multiple regression is similar in fashion to simple linear regression (using one independent variable to predict the value of a dependent variable). However, instead of using one independent variable, multiple regression considers two or more independent variables. Multiple regression analysis assists to form a linear model which helps to determine values of a dependent outcome variable from several predictive independent

variables (Field, 2013). Multiple regression helps to decipher the overall relationship for the variables (explain the variances) as well as the impact/contribution for each independent factor (predictor) (Laerd Statistics, 2013).

Underlying Assumptions of Multiple Linear Regression

Since the multiple linear regression test share characteristics similar to a linear design model, it holds and possessed some of the same assumptions and traits. These traits include that the related data would be normal or symmetric, that there would exist similar variances for multiple groups (homogenous), that the data sets would be independent in nature, and there exists a linear relationship between the variables (Field, 2013).

Multiple linear regression also holds supplemental assumptions including the fact that the dependent variable and the covariate are continuous (interval or ratio level); the independent variable is made up of two or more variables that could be either categorical (ordinal or nominal) or continuous (interval or ratio); the residual errors should be distributed normally (random with a mean of zero); the predictors (independent variables) should have non-zero variance value; and the observations of each group are independent from one another (which could be determined or checked by the Durbin-Watson test) (Field, 2013; Laerd Statistics, 2013). This test examines the errors and the serial correlation between them. Test results range from zero to four. A numerical result of two is equivalent to uncorrelated residuals (or errors). A numerical result greater than two means that there exists a negative correlation between residuals and a numerical result <2

means that there exists a positive correlation between residuals (Field, 2013; Laerd Statistics, 2013).

Other assumptions include that the linear relationship should be present between the dependent variable and each of the independent variables as well as collectively between all included variables. This assumption could be determined or checked through the utilization of scatter plots and/or partial regression plots. In addition, homoscedasticity (the measurement for the variances flow along the line of best fit) should be present/existent; outliners (points or data outside of the usual pattern flow) should not be present or significant; multicollinearity (where multiple independent variables are vastly correlated with one another) should not be present or significant; the predictors (independent variables) are not correlated with the external variables (variables that are not included in the regression model however affect the outcome variable); and that the residual errors are distributed normally (Field, 2013; Laerd Statistics, 2013). This assumption could be determined or checked through the utilization of "a histogram (with a superimposed normal curve) and a Normal P-P Plot or a Normal Q-Q Plot of the studentized residuals" (Laerd Statistics, 2018, para 14).

If it has been determined that all assumptions have been met, then it could be assumed that the regression model (from the sample) is the same as the population model. However, caution should be taken that even though it has been found that the assumptions has not been violated, the regression model from the sample may not be the

same of the population model (but instead, may increase the likelihood of the models' similarities) (Field, 2013).

Correlation and Causation

Special attention was placed on the distinction between correlation and causation between the independent and dependent variables. Correlation and causation are two terms that expresses the presence/non-presence of a link between variables. Although these two terms have been known to be used interchangeably in some regards, in the statistical realm, they hold two distinctive meanings. Correlation aids in the explanation of the relationship between two factors. It assists in the acknowledgement that an association does in fact exist between the indicated variables. Causation not only demonstrates a relationship, but in addition it explains the causal link between the items (ex: variable a cause variable b to occur) (Triola, 2004). Although correlation could exist by itself, without the presence of causation, causation on the other hand, cannot. To have a causal relationship, a correlation must also be present. Some errors associated with the use of these two terms may include (a) the misinterpretation of the actual relationship (ex: mistaking positive correlation for a perfect positive correlation, a positive correlation for a negative correlation, or a nonlinear relationship for a positive/negative correlation), (b) the miscalculations of the correlation coefficient, and/or (c) the miss-plotting of the scatter diagram (Triola, 2004).

In addition, the issue of CPSS compliance was presented through the use of indexes. An example of the index-construction model is:

Please check all that applied at the time of the traffic incidence:

- The harness clip strap was at armpit level.
- The child safety seat was in the back seat of the vehicle away from any active airbags.
- The child was in the correct type of seat based on age and weight requirements (infants: infant-only/rear facing convertible; toddlers: forward facing convertible/high back belt positioning booster with 5-poit harness; young children: belt positioning booster).
- The child safety seat was in the correct seating position (rear-facing: infant; forward-facing: toddler or young child).

The respondent received a point for each answer supplied. In forming the index, consideration was taken regarding item selection (face validity, variance, and unidimensional), empirical relationship (bivariate and multivariate relationships), index scoring, processing missing data, and index validation (item analysis, and external validation) (Babbie, 2004).

Special consideration was placed on the evaluation of outliners and influential points. Both outliners and influential points provide necessary and valid information regarding the data sets/variables. For the most part, outliners are easier to visually detect than influential points (based on the data plotted on the scattered diagram- point horizontally furthest away from others). Although visually, it may be easier to detect outliners, it still may be necessary to test for its true existence within the given data sets.

To test for the presence of either outliners and/or influential points, one should recalculate and re-plot the data. The data sets should not include the figure in question, therefore indicating the relationship of the omitted data to the remaining points (Triola, 2004).

Statistical Package for the Social Sciences

For additional assistance for evaluating the collected data, SPSS was utilized. SPSS is a statistical analysis computer software program that is used to determine statistically significant evaluations and relationships (ex: frequency and cross tabulations). SPSS also aids with managing data, tabulating regression models, and developing graphs and tables (IBM, n.d.). SPSS is widely known for its commitment to predictive analytics. In addition, SPSS could assist with the management of data, statistics (descriptive, t-test, correlation, factor/cluster analysis, etc…), regression models (linear/nonlinear, multiple, and logistic), and graphics (IBM, n.d.). Some advantages of SPSS are the ease of editing information, capability of importing/exporting data in/out of Excel, and the proficiency of data management and organization. SPSS also maintains the availability of storing original data separate from data results/outputs and possesses the accessibility of various statistical models (ex: linear and logistic regression) and convenience of a short learning curve (with easy to learn/use menus and tools) (BenefitOf.net, 2014).

Instrumentation and Materials

Surveys

Quantitative research designs could entail the utilization and implementation of experiments or surveys. Surveys assist with providing numerical interpretation of an intended population (or a section of the population) as well as their related feelings, thoughts, and attitudes concerning an issue(s) at hand. Surveys can be used for informative, clarification, and illustrative purposes (Babbie, 2004; Creswell, 2003; Simply Psychology, 2008).

Surveys are typically "used for descriptive, explanatory, and exploratory purposes" (Babbie, 2004, p. 243). Surveys generally are constructed to gather and evaluate observational information on a specific population. Some advantages associated with utilizing surveys are that they provide a generalize assessment of information (with limited opportunity for data interpretation error) as well as provide a standardized method of analysis. Surveys "can reach a large number of people relatively easily and economically, provide quantifiable answers, relatively easy to analyze, and is less time consuming than interview or observation" (Scibd, 2014). In addition, surveys may be more appropriate when searching for information that could be easily measured and analyzed (ex: demographics, SES, education levels, and employment) on the social level. Surveys could provide information (individual as well as group) pertaining to the community's current knowledge/attitude/beliefs regarding certain issues, available

resources, access to help, and strategies to reduce/eliminate the issues at hand (Simply Psychology, 2008).

Surveys could be administered in various ways including mail-out, telephone, internet, and personal interviews). Each method holds its own advantages and disadvantages. Mail surveys entail low cost to conduct; contain minimal bias errors; as well as provides high respondents' anonymity, greater time for response development, and access to a greater demographic and geographic population groups. However, surveys also hold some disadvantages. These disadvantages include that they should contain simple directions, instructions, and questions (in order to reduce confusion and misunderstanding), provide minimal opportunity to probe respondents for question/answer follow-up or answer clarification, provide limited control as to who actually completed the survey (was it the intended subject or someone else), as well as provide low response rates. Telephone surveys entail moderate cost to conduct as well as provide high respondents' rates, data quality, and access to a greater demographic and geographic population groups. However, their disadvantages include the respondents' unwillingness and hesitancy to answer uncomfortable questions; the ease for respondents to conclude the process, and the inability to gain insight concerning the respondents' immediate surroundings or environment (Frankfort-Nachmias & Nachmias, 2008).

Internet surveys allow for quick response, could reach large numbers or population groups, and are less expensive than other surveys (ex: mail-out surveys). However, their disadvantages include that although many people have access to cellular

telephones (and even computers and other electronic devices), there are at times situations and circumstances when access to the internet is limited. This could be due to financial constraints or limited internet availability in the area. In addition, certain population groups may not fully understand how to properly utilize the computer, much less the internet (such as the elderly and those who speak English as a second language). In addition, internet surveys may solicit high non-response rates. Personal interviews entail the flexibility of development and implementation; allow for the interviewer to gain and maintain control of the process; allows of high response rates; and supplies the interviewer opportunities to gain additional response clarification and information (via probing). However, the disadvantages of using personal interviews include the high cost for implementation, the presence of interviewers' biases; and the absence of respondents' anonymity (Frankfort-Nachmias & Nachmias, 2008).

No matter how the survey is disseminated, conducted, and/or implemented, several issues should be taken into consideration (Babbie, 2004). These concerns can include: the (a) appropriate question forms (question/statements; open-ended/closed-ended), (b) precise and exact questions/statements, (c) avoidance of double-barreled questions, (d) selection of competent respondents (e) questionnaire format (general/respondents, contingency/matrix questions, and ordering), (f) succinct and precise instructions, (g) questionnaire pretesting, and (h) administration (self-administered, interview, telephone, or by other advanced technological means). These concerns also include the clarity of survey instructions or directions; the presence of

survey pretesting; the administration and dissemination of the survey (self-administered, mail-out, telephone, internet, etc.); and a decision if the survey will include an analysis of new collected information or existing secondary data (Babbie, 2004; Research Design Review, 2012).

Development and Administration of Survey

For the purpose of the intended research, the study attempted to utilize on-site surveys (Appendices B, C, and D). The surveys were administered at various locations throughout the county. In addition, attempts were made to gather and evaluate information from the review of CPSS related marketing materials, and non-participant observations. The survey was developed with the influence of the AAA Foundation for Traffic Safety guidebook. The AAA Foundation (along with TransAnalytics, Inc) developed a guidance manual for monitoring occupant restraint use and misuse. It also contained samples of The National Occupant Protection Use Survey. This survey supplied national observational data regarding CPSS usage (AAA Foundation for Traffic Safety, 2005; Glassbrenner, 2003; US DOT NHTSA, 2015). Regarding the study, the survey was utilized at various times of day and locations (throughout the county) with assistance by SKFC (and the partnership with Fulton County and local city police and fire departments). The events time and location were determined via the identification from SKFC. In addition, the events (as well as the conduction of the surveys) became part of the ongoing safety initiative sponsored by SKFC.

Range and consistency checks were also utilized for measurements and questionnaire items. Both types of checks are useful and necessary to produce sound reasonable instruments. Range helps with identifying limitations for certain variables. Consideration were taken into account to determine the level of range that was needed based on the characteristics of the respondents. Consistency focuses on the reduction of error. Pretesting was considered to assist with the elimination of consistency issues and concerns. Through consistency checks and pretesting (evaluation of questionnaire wording and formation, answer techniques, question selection, respondent tendencies), error, reliability, and validity factors could be minimized (Babbie, 2004). However, due to time constraints (as well as the fact that the various portions of the survey were previously pre-tested and deemed valid/reliable), pre-testing of the compiled survey was not conducted. The elimination of this step may have played a major role in the design, acceptance, and completion rate of the surveys.

The survey included the following items: age group, restraint use type, and vehicle type, number of passengers, seating position, driver and child demographics (age, gender, and race), and previous knowledge regarding state and local occupant protection laws/regulations. Attention was placed on feasibility and validity issues as well as techniques to reduce response and interview bias.

Survey Instrumentation

In addition, the study utilized the Safe Kids Worldwide Child Passenger Safety Checklist (Appendix E) and a composite self-administered survey (Appendices B, C, and

D) that included aspects of SK Car Seat Safety Quiz, Injury Free Coalition for Kids-Atlanta (IFCK-Atlanta) Car Seat R_x form, Northside Hospital (Car Seat Safety Education Program) Pretest, and the US Department of Health & Human Services (National Cancer Institute) Planner's Guide: Making Health Communication Programs Work. In addition, assessment questions from the ATSDR Evaluation Primer on Health Risk Communications Programs and the Oak Ridge Institute for Science and Education (ORISE)-CDCyergy CD was utilized in order to evaluate current CPSS marketing techniques (Oak Ridge Institute for Science and Education., n.d.; Safe Kids Georgia, 2014; Safe Kids Worldwide, 2014a).

Safe Kids (SK) Worldwide is considered one of the leading resources for child-related unintentional injury education and prevention information. Safe Kids Worldwide prides itself on its mission statement: "protecting kids from the number one killer-unintentional injury" (National Safe Kids Campaign, 2019, para 1). Its mission statement along with its vision was developed through careful research and analysis of unintentional injuries and deaths to American children ages 14 and under. SK Worldwide is made up of more than 450 coalitions within 16 different countries whose clientele consists of educators, governmental organizations, public and private corporations/foundations, and volunteers (National Child Passenger Safety Certification, 2013; Safe Kids Worldwide, 2014a).

Safe Kids sponsors the National Child Passenger Safety (CPS) Certification Training Program. The training program is designed to educate, train, and certify injury

prevention specialist in child passenger safety. CPS technicians/instructors are involved in several educational efforts including CPSS check-up events (hands-on interactive CPSS installation demonstration and education), CPSS inspection stations (specified locations where parents/care givers could go to have their CPSS checked by a certified CPS technician/instructor), parent educational seminars, and National Child Passenger Safety Week (typically the second week in February) events (National Child Passenger Safety Certification, 2013).

The National CPS Certification Training Program utilizes a standard checklist that contains and documents information on CPSS use and misuse. This checklist (formally referred to as the Child Passenger Safety Checklist) includes data on (a) participant(s)' demographics (parent and child name, place of residence, contact information, and vehicle model/make information), (b) CPSS related information (make/model, how it arrived in vehicle-based on installation and use, seat type appropriateness for child, and misuse observed), (c) distribution of educational information, and (d) reference and resource sections. This checklist has been and continues to be utilized worldwide as a primary and reliable source/instrument for CPSS check-up events and inspection stations (National Child Passenger Safety Certification, 2013). In addition, the Child Passenger Safety Checklist has been tested and approved by the National Child Passenger Safety Board as well as recognized by the NHTSA (premier organization in traffic safety). The checklist has been referred to, utilized, and documented in a substantial amount of

research studies pertaining to child passenger safety, providing both reliability and validity evidence (National Child Passenger Safety Certification, 2013).

Injury Free Coalition for Kids is a national association of injury prevention centers. IFCK-Atlanta's mission is geared towards the prevention of injury to children. "The primary objective of Injury Free Atlanta is to reduce the number of injuries among our pediatric population. This objective is accomplished by the development and delivery of community and hospital-based injury prevention programs" (Injury Free Coalition for Kids, 2016, para 1). Injury Free Coalition for Kids-Atlanta provides safety education programs throughout the metropolitan-Atlanta area (Injury Free Coalition for Kids Atlanta, 2016).

Regarding motor vehicle and pedestrian safety, IFCK-Atlanta sponsor programs which include but are not limited to, seat belt safety, child passenger safety, CPSS check-up events, car seat training classes for parents and caregivers, bicycle rodeos, and safety health fairs. One of the main programs associated with Injury Free Coalition for Kids-Atlanta is the Buckle Up Faithfully program (car seat education and distribution program). One of the tools utilized in the program is the Car Seat R_x form. This form documents parents' demographical, child passenger safety knowledge, and CPSS use/non-use rationale information. This form has been approved by the Grady Health System, University of Georgia's School of Public Health Program, and the Georgia Traffic Injury Prevention Institute (GTIPI) (Injury Free Coalition for Kids Atlanta, 2016).

Northside Hospital is part of the Northside Healthcare Delivery System. This system is made up three hospitals and 15 outpatient centers located throughout the metropolitan Atlanta area (City of Atlanta, Forsyth County, and Cherokee County) (Northside Hospital, 2016). Currently, Northside provides pregnancy, child birth, and parenting classes. It also offered a Car Seat Safety course. This 3-hour course provided parents/soon-to-be parents with information on child passenger safety and instructions on how to properly secure a child safety seat (s). In addition, it allowed the class participants to gain hands on training with seat installation. In this course, Northside utilized a standard pretest that was given at the beginning of the class. The pretest was a 10-question survey that contained a range of topics including child passenger safety laws/regulations, difference in types of CPSS, proper placement of seat equipment, and proper usage of seats. The test was tested and approved by Northside Healthcare System in conjunction with the Georgia State Department of Public Health-Division of Injury Prevention (Northside Hospital, 2016).

The National Cancer Institute (NCI) is part of the National Institute of Health (NIH), which in turn is an agency established within the US Department of Health & Human Services - Public Health Services (PHS). NCI, established through the National Cancer Institute Act of 1937, is one of the primary agencies designed for the training and education of cancer. Holding true to its mission, NCI developed the National Cancer Program. This program manages a broad range of research, training, and information dissemination activities that reach across the entire country, meeting the needs of all

demographics—rich and poor, urban and rural, and all racial/ethnic populations" (National Institutes of Health, 2018, para 4). The program also provides cancer related such as and clinical trial and research which are geared towards the public (National Institutes of Health, n.d.).

The National Cancer Program (within NCI) published a health communication document in order to guide health communicators various aspects of health communication initiatives. The Planner's Guide: Making Health Communication Programs Work assists health communication specialists on techniques on how to develop, pretest, implement, and evaluate health communication products. Questions placed on the self-administered survey included product content information (type of health communication outlet, name of the product, sponsoring agency, product objectives, and primary and secondary intended audiences) as well as users' perception of these products (how they would classify themselves-parent, did the product influence the use of CPSS, was the product effective, and would they recommend the product to others). This document has been approved, published and deemed valid and reliable by the National Cancer Institute and the US Department of Health & Human Service (US Department of Health and Human Services, 2014).

Data collection guidelines from the AAA Foundation for Traffic Safety will be utilized to gather study participant information. The AAA Foundation for Traffic Safety, with the assistance of TransAnalytics, Inc., composed a guidebook for observing restraint use and misuse amongst motor vehicle occupants. The guidebook consisted of several

topics including targeted population groups, survey design and construction, sampling techniques, field equipment, methodology (moving traffic, controlled intersection, parked traffic with minimal interaction, parked traffic with high volume interaction, and parked traffic with high volume interaction and law enforcement), and data analysis. Within this guidebook is an explanation and example of the National Occupant Protection Use Survey. The National Occupant Protection Use Survey "provides the nation's only probability-based observed data on child restraint use on the nation's roads" (AAA Foundation for Traffic Safety, 2005; Glassbrenner, 2003, p. 2;).

Regarding obtaining marketing information, attempts were made for the utilization of the ATSDR Primer for Evaluating Health Risk Communication. ATSDR is a federal public health agency designed to prevent and reduce mortality/morbidity to the public due to environmentally-induced hazardous substances. The agency is a part of the United States Department of Health and Human Services, with headquarters located in Atlanta, Georgia (Agency for Toxic Substances and Disease Registry, 2016). In addition, ATSDR serves its community by advising the public of Superfund sites, identifying communities/populations that may have undergone hazardous exposures, recommending actions to reduce/eliminate environmental dangers, conducting health studies and funding environmental based research, educating the general public including health care providers on hazardous substances, and providing technical support and advice to other related agencies. In addition, they provide the community, health educators, health care providers, and other health professionals with community environmental health education

resources in order to increase environmental knowledge (Agency for Toxic Substances and Disease Registry, 2016).

The US Public Health Service (part of the US Department of Health and Human Services) holds a mission to develop effective health risk communication and evaluation strategies. As part of this mission, a report- Recommendations to Improve Health Risk Communication: A Report on Case Studies in Health Risk Communication was developed (Agency for Toxic Substances and Disease Registry, 1994; 2016). Within this report, it was noted that the current health communication evaluations tactics were not satisfactory. After the initial report was reviewed, the subcommittee later generated A Primer for Evaluating Health Risk Communication. The purpose of the primer was to provide health communication specialist and decision makers housed within PHS and other related agencies information on effective heath risk communication methods. These methods include health education materials design and development (topic to be communicated, how it should be communicated, and the desired audience for the product), product evaluation techniques (what is the expected impact/outcomes and how do you analyze the products effectiveness), as well as the Seven Cardinal Rules of Risk Communication (acceptance of the publics' role, plan and evaluate efforts, listen to the public concerns, be honest, maintain collaboration and partnerships, accept the concerns and wants of the media, and speak clearly so the audience could comprehend the provided information) (Agency for Toxic Substances and Disease Registry, 1994; 2016).

ATSDR Evaluation Primer on Health Risk Communication Programs provided assessment questions on assessing health communication efforts. Questions associated with this tool addressed issues related to the number of people reached (evaluating the marketing process). These questions included the number of PSAs developed, the number of billboard advertisements displayed, the various mass media outlets utilized (number and amount of air time played as well as thee estimated audience reached), and the number of CPSS educational materials produced (print coverage, estimated readership, and number distributed) for the three designated locations (Atlanta, Alpharetta, and College Park/East Point) (Agency for Toxic Substances and Disease Registry, 1994; 2016). In addition, communication objectives were measured. These goals examined the relationship and effectiveness of the various health communication products to the type of: a) information and education involved and b) behavior change and/or protection actions taken (Agency for Toxic Substances and Disease Registry, 1994; 2016).

The Oak Ridge Institute for Science and Education is on the fore front of designing and producing effective health communication products. ORISE achievements not only include heath communication efforts, but also training, safety research, and technology advancement. Their core skills involve a long range of activities ranging from communication need assessments and working with focus groups to staff development and creation of culturally sensitive products. ORISE proficiency is demonstrated through their affiliations with public communication, research-evaluation guidance, public health preparedness, outreach and promotions, and interactive web applications. Within the

realm of interactive web applications, ORISE has developed the CDCyergy CD (2001) (Oak Ridge Institute for Science and Education, n.d.).

CDCyergy was developed as a result from a partnership with the Center for Disease Control and Prevention (CDC) Office of Communications. The CDCyergy CD was designed to assist health communicators on how to successful construct health communications materials. The CD covered a variety of topics including social marketing and emergency risk communication. Each subject area was further broken down into six step-by-step educational phases. The CD also included examples of resource tools and additional references specific to the topic area (Oak Ridge Institute for Science and Education, n.d.).

Generated study data may have been biased or distorted due to the participation of limited events (to achieve survey information) (Agency for Toxic Substances and Disease Registry, 1994; 2016). Therefore, information from the non-participant observations (from the three road blocks) as well review from various secondary data sources was utilized.

Validity and Reliability Testing of the Survey

When developing surveys, it is necessary to inquire if the instrumentation is both valid and reliable. A valid instrument could refer to one that measures and produces its desired effects. There are several types of validity concern that should be considered and addressed when developing study instruments. These validity types include construct, convergent, content, representation, face, and criterion validity. It also encompasses

concurrent, predictive, statistical conclusion, internal, external, and ecological validity (National Business Research Institute, 2017).

Construct validity pertains to the degree to which a test item theoretically measures what it actually meant to measure. Convergent validity pertains to the theoretical extent to which items correlates to one another (as forecast). Content validity is the measure to which the questionnaire content is represented throughout all desired sample groups. Representation (translation) validity refers to the degree to which an abstract theoretical survey could be translated into a practical/usable instrument. Face validity is whether or not a specific test accurately measured a test item. Criterion validity involves measuring test items against other test items that were already proven to be valid. Concurrent validity encompasses the correlation of various test items that are used to measure the same construct (at the same time). Predictive validity encompasses the correlation of various test items that are used to measure the same construct (at the same time in the future). Statistical conclusion validity consists of the extent to which the conclusion of the variables' relationships is accurate. Internal validity (deductive reasoning) refers to the causal relationships between variables and test items. External validity pertains to the generalization of study findings. Ecological validity consists of the degree to which research findings and outcomes could be employed to real life occurrences (National Business Research Institute, 2017).

Although these validity factors exist, statistically there is not one test that could prove the validity of a constructed survey. "Generally, validity is based solely on the

judgment of the researcher. When an instrument is developed, each question is scrutinized and modified until the researcher is satisfied that it is an accurate measure of the desired construct, and that there is adequate coverage of each area to be investigated" (StatPac, 2017, para 19). However survey developers could validate their instruments by either forwarding the survey to a fellow researcher for validation, debugging the questionnaire (sending the document to a sample of participants/respondents for feedback and evaluation), and/or locating a respondent and allowing them to answer the drafted questions. The items that the respondent may have issues with (or questions on) could be considered a problem item and may need to be altered prior to final development (StatPac, 2017).

When an instrument is reliable, it means that it produced the same (or similar) results repeatedly (lacking random error). If a testing instrument is not valid, then it will also not be reliable. Survey reliability could be tested through various techniques including test-retest (serving the same test to the same individuals multiple times), equivalent form (developing two separate tests for the same test items/constructs, then measuring the degree of correlation), and/or internal consistency (split-half reliability: dividing the test into two separate portions and measuring the correlation between both portions) (StatPac, 2017).

In regard to this study, since the proposed survey took aspects from already pre-approved and tested instruments (from well-known and reputable sources/organizations) (refer to Survey Instrumentation section) and it did not utilize newly developed untested

question items, it was assumed that the study survey held aspects of validity and reliability. However, if deemed necessary, the survey could have been administered to a sample group for validity and reliability testing results.

Scale

Scaling is a technique utilized in social science which includes the investigation of attitudes/beliefs (via the development of a testing instrument) (Frankfort-Nachmias & Nachmias, 2008; Research Methods Knowledge Base, 2006). Scaling involves placing statements in a continuum fashion for responders to decide their level of agreement or disagreement. Scaling typically could be used to quantify qualitative measures or concepts. Scaling could be divided into two separate groups: unidimensional (for one distinct focus) and multidimensional (for multiple focuses or concepts). Unidimensional scaling is further segregated into Likert Scales (summative), Guttman Scales (cumulative), and Thurstone Scales (equal-appearing) (Frankfort-Nachmias & Nachmias, 2008; Research Methods Knowledge Base, 2006). Likert Scaling entail the incorporation of six main steps. These steps include assembling a list of possible items that could be used in the scale, dispensing the listed items to the selected respondents, and calculating an aggregate score (per respondent). Likert scaling also involves defining the descriptive power (DR); selecting scale items that possess the highest DR values; and testing the chosen scale (and its related items) for reliability and validity (Frankfort-Nachmias & Nachmias, 2008; Research Methods Knowledge Base, 2006).

The Guttman Scaling method was developed in 1940 by Louis Guttman. Guttman scaling includes the presence of an empirical test (for the reassurance of unidimensional characteristics). In addition, this method holds facets of cumulative features "in that information from any respondents' last positive response allows the researcher to predict all of that person's responses to the other items in the series" (Frankfort-Nachmias & Nachmias, 2008, p. 431). The cumulative feature also places test items in order of difficulty or intensity. Guttman Scaling requires the utilization of two main steps: determining the items for the scale and computing the coefficient of reproducibility (CR). The Guttman Scale utilizes the CR to determine the scale's conformity level. A CR value of .9 is used to determine if the scale is unidimensional (Frankfort-Nachmias & Nachmias, 2008; Research Methods Knowledge Base, 2006).

Validity and Reliability

Although utilizing a randomized systematic cross-sectional convenience sample may be beneficial for this particular study, the research design may however possess some limitations (Babbie, 2004; Creswell, 2003). For instance, cross-sectional designs sometimes do not assure relationships amongst factors/variables, validity issues may be present (response, preceptor/interview, and observation bias), reliability, and feasibility concerns may play a role (time, cost, participation availability, researcher expertise, and ethical issues).

Validity

Quantitative research involves the experimentation and evaluation of hypotheses (Babbie, 2004). Within quantitative research lie the issues of validity and reliability. This study (as well as with the design of study instrumentations) took into consideration validity and reliability concerns. Validity helps to determine if the results are accurate and credible. Internal validity is described as the phenomenon that explains the probability that the reached outcome was not fully determined by the actual performed intervention. Internal validity stems from several factors including historical events, maturation/changing of program subjects, testing (administrator, instrument, time, location), statistical regression, selection bias (accurately matching randomized/comparison groups), experimental mortality/loss to follow up, cause time order, diffusion of treatment (communication between research groups), compensation towards control group, and compensatory rivalry and demoralization amongst control group. Internal validly could have occurred and been associated with both experimental and survey designs.

External validity refers to the generalizing of the results to the entire overall population. For quantitative data, typically history, maturation, testing, statically regression, selection bias, and instrumentation validity are limited (Babbie, 2004). Limited data results could be due to the low number of the sample population as compared to the actual population group. This study focused on internal validity issues (including testing, instrumentation, statistical regression, and selection bias), external

validity (Solomon four-group design), and statistical conclusion (Babbie, 2004; Creswell, 2003).

Another type of validity issue is the presence of biases (e.g., response, preceptor/interview, and observation) (Laureate Education, 2010). Response bias is any bias that may be associated with the respondent (person providing information/answers to the administered survey). Response bias could have occurred and have been caused by any number of factors including question selection (open-ended/closed-ended, unclear, double-barreled, or irrelevant questions), question formation (contingency/, matrix questions, and order/instructions pertaining to specific questions), incompetent or unwilling respondents, negative or long question items, pretesting of survey items, administration techniques (self-administered, interview, telephone, or computerized) (Laureate Education, 2010).

Interview limitations could have also occurred. Preceptor/interview bias may entail the interviewer's use of complicated and ambiguous information and instructions pertaining to the interview (and the process). The interviewer may not be aware of possible cues that may mislead the respondents (ex: the method the questions are formatted or worded). These cues could be misinterpreted by the respondent and could be considered confusing or biased (Laureate Education, 2010). In addition, the interviewer may hold their own individual unconscious biases that may influence their interpretation of the results. (Laureate Education, 2010).

In addition, observation bias may have taken place. Observational bias may include the fact that the researcher may hold their own beliefs and views of the incidences being observed and may possibly note their own views as oppose to the true essence or meaning of the observed actions. The participant may display bias by acting or behavior in a manner that they believe is desirable to the observer/researcher. This behavior may not be an accurate account of their normal behavior (Thomas, Nelson, & Silverman, n.d.). Other facets could include the interviewer's appearance and behavior, acquaintance with the survey, and the precise noting of the questions and responses (Babbie, 2004).

Biases were tested through the evaluation of validity issues as well as process and formative evaluation methods (Babbie, 2004). In addition, randomization (systematic), pretesting, and performance assessments were maintained. Other validity issues that were contemplated were the vagueness about the direction of causal influence and the insufficiency of the definitions (variables) (Babbie, 2004).

Considerations were made to decrease biases from occurring (Research Design Review, 2012). One method was using trained, experienced preceptors/interviewers, data collectors, and evaluators. In addition, reflexivity was used. Reflexivity aids with understanding "the interviewer's role in the interview context and how to use this knowledge to enhance the trustworthiness, transparency, and accountability of their research" (Research Design Review, 2012, para 2). Also, this method assisted the

interviewer to phrase the questions in a more appropriate manner that the respondent could better comprehend.

Special consideration was also be placed on the evaluation of outliners and influential points. Both outliners and influential points provide necessary and valid information regarding the data sets/variables. For the most part, outliners are easier to visually detect than influential points (based on the data plotted on the scattered diagram-point horizontally furthest away from others). Although visually, it may be easier to detect outliners, it still may be necessary to test for its true existence within the given data sets. In order to test for the presence of either outliners and/or influential points, one should recalculate and re-plot the data. The data sets should not include the figure in question, therefore indicating the relationship of the omitted data to the remaining points (Triola, 2004).

Reliability

Reliability is "how consistent the results are when the experiment is repeated a number of times under same methodological conditions" (UKEssays, 2014, para 2). Reliability also focuses on creating similar outcomes via similar situations, the solidity of the investigation, and the resemblance of the data within a certain aspect of time. High solidity/stability equates to high repeatability, which in turns equates to high reliability (UKEssays, 2014).

Cronbach's Alpha

As previously stated, when developing instruments, validity and reliability concerns should be taken into account. Regarding this study, the Cronbach's alpha was calculated. The Cronbach's alpha is a measurement that is used to determine internal consistency (the relationship) between question items (for unidimensional scales) (Laerd Statistics, 2013). These question items could be either dichotomous questions with two possible answer choices or multi-point questions with scales. Cronbach's alpha evaluates the results between the items and the total sum of the measured items (producing a coefficient of inter-item correlations) (Journal of Extension, 1999; Laerd Statistics, 2013).

The Cronbach's alpha also helps with validating reliability issues and concerns as well as evaluates the results between the items and the total sum of the measured items (producing a coefficient of inter-item correlations) (Field, 2013; Journal of Extension, 1999). The alpha value typically ranges from 0 and 1. A strong relationship is equivalent to a high internal consistency. Therefore, the greater the value the greater the likelihood of a reliable product) (ex: Cronbach's alpha coefficient = .8). Although a score of .8 is deemed significant, in research a score of .7 is also considered acceptable (but lower scores have also been recognized and accepted) (Field, 2013; Journal of Extension, 1999).

Although test results may produce a high alpha value, it does not guarantee that the test is unidimensional (Institute for Digital Research and Education, 2015).

“Cronbach's alpha can be written as a function of the number of test items and the average inter-correlation among the items” (Institute for Digital Research and Education, 2015, para 2). Attention was also noted that although the scale may have been determined to be homogenous, this fact could have been inaccurately achieved due to the doubling or addition of test items (as opposed to the true correlation between items). If the alpha value is too large, it could be assumed that there exists a large level of redundancy in the test items. Cronbach's alpha is typically utilized for multi-item scales (surveys with multiple questions) as well as surveys (via Likert scales) which focus on attitudes and beliefs (Field, 2013; Journal of Extension, 1999; Laerd Statistics, 2013).

Underlying Assumptions of Cronbach’s Alpha

When performing a statistical analysis, many assumptions should be taken into account (Field, 2013). Assumptions are “conditions that ensure that what the researcher is attempting to do works” (Field, 2013, p. 165). Assumptions are a set of factors that are presumed to be put in place and operating properly to achieve valid and statistically acceptable results. When the assumptions are breached or falsified, analysis error may occur. When calculating Cronbach’s alpha, certain assumptions could exist. These assumptions include that the performed test would reduce the chance/presence of measurement error (which is poorly associated with the accurate score); the measurement error would produce a mean value of zero (measurement error values should be uncorrelated and random), and there should be a sound relationship between the true achieved score and the observed score. “It is also assumed that items must be essentially

tau equivalent, in which the true scores for any two items must be within a constant of each other for an exam. If this assumption for Cronbach's alpha is violated, alpha may underestimate reliability. For this reason, it is generally agreed that Cronbach's alpha is a lower bound estimate of reliability because perfect essentially tau-equivalence is seldom achieved" (Yu, n.d., p. 1). If these assumptions are violated, estimation errors (over-estimation and under-estimation) as well as scaling misinterpretations could occur (Yu, n.d.).

Feasibility

As previously stated, potential challenges in conducting this study may have existed. These barriers included feasibility issues and concerns. These concerns could have stemmed from availability of resources (financial and human), conducting an adequate needs assessment of the issue at hand, training of workers/educators, developing, implementing, and evaluating a successful campaign, testing health materials (due to time and financial constraints), disseminating developed information to a variety of groups and populations (due to financial and accessibility constraints), and adapting and analyzing current social media techniques. Feasibility was referred to the capability of the investigator to perform the indicated study. Regarding the study at hand, certain feasibility issues stood out (Simon, 2011).

These issues included:

- Time: This study was a cross sectional investigation of program participants within Fulton County, Georgia. Even though the data collection process was

scheduled for a 3-month period, study participants were involved for no longer than a 1-hour period (based on the time it took to complete the self-administered survey and CPSS observation).

- Cost: There was limited cost associated with the study. Volunteers were used as data collectors and study participants (drawn from a self-selection pool). In addition, because the study was held in conjunction with other planned sponsored safety events, there was no study cost accrued. The only anticipate cost associated with the study was the printing and duplication of the surveys as well as the cost associated with data analysis and evaluation.
- Participant availability: As previously stated, participants were recruited based on a volunteer basis. They were self-selected filtered through sponsored CPSS event locations. Participants were involved for no longer than a 1-hour period (based on the time it took to complete the self-administered survey and CPSS observation).
- Researcher expertise: I have a vast amount of experience and expertise in this subject matter. I work in the field of unintentional injury (including motor vehicle related issues) for over twenty years and possesses a vast amount of knowledge regarding childhood motor vehicle and pedestrian issues and concerns. Due to the ample amount of time in this field, I have acquired a passion and love for reducing deaths and injuries caused to children. In addition, I am a Certified Child Passenger Safety Instructor and have been a member of Safe Kids Worldwide and Injury Free Coalition for Kids for over 20 years. Both SK and IFCK are

organizations designed to reduce unintentional injuries and deaths to children ages 0-17.

- Ethical concerns: The study was deemed ethical and safe. This assumption was made since there was no experimentation involved as well as the self-selection of study participants. In addition, all study-related consent/assent forms were distributed, signed/completed, and collected and the study has undergone the necessary steps associated with Walden University's Institutional Review Board (IRB) process.

Ethical Issues

Ethical Considerations

Ethical issues were considered when conducting a study. A study could induce possible harm to human subjects by intentionally or unintentionally releasing confidential information (developing into participant discomfort). To address these concerns, ethical protocols were implemented. These protocols permitted the participants the chance to disconnect themselves from the study if they experience any level of anxiety or hurt. The participants were also extended counseling assistance (if needed). All study information remained isolated and secure (in a locked file cabinet), only permitting access to those involved in the implementation and evaluation of the study (Sci.Nova.edu, n.d.; Walden University, 2014a; 2014c). In addition, study personnel (if deemed necessary) was provided the opportunity to sign and submit a Confidentiality Agreement to help ensure the non-disclosure of confidential information. Data disposal will occur once all data has

been assessed/evaluated and all results have been disseminated to the appropriate parties involved.

Also, the study constructed and disseminated consent forms (for adult participants) (Appendix F). The forms comprised of information of the overall study; potential risks, benefits and financial obligations; confidentiality, participation obligations (including volunteer standing and ability to withdraw from the study), and the likelihood of obtaining new research findings. The study implemented an Institutional Review Board (IRB) process. This procedure entailed a team of reviews who would assess the proposed study to ensure and defend the rights and investigation of human subjects. The study approval number was 11-20-17-0091354 (via Walden University's IRB review process). IRB assist "to ensure that researchers adhere to basic ethical principles underlying the acceptable conduct of research involving human subjects" (Nova Southeastern University, 2019a, para 2). "IRB is responsible for determining and assuring that a) the welfare and rights of human subjects are adequately protected and informed consent given, if necessary; b) human subjects are not placed at unreasonable physical, mental, or emotional risk as a result of the research; and c) the necessity and importance of the research outweighs the risks to the subjects" (Nova Southeastern University, 2019b, para 2).

Treatment of Human Subjects

Due to the nature of the study, precautions were taken to protect all involved (researcher and study contributors, University, and all intended participants). Per federal

regulations, all research should go through IRB approval to guarantee protection as well as the rights and welfare for both human and animal subjects (to eliminate or reduce the probability of any immoral research procedures). IRB should review potential studies that involves "medical and administrative record data, research that uses leftover tissues, health services research, survey research, behavioral research, and biomedical and other clinical research" (New Hanover Regional Medical Center, 2019, para 2)

Walden University's IRB process should protect the researcher, the University, and the intended population (parents/caregivers) by following certain guidelines and principles. These principles include respect for persons (participants are fully informed about the right to willingly participate as well as guaranteeing their right for privacy), beneficence (minimization of risk), and justice (equal dispersal of perceived threats and benefits) (New Hanover Regional Medical Center, n.d.; Walden University, 2014a; 2014c).

In regard to the research study, while unlikely, it was possible that participants may have be exposed to information shared by someone else that may cause some psychological discomfort. Discomfort may have occurred while answering questions or participating in non-participant observations. If this would have occurred, participants would have been dismissed from the survey. Participants were encouraged to report any unusual concerns or effects even if they were mild and not bothersome.

Any information obtained from participants during this study was kept confidential to the extent allowed by law. Only those involved in the research and

analysis of the study had access to the information and participants' name were not identified in any way with any information, or in any publication or report made about this program. Application was made to the Walden University Institutional Review Board. This board had access to any records should they request a review. Breaches of this confidentiality by any program staff were tolerated (New Hanover Regional Medical Center, n.d.; Sci.Nova.edu., n.d., Walden University, 2014a; 2014c).

It was highly unlikely that any participants would experience an injury as a direct consequence of his/her participation in this study. If this would had occurred and the participant suffered a study-related injury, he/she should have notified all contact persons associated with the research study (New Hanover Regional Medical Center, n.d.; Walden University, 2014c).

As an additional precaution, the study underwent Walden University's IRB process. This process is designed to adhere to federal regulations regarding the use and protection of human subjects within a study. As a direct result of the IRB process, participant consent forms were constructed, distributed, and collected. Careful considerations were taken in account for the design and analysis of the study, the risks and benefits associated with the study, and the opportunity for study participants to withdraw from the study (Hutton, 2001). Considerations were also taken into account for the interaction(s) with study participants, analysis and management of the data, interpretation of the results, and dissemination of the findings (Sci.Nova.edu., n.d.). All activities that were conducted in the study were provided free of charge. Participation in

the study was strictly voluntary and members had the option to decide not to participate or to withdraw participation at any time (New Hanover Regional Medical Center, n.d.; Walden University, 2014a; 2014c). In addition, data disposal will occur once all data has been assessed/evaluated and all results has been disseminated to the appropriate parties involved.

Summary

This chapter provided a brief summary on child passenger safety issues included an introduction of the study (background, problem statement, theoretical framework, definitions, scope/limitations, and significance), literature review of the problem at hand (historical context, national and local facts, marketing/advertising strategies, occupant protection surveillance systems, and social systems), and information on the design and methodology of the research (population/sampling, instrumentations, variables, data collection and analysis procedures, and validity, feasibility, and ethical issues). All of the provided sections supplied justification for stronger child passenger safety initiatives; particularly programs centered on the enhancement of CPSS knowledge amongst users, successful occupant protection marketing techniques, and the overall increase of proper CPSS use. The upcoming chapter supplies an explanation, review, and analysis of the study's hypotheses and collected data (including resulting tables and figures).

Chapter 4: Results and Analysis

In Chapter 4 of this dissertation, I examine the results of the cross-sectional, quantitative study. This examination includes presenting information on the study's descriptive data as well as hypotheses testing. Descriptive data entailed frequency measures for several variable predictors (survey item questions) including child ride; child sit, own CPSS; use CPSS, often use CPSS; type of CPSS; properly use CPSS; not use CPSS; advertising; GA Law; prevent CPSS use; resources; resources available; favor penalties and license suspension; government agencies, solutions, government programs, and programs available; and all 11 items of the pretest. Hypotheses testing included information relevant to underlying assumptions of the statistical test (as it relates to the study) and data outputs/results of the study. I present related tables and figures as well as report findings (via performance of regression linear model analysis).

Descriptive Data

I expected to reach approximately 120 participants with at least 81-90 who successful completed the project. These numbers (81-90) included the loss of approval by study participants and/or the non-presence of an authorized parent/guardian. The sample amount was chosen by the rationale that there should be a minimum of 30 participants per studied independent variable (30 x 3 = 90). Therefore, there was a minimum of 30 participants reached per study site: 3 sites x 30 participants = a minimum of 90 total study participants (Laerd Statistics, 2012c). The intended participants included adults (parents of children who are 8-years-old and younger).

However, the study survey was distributed to only 93 participants, of which 71 surveys (76.34%) were received/submitted for evaluation. Not every survey was completed in full, and a number of participants did not answer an assortment of questions. This could be attributed to the length of the survey as well as the time and location the surveys were administered. Therefore, there was a range in frequencies and *N* totals for a number of the tabulations/analysis. The *N* total was 36 (50.70% of the received surveys). In addition, many of the survey participants had multiple children as well as CPSS; therefore, they based/provided their answers on the total number of children/CPSS currently present in their household (Table 1). This small *N* total was problematic in various areas (including proving statistical significance and study generalization). In addition, the small sample size could have affected the statistical power and played a role in the standard error received (producing lower power results).

Table 1

Frequency: Child Age (Indicates number and ages of children utilized in study)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	2	.8	1.7	1.7
	0-1	28	11.3	23.7	25.4
	1-4	34	13.7	28.8	54.2
	4-8	26	10.5	22.0	76.3
	9-13	13	5.2	11.0	87.3
	14-17	3	1.2	2.5	89.8
	18-21	4	1.6	3.4	93.2
	22+	1	.4	.8	94.1
	Expectant parent	7	2.8	5.9	100.0
	Total	118	47.6	100.0	
Missing	System	130	52.4		
Total		248	100.0		

Test of Hypotheses

This analysis was designed to analyze how the independent variables (CPSS installation techniques, CPSS laws/regulations, and CPSS marketing strategies) related to the dependent variable (parents' use of CPSS). There was a total of 71 study participants

Underlying Assumptions of Statistical Test

When performing statistical analyses, assumptions should be considered. Assumptions are "conditions that ensure that what the researcher is attempting to do works" (Field, 2013, p. 165). Assumptions are a set of factors that are presumed to be put

in place and operating properly to achieve valid and statistically acceptable results. When the assumptions are breached or falsified, analysis error may occur. Because the test performed was a multiple regression analysis (with aspects of a general linear model design), it could be presumed that the assumptions were met. This presumption also held true because the multiple regression was conducted via a linear model, the dependent variable was continuous (parents' use of CPSS), the independent variables was made up of two or more groups (CPSS installation techniques, CPSS laws/regulations, and CPSS marketing strategies), the variances were homogeneous in nature, and the data sets were independent. The Dublin-Watson value for the overall study was 1.516 (close to 2). Therefore, it could be determined that the assumption of independent errors was valid (Field, 2013)

The scatter plot (Figure 1) showed that, although there were varied areas/sections on the plot where the dots were aligned close together (grouped together), the groups of dots were randomly scattered. Therefore, it could be determined that the assumptions of linearity and homoscedasticity may be valid. The histogram displayed a bell shape, therefore determining that the distribution was normal. In addition, although the P-P plot showed minimal deviations from the diagonal line, it could still be determined that the distributions may have been normal (Field, 2013; IBM SPSS Statistics Standard GradPack, n.d.)

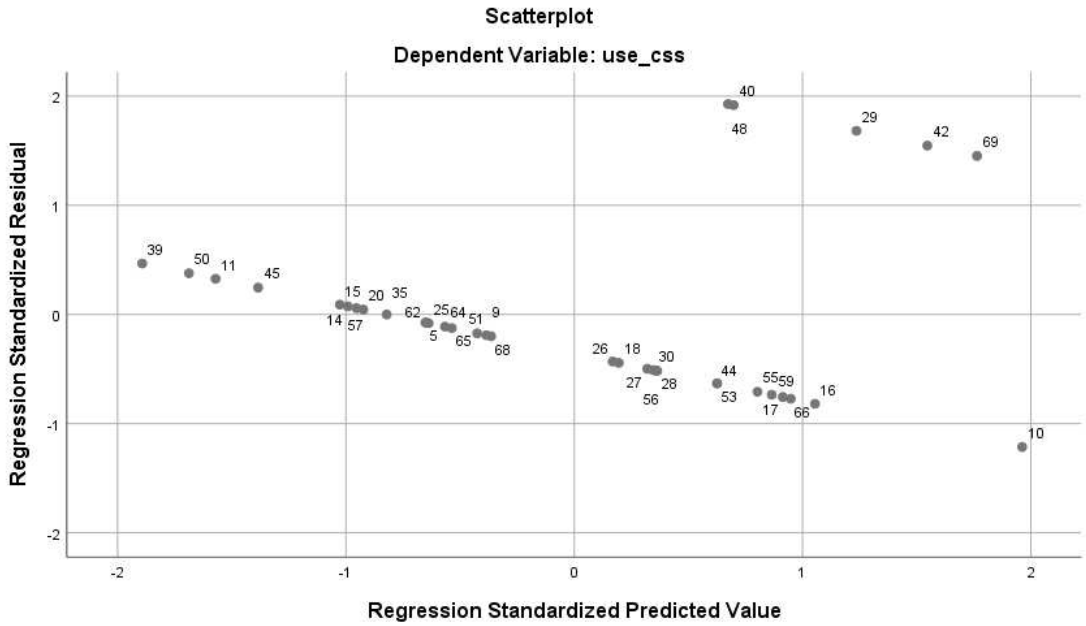


Figure 1

Scatterplot: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11).

Although the Pearson's correlation results (Tables 2-4) showed relatively small values (most of the variables held a negative value) and it could be assumed that there exists no collinearity (and the assumption of multicollinearity holds true), the collinearity diagnostics results displayed that CPSS installation techniques predictors (child riding in back and convertible seats) had most of its variance loaded on dimension 13 (.74 and .75 respectively). Although these figures were fairly high, they were less than the .95 level. Therefore, it could be determined that the assumption of multicollinearity may not have been violated (Field, 2013; IBM SPSS Statistics Standard GradPack, n.d.).

Table 2

Correlation: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Use_ css	Advert ising	Ga_css_ law	Child_ride _back	Convertible_ seats	Infant_ seat_airbag
Pearson Correlation	Use_css	1.000	-.157	-.019	-.050	-.011	-.068
	Advertising	-.157	1.000	-.096	.273	.307	.011
	Ga_css_law	-.019	-.096	1.000	-.023	-.013	-.041
	Child_ride_back	-.050	.273	-.023	1.000	.954	-.010
	Convertible_seats	-.011	.307	-.013	.954	1.000	-.119
	Infant_seat_airbag	-.068	.011	-.041	-.010	-.119	1.000
	Safest_palce	.014	.331	-.176	.087	.158	-.200
	Safest_practice	-.097	-.122	-.058	-.014	-.007	-.041
	Ga_law_posttest	-.048	.000	.305	-.148	-.153	-.101
	Latch_system	-.320	.147	.192	-.162	-.197	-.135
	Infants_ride_post	.014	.044	.135	.109	.103	.147
	Public_service_of f_trained	-.142	.073	-.085	-.080	-.040	-.060
	Harness_clip	-.238	-.158	.188	-.018	-.035	-.053
	Infant_seats	.143	.009	.386	-.430	-.423	-.023
Sig. (1-tailed)	Use_css	.	.180	.455	.385	.474	.347
	Advertising	.180	.	.288	.054	.034	.475
	Ga_css_law	.455	.288	.	.447	.470	.407
	Child_ride_back	.385	.054	.447	.	.000	.478
	Convertible_seats	.474	.034	.470	.000	.	.244
	Infant_seat_airbag	.347	.475	.407	.478	.244	.
	Safest_palce	.469	.024	.152	.308	.179	.121
	Safest_practice	.286	.238	.367	.468	.484	.406
	Ga_law_posttest	.390	.500	.035	.195	.187	.278
	Latch_system	.028	.195	.131	.172	.125	.216
	Infants_ride_post	.468	.400	.216	.264	.274	.196
	Public_service_of f_trained	.204	.337	.311	.320	.408	.365
	Harness_clip	.081	.179	.136	.459	.419	.380
	Infant_seats	.202	.480	.010	.004	.005	.447

Table 3

Correlation: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Safest_ palce	Safest_ practice	Ga_law_ posttest	Latch_ system	Infants_ ride_ posttest	Public_ service_ off_traind
Pearson Correlation	Use_css	.014	-.097	-.048	-.320	.014	-.142
	Advertising	.331	-.122	.000	.147	.044	.073
	Ga_css_law	-.176	-.058	.305	.192	.135	-.085
	Child_ride_back	.087	-.014	-.148	-.162	.109	-.080
	Convertible_seat	.158	-.007	-.153	-.197	.103	-.040
	Infant_seat_airbg	-.200	-.041	-.101	-.135	.147	-.060
	Safest_palce	1.000	-.287	-.034	-.019	-.147	.120
	Safest_practice	-.287	1.000	-.146	.055	-.042	.300
	Ga_law_posttest	-.034	-.146	1.000	.137	.035	.000
	Latch_system	-.019	.055	.137	1.000	-.198	.443
	Infants_ride_post	-.147	-.042	.035	-.198	1.000	-.431
	Public_service_o ff_trained	.120	.300	.000	.443	-.431	1.000
	Harness_clip	.185	.095	.094	.071	-.299	.262
	Infant_seats	-.023	-.033	.165	.031	-.096	-.049
Sig. (1-tailed)	Use_css	.469	.286	.390	.028	.468	.204
	Advertising	.024	.238	.500	.195	.400	.337
	Ga_css_law	.152	.367	.035	.131	.216	.311
	Child_ride_back	.308	.468	.195	.172	.264	.320
	Convertible_seat	.179	.484	.187	.125	.274	.408
	Infant_seat_airbg	.121	.406	.278	.216	.196	.365
	Safest_palce	.	.045	.422	.456	.196	.244
	Safest_practice	.045	.	.199	.374	.403	.038
	Ga_law_posttest	.422	.199	.	.213	.420	.500
	Latch_system	.456	.374	.213	.	.123	.003
	Infants_ride_post	.196	.403	.420	.123	.	.004
	Public_service_o ff_trained	.244	.038	.500	.003	.004	.
	Harness_clip	.140	.291	.293	.340	.038	.061
	Infant_seats	.447	.424	.168	.428	.289	.389

Table 4

Correlation: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Harness_clip	Infant_seats
Pearson Correlation	Use_css	-.238	.143
	Advertising	-.158	.009
	Ga_css_law	.188	.386
	Child_ride_back	-.018	-.430
	Convertible_seats	-.035	-.423
	Infant_seat_airbag	-.053	-.023
	Safest_palce	.185	-.023
	Safest_practice	.095	-.033
	Ga_law_posttest	.094	.165
	Latch_system	.071	.031
	Infants_ride_posttest	-.299	-.096
	Public_service_off_trained	.262	-.049
	Harness_clip	1.000	-.043
	Infant_seats	-.043	1.000
Sig. (1-tailed)	Use_css	.081	.202
	Advertising	.179	.480
	Ga_css_law	.136	.010
	Child_ride_back	.459	.004
	Convertible_seats	.419	.005
	Infant_seat_airbag	.380	.447
	Safest_palce	.140	.447
	Safest_practice	.291	.424
	Ga_law_posttest	.293	.168
	Latch_system	.340	.428
	Infants_ride_posttest	.038	.289
	Public_service_off_trained	.061	.389
	Harness_clip	.	.402
	Infant_seats	.402	.

The avoidance of assumptions could be a difficult task to perform (Field, 2013). It could stem from the presence of biases or the violations of assumptions. When considering bias, certain factors should be taken into account (Field, 2013). These factors

include the number of cases the model may have been influenced by (eg., a small amount) as well as if the model is generalizable. The small amount of cases could be influenced by outliers and influential cases. Outliers are data results that may be different or unusual in nature (compared to other obtain results). Outliers could be determined by evaluating the differences between "the data values that were collected and the values predicted by the model" (Field, 2013, p. 305). If the acquired value (residual) is large, then it could be determined that outliers were present. However, the determined residual may be considered normal or unstandardized (only interpreted for measures within the same units). To interpret measures across units/models, the residuals should be standardized "converted to z scores or into standard deviation units" (Field, 2013, p. 306). For this study, the residuals were fairly low. Therefore, it could be determined that outliers may not have been present. Influential cases help to assess if the removal of said cases would yield different regression coefficients. Influential cases could be determined by the use of adjusted predicted values (eg., deleted residual and Cook's distance); leverage (relates the observe value with the predicted value) (eg., Mahalanobis distances and DFBeta); and covariance ratio (CVR) that looks at influence of variances on the regression parameters (Field, 2013).

The model is considered to be generalizable if the results could be used outside of the tested sample (Field, 2013). Generalizability can be determined if all assumptions are met. Generalization could be tested via cross-validation. Cross-validation includes investigating if the achieved results (via the model) could be reached over different

samples. This process entails using an ample sample size to collect sufficient data and constructing a dependable regression model. It also entails conducting adjusted R2 and data splitting. If the model was determined not to be generalizable, then any conclusion drawn from the test would be subjected only to the sample used (and not the over general population; Field, 2013). Due to the limited sample size and study type (cross-sectional study), it would be difficult to assume that the study is generalizable.

The violation of assumptions could lead to analysis error or statistically invalid results (Field, 2013). The violations could also influence significance tests and confidence intervals. If the confidence intervals are erroneous, it could become difficult to determine the population value (thus making the model ungeneralizable; Field, 2013). In addition, if the relationship displayed in the scatterplots and partial regression plots was determined to be nonlinear, either a nonlinear regression analysis could be conducted or the achieved data could be transformed (via SPSS Statistics) to assist with validating a linear relationship (Laerd Statistics, 2013).

Research Question 1

What was the correlation between parents' knowledge/understanding of proper CPSS installation techniques and parents' use of CPSS?

$H_0$1: There was no correlation between parents' knowledge/understanding of proper CPSS installation techniques and parents' use of CPSS.

$H_1$1: There was a statistically significant correlation between parents' knowledge/understanding of proper CPS installation techniques and parents' use of CPSS.

Research Question 2

What was the correlation between parents' knowledge/understanding of CPS laws and regulations (policies and enforcement strategies) and parents' use of CPSS?

$H_0$2: There was no correlation between parents' knowledge/understanding of CPS laws and regulations (policies and enforcement strategies) and parents' use of CPSS.

$H_1$2: There was a statistically significant correlation between parents' knowledge/understanding of CPS laws and regulations (policies and enforcement strategies) and parents' use of CPSS.

Research Question 3

What was the correlation between parents' knowledge/understanding of CPS marketing strategies and parents' use of CPSS?

$H_0$3: There was no relationship between parents' knowledge/understanding of CPS marketing strategies and parents' use of CPSS.

$H_1$3: There was a statistically significant correlation between parents' knowledge/understanding of CPS marketing strategies and parents' use of CPSS.

Results and Analysis

Several analyses were performed for this study. These analyses included cross tabulations between various predicators of variables (survey question items) including

own CPSS and use CPSS, use CPSS and not use CPSS, resources and resources available, and community programs and programs available. In addition, several linear regression analyses were performed to evaluate the difference (if any) in study results. As with the cross tabulations, the regression analysis included the predicators of variables (survey question items). The regressions performed included GA law, advertising, and child sit with use CPSS; advertising sources (five survey question items related to advertising) with use CPSS; GA law sources (four survey question items related to GA law) with use CPSS; installation techniques (11 question pretest related to installation techniques and CPSS knowledge) with use CPSS; advertising sources, GA law sources, and installation techniques with use CPSS; GA law with use CPSS, advertising with use CPSS; and installation techniques with use CPSS. However, due to the abundance of information (and long length of the report) as well as the similarities in data results, only one set of analysis (regression analysis for advertising, GA law, installation techniques with use CPSS) will be discussed in this chapter. A full list of SPSS syntax and output tables/figures could be provided upon request (Appendix G).

Reporting Results

The descriptive statistics table (Table 5) displays the mean and standard deviation for each study predictor. The average mean for the various predictors were as follows: use CPSS (1.139), advertising (1.889), GA law (1.750), child ride back (3.167), convertible seats (3.083), infant seat airbag (1.028), safest place (2.583), safest practice

(1.056), Ga law pre/posttest (1.500), latch system (1.389), infant ride pre/posttest (2.167), public service official trained (1.111), harness clip (2.2222), and infant seats (2.056).

Table 5

Descriptive Statistics: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

	Mean	Std. Deviation	N
Use_css	1.1389	.35074	36
Advertising	1.8889	1.78530	36
Ga_css_law	1.7500	3.15663	36
Child_ride_back	3.1667	2.97129	36
Convertible_seats	3.0833	2.98927	36
Infant_seat_airbag	1.0278	.16667	36
Safest_palce	2.5833	.50000	36
Safest_practice	1.0556	.23231	36
Ga_law_posttest	1.5000	.84515	36
Latch_system	1.3889	.49441	36
Infants_ride_posttest	2.1667	.97101	36
Public_service_off_trained	1.1111	.31873	36
Harness_clip	2.2222	.72155	36
Infant_seats	2.0556	.41019	36

As previously discussed, the correlations tables (Tables 2-4) displayed the Pearson's correlation coefficient, the one-tailed significance, and the number of cases contributing to each correlation (between each pair of predictors; *N*= 36). The diagonal of the matrix showed a value of 1. This diagonal was due to each predictor being compared to itself, therefore producing values of 1. The Pearson's correlation showed how each tested variable (predictors/survey items that help identify the independent variables)

correlated with the other provided/tested variables. In addition, it showed how each tested variable correlated with the outcome (dependent variable-use CPSS). In many of the instances, the Pearson's correlation values were negative (but between 1 and +1). The closer the correlation value is to +/-1, the closer to a perfect linear relationship. Therefore, it showed that correlations existed between these variables, although the correlations may have been negative. A negative correlation may infer that as one of the variables increased, the other variable followed suit in a negative/opposite fashion (decreased). Similarly, as one variable decreased, the other may have increased. In regards to the outcome (use CPSS), the Pearson's correlation values were -.157 (advertising), -.019 (GA law), -.050 (child ride back), -.011 (convertible seats), -.068 (infant seat airbag), .014 (safest place), -.097 (safest practice), -.048 (Ga law pre/posttest), -.320 (latch system), .014 (infant ride pre/posttest), -.142 (public service official trained), -.238 (harness clip), and .143 (infant seats). Because infant seats had the greatest Pearson's correlation value (.143), it could be determined that infant seats best predicted CPSS use.

The one-tailed analysis was used to test the indicated hypotheses. In order to reject the null hypotheses, the *p*-values should be below 5% (5% or 0.05). Because the majority of the *p*-values were greater than 5%, the null hypotheses cannot be rejected (possibly due to the small sample size). The only predictor that had a *p*-value lower than 5% was latch system. However, because this just one predictor for the independent variable (CPSS installation techniques), the null hypotheses still held true. The

correlations table also helped to determine if the assumption of multicollinearity existed. Field (2013) stated, "If there is no multicollinearity in the data then there should be no substantial correlations (r> .9) between predictors" (p. 335). Because all of the predictors' values were less than .9, it could be assumed that there existed no collinearity (and the assumption of multicollinearity held true; IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013).

Although the null hypotheses were true (therefore yielding nonsignificant results), the study could still possibly prove to be clinically significant. Clinical significance is determined by calculating the Q values. American College of Physicians (2014) stated, "The purpose in proposing Q values is to provide a general method for quantifying the probability of a clinically worthwhile effect when the minimum worthwhile effect lies within the CI. Determining *Q* values follows three steps" (para 1). *Q* values could be predicted in a similar manner as *p*-values. However, the *Q* values may determine the minimum effect value (instead of no effect at all). In addition, *Q* values are typically one-sided probabilities (to help determine or assess the effectiveness of an intervention (American College of Physicians, 2014). Although I reviewed the *p*-values (and not *Q*), future research may want to investigate the worthiness of similar programs.

Table 2

Correlation: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Use_ css	Advert ising	Ga_css_ law	Child_ride _back	Convertible_ seats	Infant_ seat_airbag
Pearson Correlation	Use_css	1.000	-.157	-.019	-.050	-.011	-.068
	Advertising	-.157	1.000	-.096	.273	.307	.011
	Ga_css_law	-.019	-.096	1.000	-.023	-.013	-.041
	Child_ride_back	-.050	.273	-.023	1.000	.954	-.010
	Convertible_seats	-.011	.307	-.013	.954	1.000	-.119
	Infant_seat_airbag	-.068	.011	-.041	-.010	-.119	1.000
	Safest_palce	.014	.331	-.176	.087	.158	-.200
	Safest_practice	-.097	-.122	-.058	-.014	-.007	-.041
	Ga_law_posttest	-.048	.000	.305	-.148	-.153	-.101
	Latch_system	-.320	.147	.192	-.162	-.197	-.135
	Infants_ride_post	.014	.044	.135	.109	.103	.147
	Public_service_of f_trained	-.142	.073	-.085	-.080	-.040	-.060
	Harness_clip	-.238	-.158	.188	-.018	-.035	-.053
	Infant_seats	.143	.009	.386	-.430	-.423	-.023
Sig. (1-tailed)	Use_css	.	.180	.455	.385	.474	.347
	Advertising	.180	.	.288	.054	.034	.475
	Ga_css_law	.455	.288	.	.447	.470	.407
	Child_ride_back	.385	.054	.447	.	.000	.478
	Convertible_seats	.474	.034	.470	.000	.	.244
	Infant_seat_airbag	.347	.475	.407	.478	.244	.
	Safest_palce	.469	.024	.152	.308	.179	.121
	Safest_practice	.286	.238	.367	.468	.484	.406
	Ga_law_posttest	.390	.500	.035	.195	.187	.278
	Latch_system	.028	.195	.131	.172	.125	.216
	Infants_ride_post	.468	.400	.216	.264	.274	.196
	Public_service_of f_trained	.204	.337	.311	.320	.408	.365
	Harness_clip	.081	.179	.136	.459	.419	.380
	Infant_seats	.202	.480	.010	.004	.005	.447

Table 3

Correlation: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Safest_ palce	Safest_ practice	Ga_law_ posttest	Latch_ system	Infants_ ride_ posttest	Public_ service_ off_traind
Pearson Correlation	Use_css	.014	-.097	-.048	-.320	.014	-.142
	Advertising	.331	-.122	.000	.147	.044	.073
	Ga_css_law	-.176	-.058	.305	.192	.135	-.085
	Child_ride_back	.087	-.014	-.148	-.162	.109	-.080
	Convertible_seat	.158	-.007	-.153	-.197	.103	-.040
	Infant_seat_airbg	-.200	-.041	-.101	-.135	.147	-.060
	Safest_palce	1.000	-.287	-.034	-.019	-.147	.120
	Safest_practice	-.287	1.000	-.146	.055	-.042	.300
	Ga_law_posttest	-.034	-.146	1.000	.137	.035	.000
	Latch_system	-.019	.055	.137	1.000	-.198	.443
	Infants_ride_post	-.147	-.042	.035	-.198	1.000	-.431
	Public_service_o ff_trained	.120	.300	.000	.443	-.431	1.000
	Harness_clip	.185	.095	.094	.071	-.299	.262
	Infant_seats	-.023	-.033	.165	.031	-.096	-.049
Sig. (1-tailed)	Use_css	.469	.286	.390	.028	.468	.204
	Advertising	.024	.238	.500	.195	.400	.337
	Ga_css_law	.152	.367	.035	.131	.216	.311
	Child_ride_back	.308	.468	.195	.172	.264	.320
	Convertible_seat	.179	.484	.187	.125	.274	.408
	Infant_seat_airbg	.121	.406	.278	.216	.196	.365
	Safest_palce	.	.045	.422	.456	.196	.244
	Safest_practice	.045	.	.199	.374	.403	.038
	Ga_law_posttest	.422	.199	.	.213	.420	.500
	Latch_system	.456	.374	.213	.	.123	.003
	Infants_ride_post	.196	.403	.420	.123	.	.004
	Public_service_o ff_trained	.244	.038	.500	.003	.004	.
	Harness_clip	.140	.291	.293	.340	.038	.061
	Infant_seats	.447	.424	.168	.428	.289	.389

Table 4

Correlation: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Harness_clip	Infant_seats
Pearson Correlation	Use_css	-.238	.143
	Advertising	-.158	.009
	Ga_css_law	.188	.386
	Child_ride_back	-.018	-.430
	Convertible_seats	-.035	-.423
	Infant_seat_airbag	-.053	-.023
	Safest_palce	.185	-.023
	Safest_practice	.095	-.033
	Ga_law_posttest	.094	.165
	Latch_system	.071	.031
	Infants_ride_posttest	-.299	-.096
	Public_service_off_trained	.262	-.049
	Harness_clip	1.000	-.043
	Infant_seats	-.043	1.000
Sig. (1-tailed)	Use_css	.081	.202
	Advertising	.179	.480
	Ga_css_law	.136	.010
	Child_ride_back	.459	.004
	Convertible_seats	.419	.005
	Infant_seat_airbag	.380	.447
	Safest_palce	.140	.447
	Safest_practice	.291	.424
	Ga_law_posttest	.293	.168
	Latch_system	.340	.428
	Infants_ride_posttest	.038	.289
	Public_service_off_trained	.061	.389
	Harness_clip	.	.402
	Infant_seats	.402	.

The model summary tables (Tables 6-7) displayed if the model was effective in predicting CPSS use. The model was utilized to display the different effects (among the various predictors) and how they each relate to the outcome. The summary investigated the predictors (indicators for the three independent variables) against the outcome (use CPSS). The R-value was the multiple correlation coefficient between the independent variables' predictors and the dependent variable's predictor. The R-value when comparing the various predictors (indicators for the three independent variables) to the outcome was .482. The R^2 value helped to distinguish the variance proportion of the outcome (dependent variable) as compared to the predictors (independent variables). The R^2 value produced was .232. This value indicated that the predictors account for approximately 23.2% of total CPSS use variance (IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013). The adjusted R^2 shows if the model was able to be generalized. In order for the model to be considered generalizable, the adjusted R^2 value should be close or similar to the R^2 value. For the summary, the adjusted R^2 value was -.221. Although mathematically and statistically a negative R^2 value is not acceptable, it could imply that regression model did not adequately fit (or represented) the presented data. This value was not similar in nature to the acquired R^2 value of .232. Therefore, it could be determined that the model was not generalizable (with insufficient cross-validity) (Field, 2013; IBM SPSS Statistics Standard GradPack, n.d.; Laerd Statistics, 2013)

The change statistics helped to determine if the change in R^2 was significant. It helped to determine if adding different predictors to the model made a substantial difference. This statistic also showed the change if R^2 for each variable. In the summary, the R^2 increased by .232. However, the F change of .512 was not significant (.893). Therefore, indicating that the change/addition of predictors were not statistically significant. The Dublin-Watson section helped to determine if the assumption of independent errors was valid. The closer the value was to two, then greater likelihood that the assumption was valid. The Dublin-Watson value for the study was 1.516. Therefore, it could be determined that the assumption of independent errors was valid (the observations of each group were independent from one another) (Field, 2013; IBM SPSS Statistics Standard GradPack, n.d.).

Table 6

Model Summary: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

					Change Statistics		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1
1	.482[a]	.232	-.221	.38759	.232	.512	13

Table 7

Model Summary: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

	Change Statistics		
Model	df2	Sig. F Change	
1	22	.893	1.516

a. Predictors: (Constant), infant_seats, advertising, infant_seat_airbag, public_service_off_trained, ga_law_posttest, harness_clip, safest_practice, latch_system, infants_ride_posttest, child_ride_back, safest_palce, ga_css_law, convertible_seats
b. Dependent Variable: use_css

The ANOVA table (Table 8) indicated if the model was effective in utilizing the variables (predictors) to predict the outcome. The table showed the significance value at .893. Therefore, it could be determined that the model (and the use of the predicting variables were not significant in predicting the outcome (CPSS use) (Field, 2013; IBM SPSS Statistics Standard GradPack, n.d.).

Table 8

Anova: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.001	13	.077	.512	.893[b]
	Residual	3.305	22	.150		
	Total	4.306	35			

a. Dependent Variable: use_css
b. Predictors: (Constant), infant_seats, advertising, infant_seat_airbag, public_service_off_trained, ga_law_posttest, harness_clip, safest_practice, latch_system, infants_ride_posttest, child_ride_back, safest_palce, ga_css_law, convertible_seats

The coefficient tables (Table 9-11) displayed the parameters of the model. It showed the relationships and relevance of the predictors to the outcome. The coefficient table showed significance values for the independent variable predictors advertising, GA law, child ride back, convertible seats, infant seat airbag, safest place, safest practice, GA law pre/posttest, latch system infant ride pre/posttest, public service official trained, harness clip, and infant seats as .428, .781, .900, .911, .687, .771, .706, .886, .185, .743, .732, .193, .664 respectively. Since all of these independent variable predictors had *p* values greater than .05, it could be determined that none of the predictors were all statistically nonsignificant predictors of CPSS use (Field, 2013; IBM SPSS Statistics Standard GradPack, n.d.).

The unstandardized coefficients section displayed the degree of change for the dependent variable when compared to a particle independent variable (while holding another predictors constant). As the predictor variables advertising, GA law, child ride back, convertible seats, infant seat airbag, safest place, safest practice, GA law pre/posttest, latch system, infant ride pre/posttest, public service official trained, harness clip, and infant seats increased by one unit, the outcome (CPSS use) would change. These changes included a decrease by .036 for advertising, an increase by .008 for GA law, a decrease by .011 for child ride back, an increase by .010 for convertible seats, a decrease by .188 for infant seat airbag, an increase by .049 for safest place, a decrease by .126 for safest practice, a decrease by .012 GA law pre/posttest, a decrease by .244 for latch system, a decrease by .027 for infants ride pre/posttest, an increase by .099 for public

service officials trained, a decrease by .148 for harness clip, and an increase by .095 for infant seats.

The "standard beta section values tells the number of standard deviations that the outcomes will change as a result of one standard deviation change in the predictor" (Field, 2013, p. 340). Therefore, as advertising increased by one unit, CPSS use decreased by .186 units; as GA law increased by one unit, CPSS use increased by .073 units; as child ride back increased by one unit, CPSS use decreased by .091 units; as convertible seats increased by one unit, CPSS use .087 units; as infant seat airbag increased by one unit, CPSS use decreased by .089 units; as safest place increased by one unit, CPSS use increased by .069 units; and as safest practice increased by one unit, CPSS use decreased by .083 units. In addition, as GA law pre/posttest increased by one unit, CPSS use decreased by .030 units; as latch system increased by one unit, CPSS use decreased by .343 units; as infants ride pre/posttest increased by one unit, CPSS use decreased by .075 units; as public service officials trained increased by one unit, CPSS use increased by .090 units; as harness clip increased by one unit, CPSS use decreased by .304 units; and as infant seats increased by one unit, CPSS use increased by .111 units (Field, 2013; IBM SPSS Statistics Standard GradPack, n.d.).

The confidence interval section displayed the relationship between the beta (b) values for the sample compared to the b value of the population. A small confidence interval indicated that the b value in the sample is true to the b value in the population. The values (lower bound compared to upper bound) should not cross zero. The closer the

lower bound values are to the upper bound values (without crossing zero), the greater likelihood that the values are true representation of the population values. All of the independent variable predictors' lower bound units were negative in value and all of the upper bound units were positive in value. In addition, all of the values crossed the zero dimension (moving from negative to positive values). Therefore, it could be determined that there is limited likelihood that the values were true representations of the population values (IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013).

Table 9

Coefficients: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.835	1.058		1.734	.097
	Advertising	-.036	.045	-.186	-.808	.428
	Ga_css_law	.008	.029	.073	.281	.781
	Child_ride_back	-.011	.085	-.091	-.127	.900
	Convertible_seats	.010	.090	.087	.113	.911
	Infant_seat_airbag	-.188	.459	-.089	-.409	.687
	Safest_palce	.049	.166	.069	.294	.771
	Safest_practice	-.126	.330	-.083	-.382	.706
	Ga_law_posttest	-.012	.085	-.030	-.145	.886
	Latch_system	-.244	.178	-.343	-1.368	.185
	Infants_ride_posttest	-.027	.082	-.075	-.333	.743
	Public_service_off_traid	.099	.285	.090	.347	.732
	Harness_clip	-.148	.110	-.304	-1.343	.193
	Infant_seats	.095	.216	.111	.440	.664

a. Dependent Variable: use_css

Table 10

Coefficients: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

Model		95.0% Confidence Interval for B		Correlations		
		Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	-.360	4.029			
	advertising	-.130	.057	-.157	-.170	-.151
	Ga_css_law	-.052	.068	-.019	.060	.052
	Child_ride_back	-.187	.165	-.050	-.027	-.024
	Convertible_seats	-.177	.197	-.011	.024	.021
	Infant_seat_airbag	-1.140	.765	-.068	-.087	-.076
	Safest_palce	-.295	.392	.014	.063	.055
	Safest_practice	-.809	.558	-.097	-.081	-.071
	Ga_law_posttest	-.188	.163	-.048	-.031	-.027
	Latch_system	-.613	.126	-.320	-.280	-.256
	Infants_ride_posttest	-.197	.143	.014	-.071	-.062
	Public_service_off_train	-.492	.689	-.142	.074	.065
	Harness_clip	-.376	.080	-.238	-.275	-.251
	Infant_seats	-.353	.543	.143	.093	.082

a. Dependent Variable: use_css

Table 11

Coefficients: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	advertising	.661	1.514
	Ga_css_law	.522	1.916
	Child_ride_back	.067	14.856
	Convertible_seats	.059	16.972
	Infant_seat_airbag	.733	1.365
	Safest_palce	.626	1.596
	Safest_practice	.732	1.366
	Ga_law_posttest	.837	1.194
	Latch_system	.554	1.805
	Infants_ride_posttest	.679	1.474
	Public_service_off_trained	.521	1.919
	Harness_clip	.682	1.466
	Infant_seats	.547	1.828

a. Dependent Variable: use_css

The variable entered/removed table (Table 12) showed the possible effects of the removed variables (if utilizing the hierarchical method). This table portrayed the significance of the deleted variables if they were actually incorporated in the analysis. There were no variables removed from the analysis (IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013).

Table 12

Variables Entered/Removed: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

Model	Variables Entered	Variables Removed	Method
1	Infant_seats, Advertising, Infant_seat_ airbag, Public_service _off_trained, Ga_law_post Harness_clip, Safest_practic Latch_system, Infants_ride_ posttest, Child_ride_ back, Safest_palce, Ga_css_law, Convertible_ seats[b]		. Enter

Remove this blank line.

a. Dependent Variable: use_css

b. All requested variables entered.

The collinearity diagnostics tables (Table 13-16) examined if multicollinearity existed. This table looked at the distribution of variance proportions to determine if the predictors were distributed across different dimensions. The variance proportions should vary between 0 and 1. For all of the independent variable predictors (advertising, GA law, child ride back, convertible seats, infant seat airbag, safest place, safest practice, GA law pre/posttest, latch system, infant ride pre/posttest, public service official trained, harness clip, and infant seats), the eigenvalue were between 0 and 1 (.975, .708, .385, .210, .189, .093, .058, .047, .039, .029, .016, .012, and .003 respectfully). Therefore, it could be determined that the assumption of multicollinearity had not been violated (IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013).

Table 13
Collinearity Diagnostics: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

				Variance Proportions		
Model	Dimension	Eigenvalue	Condition Index	(Constant)	Advertising	Ga_Css_law
1	1	11.236	1.000	.00	.00	.00
	2	.975	3.395	.00	.02	.09
	3	.708	3.984	.00	.00	.38
	4	.385	5.402	.00	.66	.03
	5	.210	7.322	.00	.00	.02
	6	.189	7.702	.00	.01	.06
	7	.093	10.991	.00	.05	.00
	8	.058	13.885	.00	.01	.01
	9	.047	15.478	.00	.11	.01
	10	.039	17.009	.00	.04	.01
	11	.029	19.655	.00	.00	.04
	12	.016	26.307	.00	.00	.18
	13	.012	30.311	.01	.00	.09
	14	.003	60.504	.99	.10	.09

a. Dependent Variable: use_css

Table 14

Collinearity Diagnostics: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Variance Proportions				
Model	Dimension	Child_ride_ back	Convertible_ seats	Infant_seat_ airbag	Safest_palce	Safest_ practice
1	1	.00	.00	.00	.00	.00
	2	.01	.01	.00	.00	.00
	3	.00	.00	.00	.00	.00
	4	.00	.00	.00	.00	.00
	5	.00	.00	.00	.00	.00
	6	.00	.00	.00	.00	.00
	7	.00	.00	.00	.02	.00
	8	.00	.00	.01	.00	.06
	9	.01	.00	.01	.10	.25
	10	.12	.10	.10	.13	.02
	11	.01	.01	.19	.01	.24
	12	.06	.02	.16	.24	.19
	13	.74	.75	.12	.31	.08
	14	.04	.10	.41	.20	.14

a. Dependent Variable: use_css

Table 15

Collinearity Diagnostics: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

		Variance Proportions				
Model	Dimension	Ga_law_ posttest	Latch_system	Infants_ride_ posttest	Public_service _off_trained	Harness _clip
1	1	.00	.00	.00	.00	.00
	2	.01	.00	.00	.00	.00
	3	.00	.00	.00	.00	.00
	4	.00	.00	.00	.00	.01
	5	.05	.02	.34	.02	.03
	6	.85	.00	.04	.00	.00
	7	.00	.35	.03	.02	.18
	8	.01	.10	.20	.01	.44
	9	.02	.10	.05	.09	.04
	10	.00	.02	.08	.17	.04
	11	.00	.11	.01	.44	.02
	12	.01	.00	.17	.15	.12
	13	.00	.11	.01	.09	.09
	14	.05	.18	.06	.01	.03

a. Dependent Variable: use_css

Table 16

Collinearity Diagnostics: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

Model	Dimension	Variance Proportions Infant_seats
1	1	.00
	2	.00
	3	.00
	4	.00
	5	.00
	6	.00
	7	.01
	8	.08
	9	.04
	10	.00
	11	.04
	12	.52
	13	.02
	14	.30

a. Dependent Variable: use_css

The casewise diagnostics table (Table 17) was utilized to check residuals for evidence of bias. This table looked for extreme cases that may lie outside the study norm (cases that have a standard residual value of greater than two or less than two). It was expected to acquire approximately 5% of the two-sample population to lie outside the expected norm. Although casewise diagnostics were selected during analysis, a casewise diagnostics table was not created/displayed. Therefore, it could be determined that no outliers existed. Therefore, these results could imply that the model was reasonably accurate (IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013).

Table 17

Residual Statistics: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.8189	1.4706	1.1389	.16908	36
Std. Predicted Value	-1.892	1.962	.000	1.000	36
Standard Error of Predicted Value	.130	.388	.232	.068	36
Adjusted Predicted Value	.7256	6.6577	1.3681	1.00288	35
Residual	-.47063	.74724	.00000	.30729	36
Std. Residual	-1.214	1.928	.000	.793	36
Stud. Residual	-1.707	2.089	-.071	.993	35
Deleted Residual	-5.65775	1.15693	-.22522	1.09820	35
Stud. Deleted Residual	-1.790	2.279	-.052	1.045	35
Mahal. Distance	2.970	34.028	12.639	8.132	36
Cook's Distance	.000	15.012	.512	2.544	35
Centered Leverage Value	.085	.972	.361	.232	36

a. Dependent Variable: use_css

Figures

The Histogram (Figure 2) displayed a normal bell shape, therefore determining that the distributions are normal.

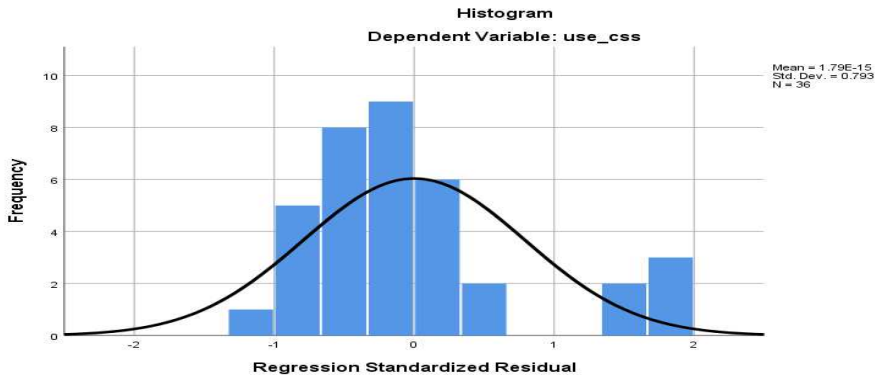


Figure 2

Histogram: Regression Standardized Residual and Frequency.

The P-P Plot (Figure 3) showed minimal deviations from the diagonal line, it could still be determined that the distributions could be normal. Bootstrapping could be conducted to better assess the true population value for the predictors. Attempts were made to calculate the bootstrap for coefficients. However, results were not acquired. This finding may have occurred because no violations of normality and homoscedasticity existed (IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013).

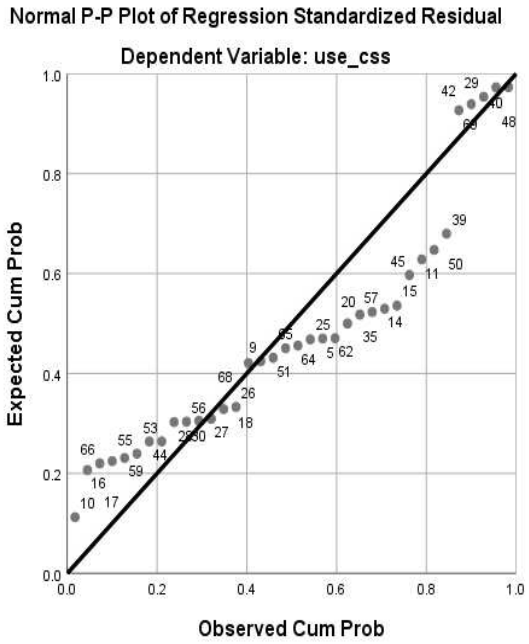


Figure 3

Normal P-Plot: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11).

As previously mentioned, the scatter plots (Figure 1 and Figures 4-16) investigated the assumptions of linearity and homoscedasticity. If the dots are randomly scattered (not funneled or curved shape), then it could be assumed the assumptions held true. As previously stated, although there are areas on the plot where there existed groups of dots (which were aligned close together), the group dots were randomly scattered. Therefore, it could be assumed that linearity and homoscedasticity were valid.

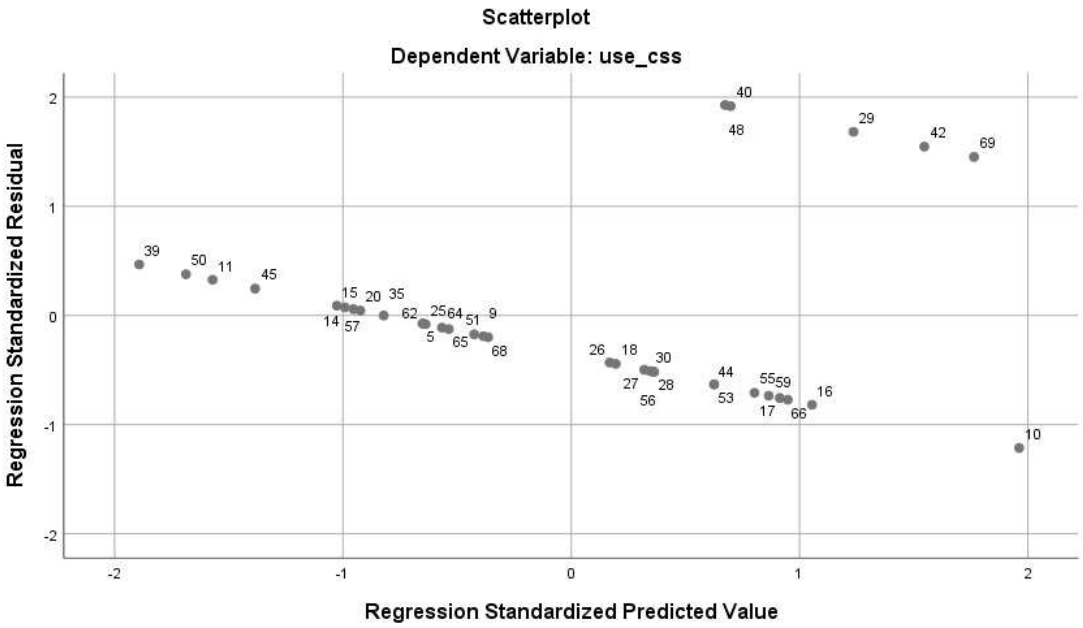


Figure 1

Scatterplot: Use CPSS and Advertising, GA Law, Pre/Post Test (1-11).

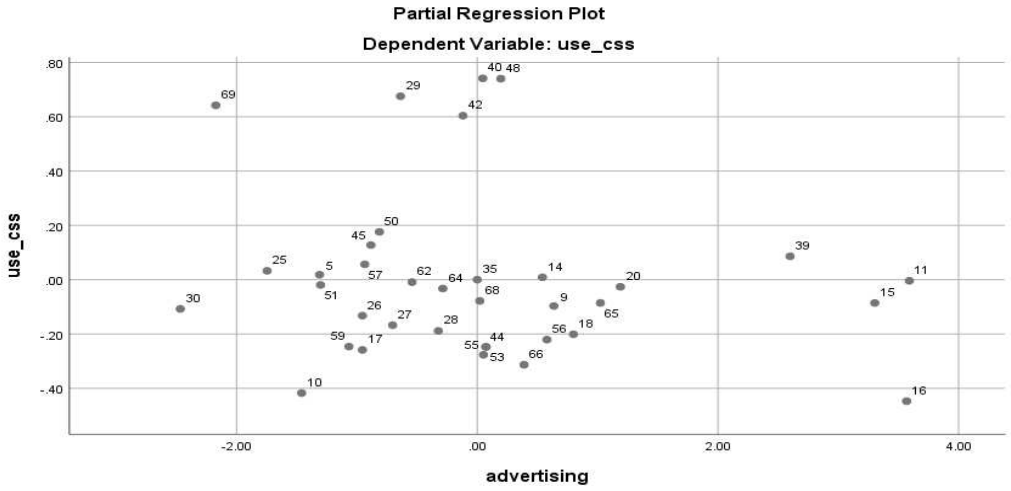


Figure 4

Partial Regression Plot: Use CSS and Advertising.

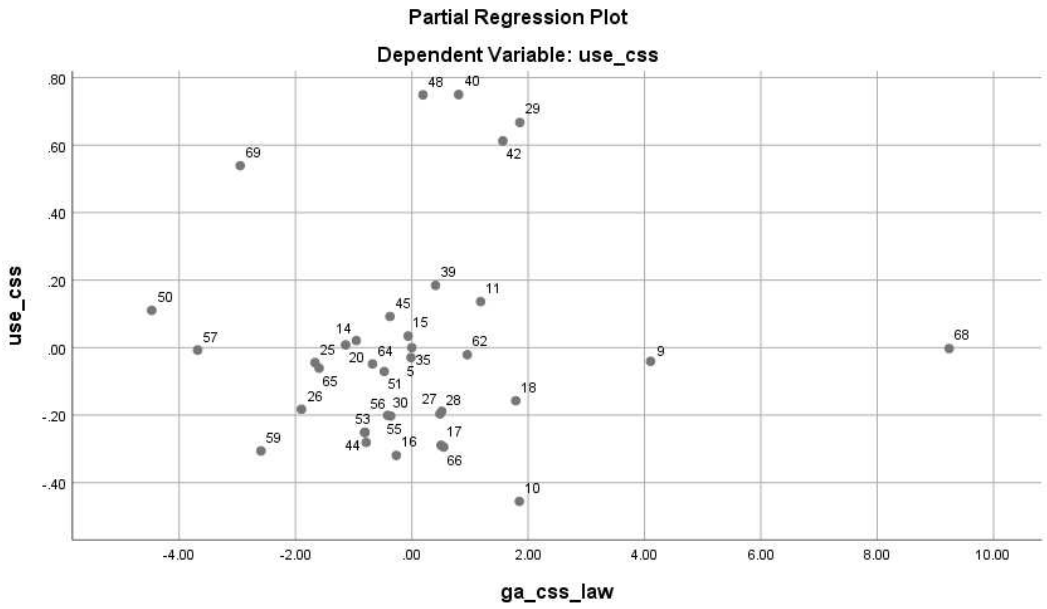


Figure 5

Partial Regression Plot: Use CSS and GA CSS Law.

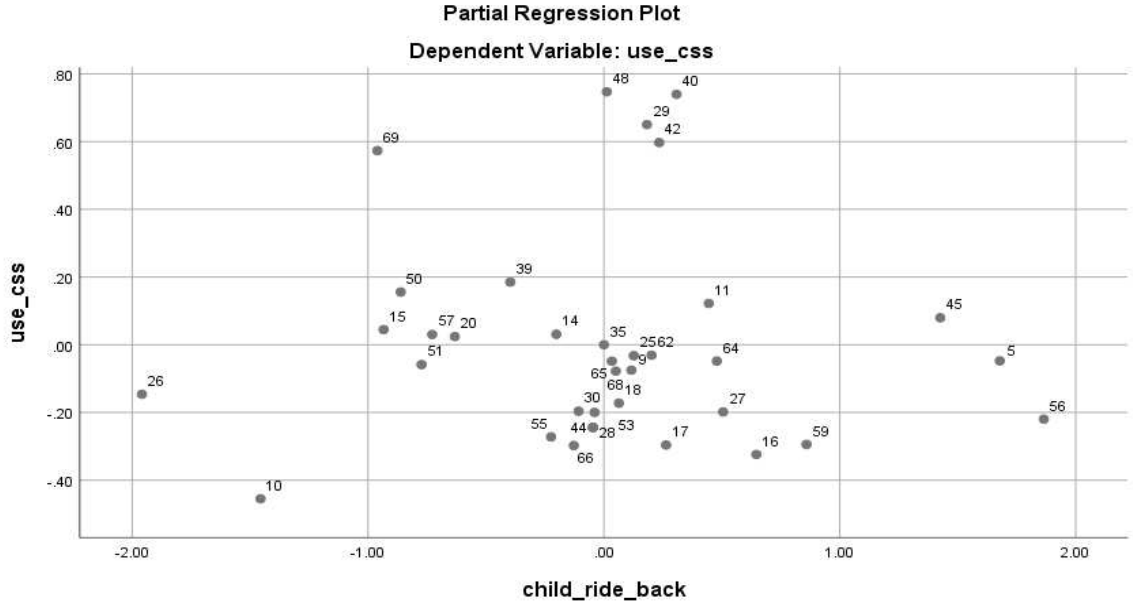


Figure 6

Partial Regression Plot: Use CSS and Child Ride Back.

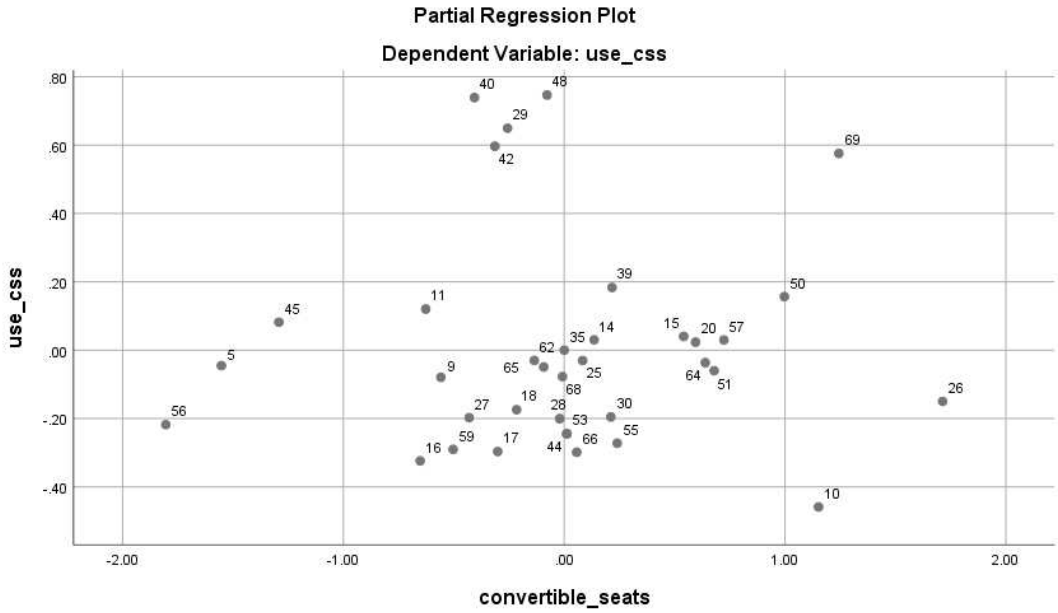


Figure 7

Partial Regression Plot: Use CSS and Convertible Seats.

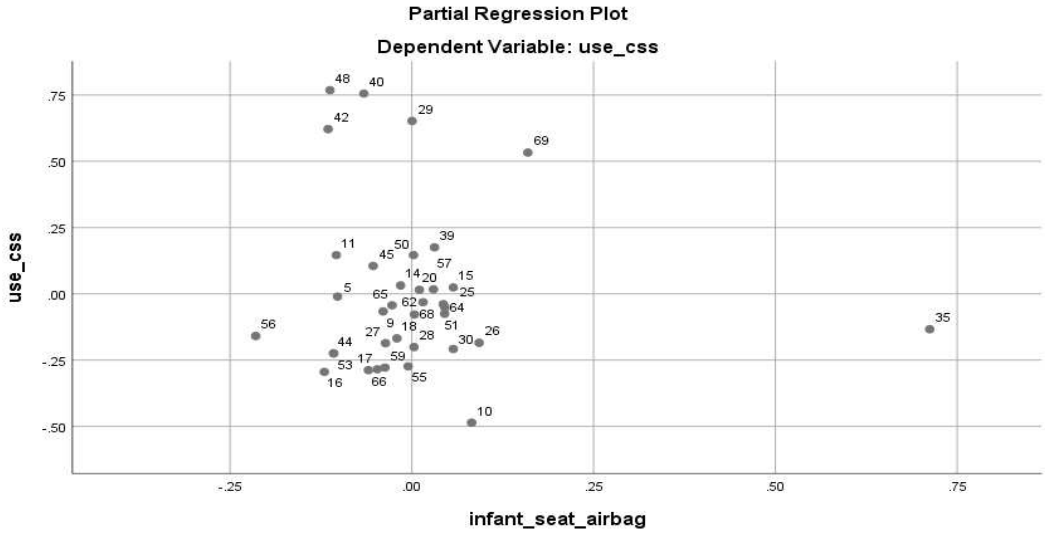


Figure 8

Partial Regression Plot: Use CSS and Infant Seat Airbag.

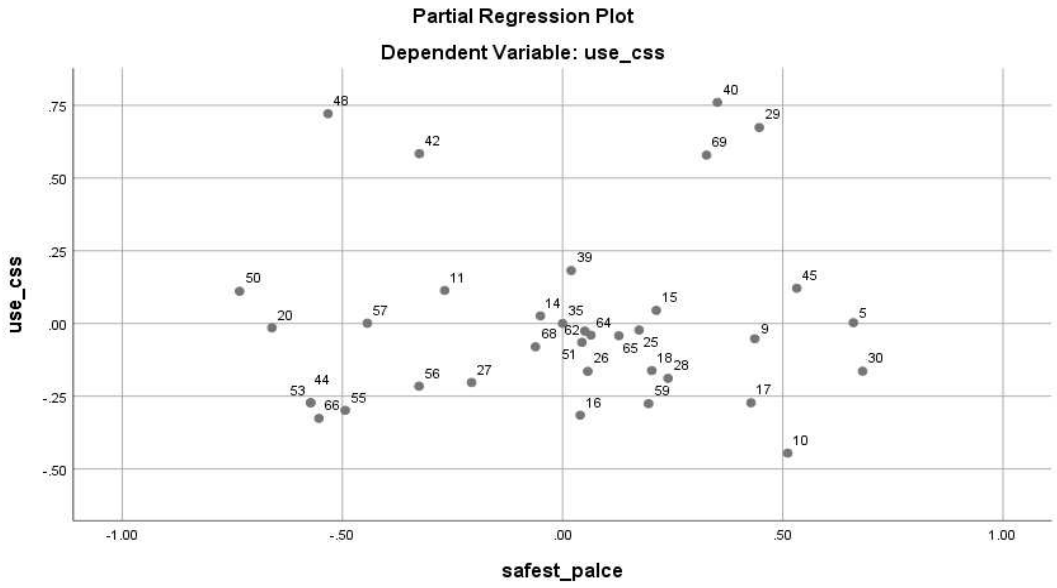


Figure 9

Partial Regression Plot: Use CSS and Safest Place.

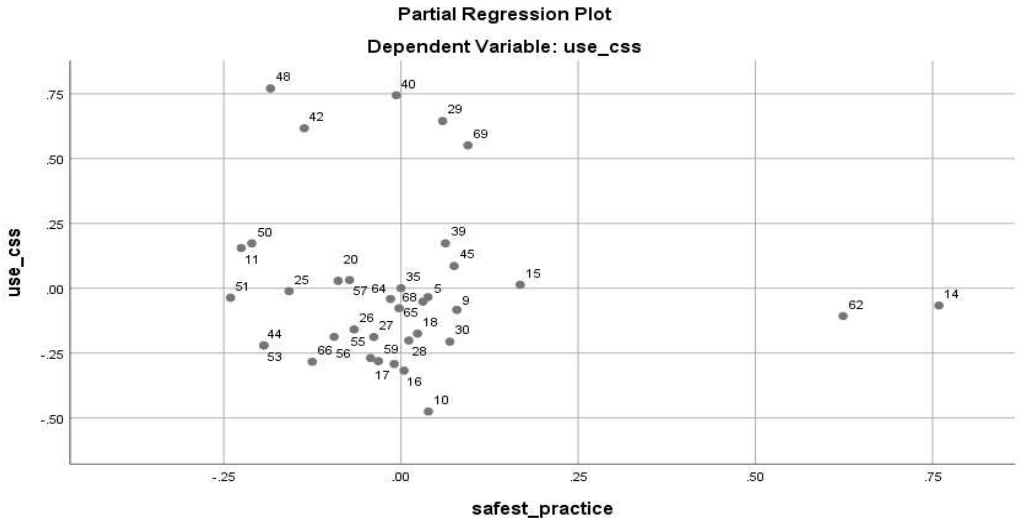


Figure 10

Partial Regression Plot: Use CSS and Safest Practice.

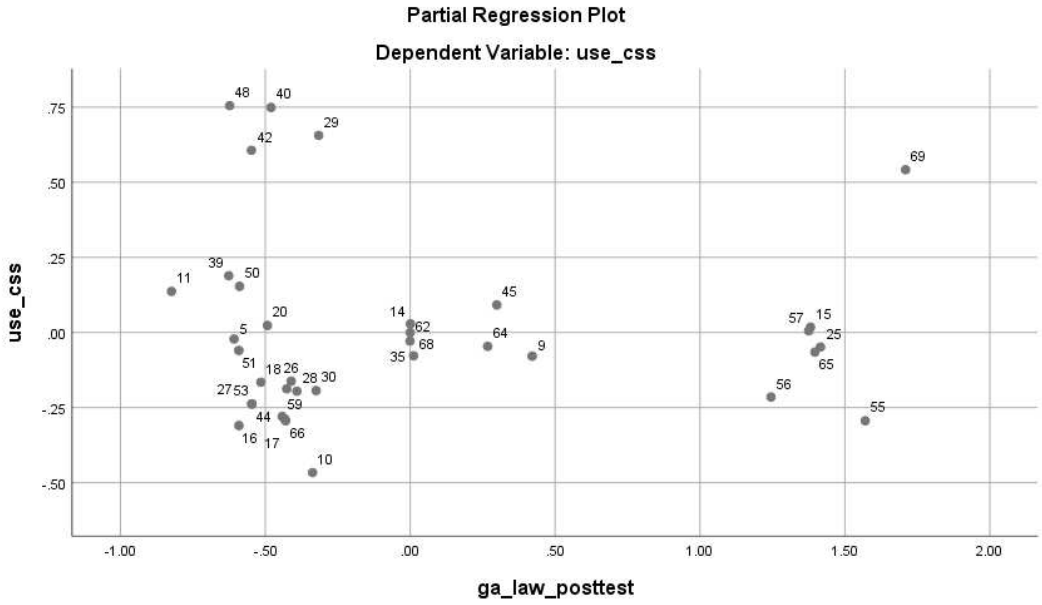


Figure 11

Partial Regression Plot: Use CSS and GA Law Posttest.

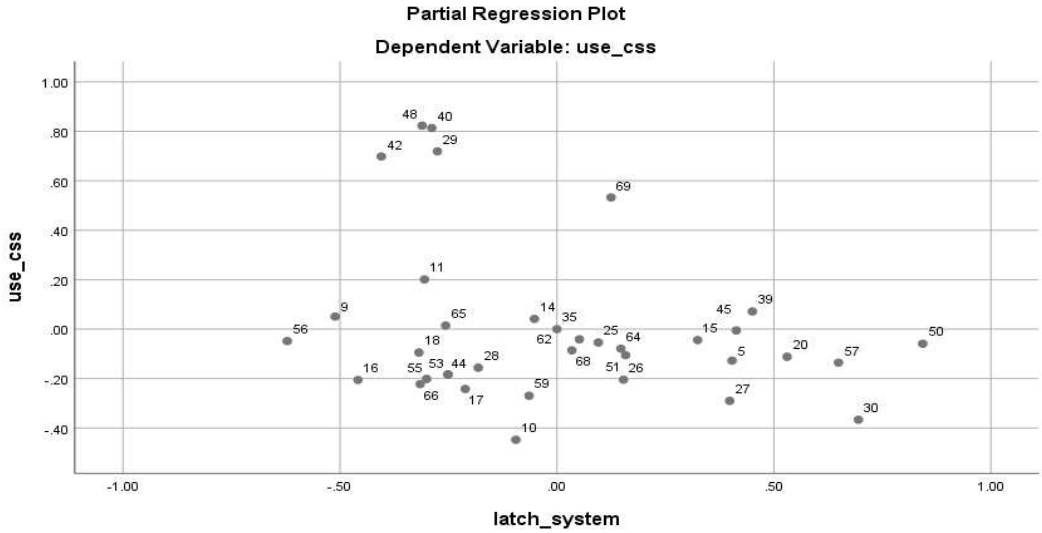


Figure 12

Partial Regression Plot: Use CSS and Latch System.

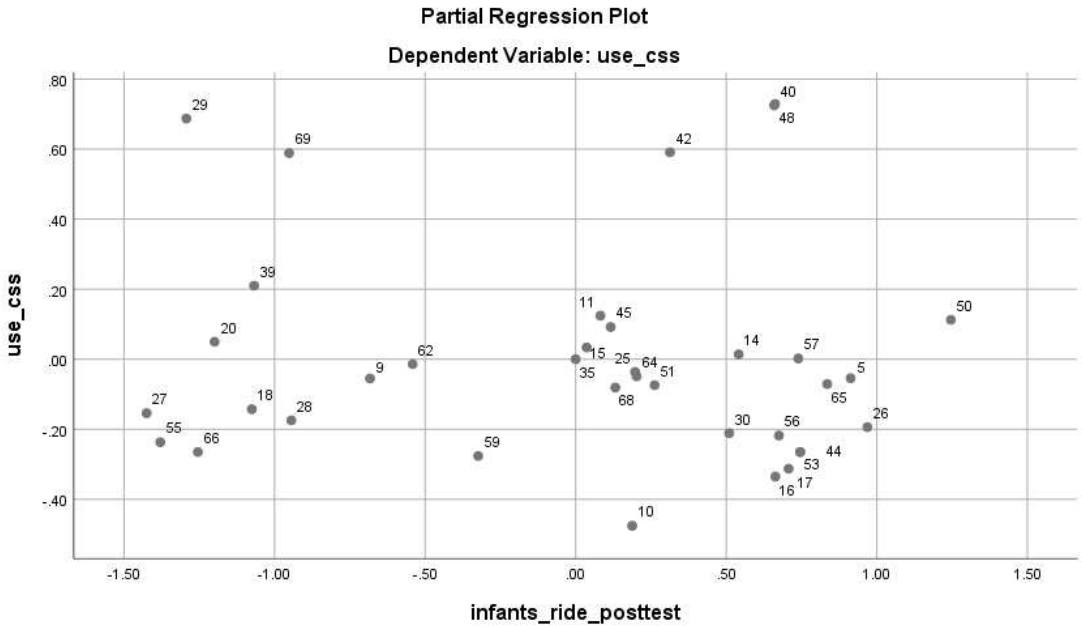


Figure 13

Partial Regression Plot: Use CSS and Infant Ride Posttest.

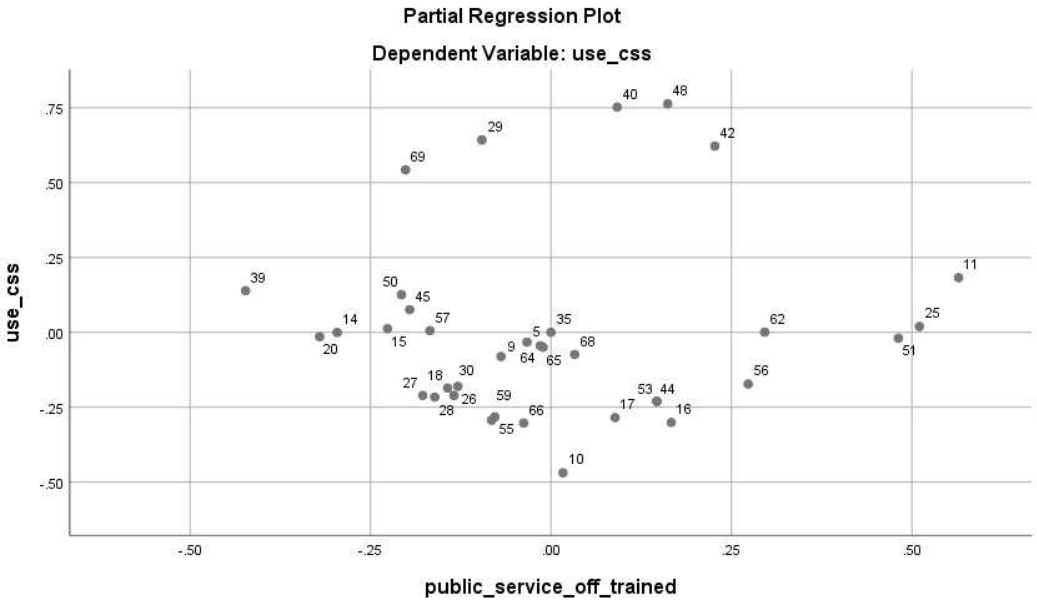


Figure 14

Partial Regression Plot: Use CSS and Public Service Officer Trained.

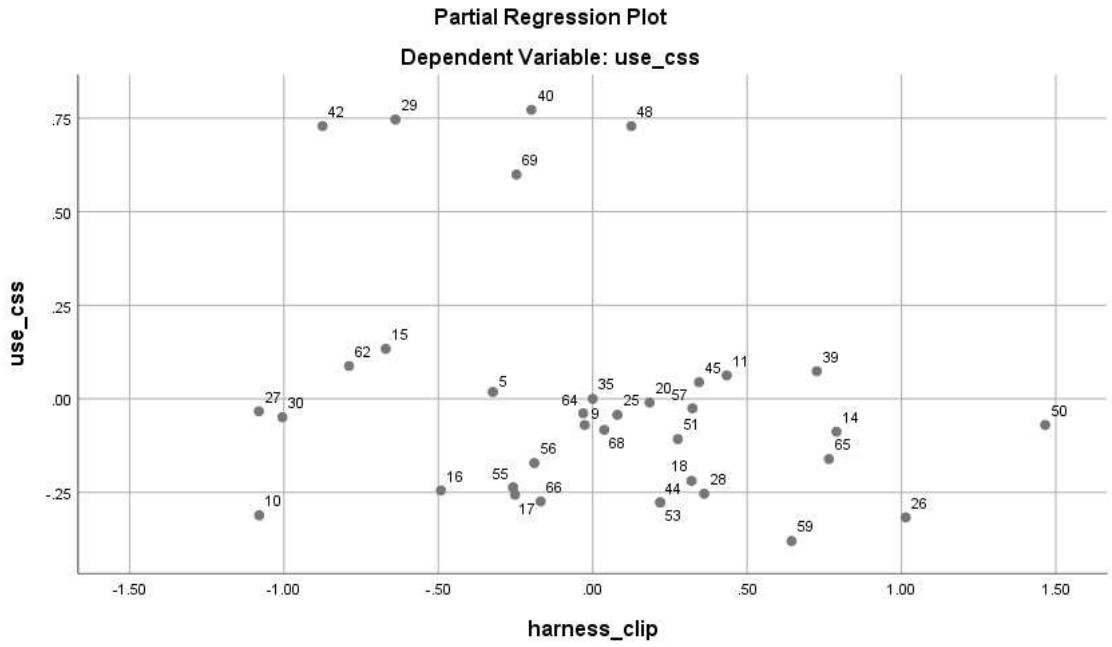


Figure 15

Partial Regression Plot: Use CSS and Harness Clip.

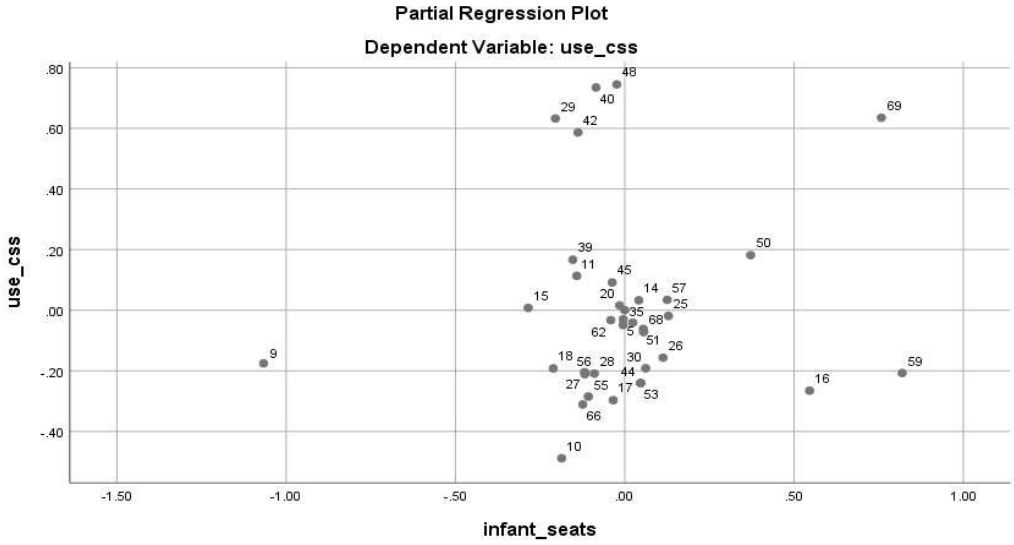


Figure 16

Partial Regression Plot: Use CSS and Infant Seats.

Summary

This chapter discussed the results achieved from the study. The results included the utilization of linear multiple regression analysis to produce a variety of measures. These measures included descriptive data (frequencies and charts for various variables utilized) and testing of the hypotheses (proving/disproving underlying assumptions and data outputs. The data outputs achieved encompassed correlations, a model summary, ANOVA, coefficients, collinearity diagnostics, residual statistics, and charts (histogram, normal p plot of regression, scatter plots, and partial regression plots).

Overall, the chapter depicted that in many of the instances, the Pearson's Correlation values were negative (but between 1 and +1). The closer the correlation value is to +/-1, the closer to a perfect linear relationship. Therefore, the correlations existed between the variable; since all of the predictors' values were less than .9, it could be assumed that there existed no collinearity (and the assumption of multicollinearity held true); since only 36 participants answered all of the indicated predictors (small N total), it tended to be quite problematic in various areas (including, but limited to proving statistical significance and study generalization) as well as affected the statistical power (producing lower power results); and the adjusted R^2 value was -.221. Although mathematically and statistically a negative R^2 value is not acceptable, it could imply that regression model did not adequately fit (or represented) the presented data. This value was not similar in nature to the acquired R^2 value of .232. Therefore, it could be determined that the model was not generalizable (with insufficient cross-validity).

In addition, since all of the independent variable predictors had *p* values greater than .05, it could be determined that none of the predictors were all statistically nonsignificant predictors of CPSS use and all of the independent variable predictors' lower bound units were negative in value and all of the upper bound units were positive in value (as well as all of the values crossed the zero dimension moving from negative to positive values). Therefore, it could be determined that there is limited likelihood that the values were true representations of the population values.

It was also determined that no outliers existed. Therefore, these results could imply that the model was reasonably accurate, and linearity/homoscedasticity was valid. As the Histogram displayed a normal bell shape, therefore determining that the distributions are normal. In addition, although the P-P Plot showed minimal deviations from the diagonal line, it could still be determined that the distributions could be normal. The concluding chapter provides a final discussion of the research including results/findings, potential social change, limitations, and recommendations associated with the study.

Chapter 5: Summary, Recommendations, and Conclusions

Introduction

The research consisted of a cross-sectional, quantitative study on the relationship between the CPSS usage rates and the variables of parents' knowledge related to CPSS installation, use, and compliance; GA CPSS laws/regulations; and CPSS marketing techniques. The study included the use of a convenience sample of parents in Fulton County, Georgia who were involved in various CPSS check events. Although the initial data collection procedures involved retrieving data within a 1-month period, data were actually collected throughout a 3-month period (due to the limited number of scheduled classes and events). In addition, the initial survey included a 10-page questionnaire, where the first four pages contained general CPSS questions (pertaining to the studied variables); a two-page pre/posttest given to the participants prior to the CPSS event; and a four-page observation opinion survey regrading marketing and advertisement strategies. However, it was noted (from the first two CPSS events) that the survey was too long, and participants were getting tired and frustrated regarding the amount of questions and time it took to complete the questionnaire. Therefore, the survey was reduced to the first six pages to allow and encourage participant involvement and survey completion.

In addition, 93 surveys were distributed, and only 71 surveys were returned (76.34% return rate). However, not all of the 71 surveys were completed (with only 36 surveys used for full completion - 50.70% completion rate). This completion rate was possibly due to administration and completion time of the survey, the length the survey,

and the time availability of the participants. Due to these issues, the *N* total was based on the completed survey items selected for the analysis. In addition, several analyses were performed (various cross tabulations and linear regression analysis; Appendix E, Tables 1-32). However, due to the abundance of information (and long length of the report) as well as the similarities in data results, only one set of analysis (regression analysis for advertising, GA law, installation techniques with use CPSS) is discussed in this chapter. In addition, these tabulations were conducted with a variety of variables; however, each analysis produced similar results (to the ones provided in this study). A full list of SPSS syntax and output tables/figures could be provided upon request.

Issues with sampling procedures in this study were also present. I initially attempted to reach approximately 120 participants (to account for loss to follow-up and/or incompleteness of the program). Of this amount, roughly 60- 90 were expected to participate with the surveys (including the loss of approval by study participants and/or the non-presence of an authorized parent/guardian). The sample amount was chosen by the rationale that there should be a minimum of 30 participants per studied independent variable (30 x 3 = 90). Therefore, a minimum of 90 total study participants was needed (Laerd Statistics, 2012c). Although I attempted to use three main IVs (parents' knowledge/understanding of proper CPSS installation techniques, parents' knowledge/understanding of CPS laws and regulations, and parents' knowledge/understanding of CPS marketing strategies), the predictors used in the analysis actually include 13 items (advertising, GA law, child ride back, convertible

seats, infant seat airbag, safest place, safest practice, Ga law pre/posttest, latch system, infant ride pre/posttest, public service official trained, harness clip, and infant seats). These items represented predictors of the various IVs using the same sampling rationale, 13 predictors x 30 = 390. Typically, the larger the sample size, the better the statistical (and power) results of the study. This amount could fall anywhere between 30 (for smaller studies) to 400 (for larger studies). In addition, the larger the sample size, the smaller the confidence interval (Creative Research Systems, 2012; Dissertation India, 2011). Therefore, the study may have received better results (including generalizable statistically significant outcomes) if it focused on reaching 390 participants (with room for loss to completion).

Interpretation of the Findings

The overall test results showed that the three alternative hypotheses should not be accepted (accepting the null hypothesis). There was no significant relationship/difference between the IV predictors (advertising, GA law, child ride back, convertible seats, infant seat airbag, safest place, safest practice, GA law pre/posttest, latch system, infant ride pre/posttest, public service official trained, harness clip, and infant seats) and the DV (CPSS use) while controlling for confounding factors. In addition, the change statistics showed that the model did not have a significant *F* change (.893). Therefore, it could be determined that there was no level of statistical significance with the change/addition of the predictors. The analysis results also showed that infant seats had the greatest Pearson's correlation value (.143). Therefore, it could best predict CPSS use.

The small sample size may have impacted the standard error and confidence intervals. By increasing the sample size, the standard errors and confidence intervals could have been reduced. In regard to the analysis of multiple variables, if certain variables were omitted or eliminated, variable bias may have occurred. Variable bias could depend on factors including

> over-estimating (upward bias) or under-estimating (downward) the effect of one of more other explanatory variables. Two conditions must hold for omitted variable bias to exist: a) the omitted variable must be correlated with the dependent variable and b) The omitted variable must be correlated with one or more other explanatory/ independent variables. (Albert, 2016, para 2)

In addition, "the subject/variable ratio is an attempt to ensure that the study sample is "large enough" to minimize "parameter inflation" and improve "replicability" (Psych Unlimited, n.d., p. 1)

The coefficient table showed that although all of the IV predictors had *p*-values greater than .05 (and that it could be determined that they were all not significant predictors in CPSS use) and the predictor infant seats had the greatest impact with *t* value of .440. Furthermore, all of the confidence intervals b values crossed 0. The overall study was not statistically significant, and the results should not be generalized to the population at large (IBM SPSS Statistics Standard GradPack, n.d.; Field, 2013).

There was a gap in knowledge pertaining to this topic. Few studies have been performed concentrating on the effects of CPS and marketing (as they relate to CPSS

usage). Although I was not able to produce significant results, it does not negate the fact that CPS is an important issue. As mentioned in my literature review, several scholars have proven the need and justification for CPSS efforts. (2012) evaluated strategies for a cross-sectional (cluster-randomized trail) CPSS program in Sydney Australia. The goals of the program (that included educational workshops, CPSS distribution, and CPSS installation stations) was to assist in the reduction of child-related traffic injuries and deaths as well as increase the presence of CPSS legislation (geared towards the enforcement of age-appropriate proper CPSS installation and use; Keay et al., 2012). Study results showed that there was an increase number of children riding in age-appropriate CPSS as well as a decrease number of CPSS installation errors (Keay et al., 2012). The information obtained in Keay et al.'s study (as well as background information presented in Chapters 1 and 2 of this dissertation) justifies the need for not only CPSS education efforts, but also the need for standardization and enforcement of CPSS-related laws, guidelines, and regulations. In addition, it portrays the value for multifaceted community-based initiatives that are culturally represented. I stopped reviewing here. Please go through the rest of your chapter and look for the patterns I pointed out to you. I will now look at your reference list.

Therefore, the results gained in this study (within Fulton County, GA) should not be misjudged or misinterpreted as invaluable or not holding any public health significance. It could be assumed that even though statistical significance was not achieved, it provides the opportunity for future research (possibly with a longer

evaluation time frame and/or larger study group). Child passenger safety still continues to be an important topic at hand that should remain at the forefront of public health.

Implications of Social Change

This study proved to be statistically non-significant (for a variety of reasons) and social change could not successfully be determined. However, with modifications, the study could have the ability to promote more positive results (and the potential to reduce child-related motor vehicle injuries and deaths) in Fulton County, Georgia. As previously stated, the achieved results could have been contributed to the study's low survey completion rates, coupled with a convenience cross-sectional study design. If another opportunity presents itself, the study should be replicated, however modified (on a larger scale for a longer period). At that point, the study may have a stronger possibility to impact the community (with noteworthy results).

Within the past two decades, child passenger injuries and deaths have been on the rise. One of the main reasons for this influx in tragedies is primarily due to the high levels of nonuse coupled with misuse of child safety seats (Keay et al., 2012). However, few studies have been conducted on the correlation between parents' knowledge of CPSS issues and CPSS usage rates (National Center for Statistics & Analysis-Traffic Safety Facts, 2005a). Therefore, this is just the beginning of possible future studies on this topic.

Delimitations and Limitations of Study

Delimitations existed within this study. These delimitations included issues with internal validity (study design, testing, and selection bias). This research utilized a cross sectional study design. The population and data samples were obtained from information gathered within a three-month time-period. This time-period was not sufficient in predicting a true correlation between any of the indicated variables. In addition, testing dilemmas occurred. These issues included the length of the instrument (participants verbalized that the survey was too long and time consuming) and the time the instrument was administered. The CPSS events typically took place in the mornings and many of the parents came to the events with their young children. However, the young children required a great amount of attention and, unfortunately, many of the parents were unable to adequately and sufficiently complete the survey. Another issue included the location where the instrument was administered (given at the onset of the CPSS events, within areas with limited writing space). Therefore, due to these listed concerns, there existed a low completion rate (producing insignificant, non-generalizable results) as well as possible selection bias (Simon, 2011). As I previously stated, 93 surveys were distributed, but only 71 was turned in (return rate of 76.34%). However, not all of the 71 surveys were completed (with only 36 surveys utilized for full completion- 50.70% completion rate).

There were also limitations in the study. As I previously stated, since the research included a cross-sectional study (within a three-month period), generalization and

sampling limitations were present (especially due to the low completion rate and the utilization of a convenience sample) (Simon, 2011). External validity issues stemmed from a number of factors. Since a convenience sample was utilized, a true data representation of the county/state could not be made. In addition, the low number of participants who fully completed the survey made the results statistically insignificant and the lack of true random sampling made it difficult to generalize the results to the entire population, causing concerns with both internal and external validity (Simon, 2011). The study also contained additional limitations such as the presence of biases (selection of participants) and the incorrect or non-reporting of information or results (ex: child's demographics, vehicle's information, usage of CPSS and occupant restraint systems, etc.) (Huniqian, Jingzhen, Xiangxiang, Xiaojunm & Liping, 2016; Xiangxiang, Jingzhen, Fuyuan, & Liping, 2016). In addition, the loss of participants to study follow up as well as the limited time to conduct a long-term study evaluation (possibly due to limited resources-time, finances, and people) also existed (Xiangxiang et al., 2016).

Recommendations for Future Research

The study did not produce statistically significant results and the null hypotheses were supported. However, findings from the study could assist with future research on this topic. There have been quite a number of research studies pertaining to CPSS issues (especially in regard to knowledge and educational efforts). However, few studies exist centers on knowledge, marketing strategies, and enforcement policies. Therefore, a recommendation would be to conduct this study (and other studies similar in nature) in

the future with modifications. The studies should be conducted for a longer period with a greater sample size. For example, the study should still comprise of residents in the Fulton County area (due to the high volume of motor vehicle injuries/fatalities incidences). However, it should also be able to be replicated (therefore generalizable) in surrounding counties that hold similar characteristics in population size and characteristics. In addition, the survey instrument should be shorter in length (providing a higher probability in the completion rate).

Conclusion

Although the study's results were found to be non-significant, the results did provide descriptive data that could serve useful in the future (e.g., parents CPSS installation and usage knowledge, marketing strategies, and enforcement policies, etc.). With this new-found information (as well as results from future research), those working in the public health, social services, medical, and political fields would be able to adequately address motor vehicle and CPSS concerns while at the same time planning, designing, implementing, evaluating, treating, and enforcing successful child occupant injury prevention initiatives.

References

AAA Foundation for Traffic Safety. (2005). *A guidebook for observing occupant restraint system use and misuse*. Washington, DC: TransAnalytics.

About Education. (2014). What is a cross-sectional study? Retrieved from http://psychology.about.com/od/cindex/g/cross-sectional.htm

Advocates for Highway and Auto Safety. (2013). Child passenger safety. Retrieved from http://www.saferoads.org/child-passenger-safety

Agency for Toxic Substances and Disease Registry. (1994). A primer on health risk communication. Retrieved from https://www.atsdr.cdc.gov/risk/evalprimer/why.html

Agency for Toxic Substances and Disease Registry. (2005). Public health assessment: Guidance manual (2005 Update) - Chapter 4: Involving and communicating with the community. Retrieved from http://www.atsdr.cdc.gov/HAC/PHAmanual/ch4.html

Agency for Toxic Substances and Disease Registry. (2016). Agency for toxic substances and disease registry. Retrieved from http://www.atsdr.cdc.gov/

Agran, P., Anderson, C., & Winn, D. (2004). Violators of a child passenger safety law. *Pediatric*, *114*, 109-115. http://dx.doi.org/10.1542/peds.114.1.109

Albert. (2016). Omitted variable bias: A comprehensive econometrics review. Retrieved from https://www.albert.io/blog/omitted-variable-bias-econometrics-review/

Allen-Greil, D. (2015). What's the difference between social media and socialmarketing? Retrieved from http://smexchange.ogilvypr.com/2012/02/whats-the-difference-between-social-media-and-social-marketing/

American Academy of Pediatrics. (1999). The hospital record of the injured child and the need for external cause-of-injury codes. *Pediatrics*, *103*(2), 524-526. doi: 10.1542/peds.103.2.524

American College of Physicians (2014). What is statistical power? Retrieved from https://effectsizefaq.com/2010/05/31/what-is-statistical-power/

American Psychological Association. (2016). Journal article selection criteria. Retrieved from http://www.apa.org/pubs/databases/psycinfo/publishers/journal-article.aspx

American Public University System. (2009). Online library: What does peer reviewed mean? Retrieved from http://apus.libanswers.com/a.php?qid=5312

Antioch University. (2014). Research tips. Retrieved from http://www.antiochne.edu/library/researchassist/

Babbie, E. (2004). *The practice of social research* (10th ed.). Belmont, CA: Wadsworth.

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, *31*(143), 1-23. doi:10.1177/1090198104263660

Bartholomew, L. (2001). *Intervention mapping: Designing theory and evidence-based health promotion programs*. Mountain View, CA: Mayfield Publishing Company.

BenefitOf.net. (2014). Benefit of SPSS. Retrieved from http://benefitof.net/benefits- of-spss/

Biagioli, F. (2004). Educating Oregon families about child safety seats. *Californian Journal of Health Promotion*, *2*(Special Issue), 55-8. Retrieved from http://cjhp.fullerton.edu/Volume2_2004/SpIssOregon/55-58-biagioli.pdf

Brixey, S., & Guse, C. (2009). Knowledge and behaviors of physicians and caregivers about appropriate child passenger restraint use. *Journal of Community Health*, *34*(6), 547-52. doi: 10.1007/s10900-009-9176-2

Bryant-Stephens, T., Garcia-Espana, J., & Winston, F. (2013). Boosting restraint norms: A community-delivered campaign to promote booster seat use. *Traffic Injury Prevention*, *14*(6), 578-83. doi: 10.1080/15389588.2012.733840

Burns, E. (2012). Health care and social media benefits: Improving patient engagement in 2013. Retrieved from http://searchhealthit.techtarget.com/news/2240175206/Health-care-and-social-media-benefits-Improving-patient-engagement-in-2013

Centers for Disease Control and Prevention. (2004a). Division of public health surveillance and informatics: Home. Retrieved from http://www.cdc.gov/ophss/csels/dhis/index.html

Centers for Disease Control and Prevention. (2004b). Framework for evaluating public health surveillance systems for early detection of disease outbreaks: Morbidity and Mortality Weekly Report. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5305a1.htm

Centers for Disease Control and Prevention. (2006). Injury fact book: A risk at any stage of life. Retrieved from http://www.cdc.gov/Injury/publications/FactBook/Injury%E2%80%94A_Risk_at_Any_Stage_of_Life2006-a.pdf

Centers for Disease Control and Prevention. (2009). Georgia: Injury deaths among children 0 to 19 years of age. Retrieved from http://www.cdc.gov/safechild/states/ga.html

Centers for Disease Control and Prevention. (2011a). Georgia: Cost of death from motor vehicle crashes. Retrieved from http://www.cdc.gov/Motorvehiclesafety/statecosts/ga.html

Centers for Disease Control and Prevention. (201lb). Risk communication. Retrieved from http://www.cdc.gov/healthcommunication/Risks/index.html

Centers for Disease Control and Prevention. (2011c). What is health communications? Retrieved from http://www.cdc.gov/HealthCommunication/HealthBasics/WhatIsHC.html

Centers for Disease Control and Prevention. (2013). Social ecological model. Retrieved from http://www.cdc.gov/cancer/crccp/sem.htm

Centers for Disease Control and Prevention. (2014a). Child passenger safety: Get the facts. Retrieved from http://www.cdc.gov/MotorVehicleSafety/Child_Passenger_Safety/CPS-Factsheet.html

Centers for Disease Control and Prevention. (2014b). Social media at CDC. Retrieved from http://www.cdc.gov/socialmedia/index.html

Centers for Disease Control and Prevention. (2014c). The social-ecological model: A framework for prevention. Retrieved from http://www.cdc.gov/ViolencePrevention/overview/social-ecologicalmodel.html

Centers for Disease Control and Prevention. (2014d). Wonder. Retrieved from http://wonder.cdc.gov/

Centers for Disease Control and Prevention. (2015). National center for injury prevention and control. Retrieved from http://www.cdc.gov/injury/index.html

Children's Healthcare of Atlanta. (2014). About us. Retrieved from http://choa.org/

Children's Healthcare of Atlanta. (2015). Child passenger safety restraint law in Georgia. Retrieved from http://www.choa.org/boosterseat

Consumer Product Safety Commission. (2014). National electronic injury surveillance System: CPCS Document #3002. Retrieved from http://www.cpsc.gov/en/Safety-Education/Safety-Guides/General-Information/National-Electronic-Injury-Surveillance-System-NEISS/

Creative Research Systems. (2012). Sample size calculator. Retrieved from http://www.surveysystem.com/sscalc.htm

Creswell, J. (2003). *Research design* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Curtis, L.M., Wolf, M.S., Weiss, K.B., & Grammer, L.C. (2012). The impact of health literacy and socioeconomic status on asthma disparities. *Journal of Asthma*, *49*(2):178-83. https://doi.org/10.3109/02770903.2011.648297

Dictionary.com. (2012). Multidisciplinary. Retrieved from http://dictionary.reference.com/browse/Multidisciplinary

Diehr, P., Hannon, P., Pizacani, B., Forehand, M., Meischke, H., Curry, S., Martin, D.P., Weaver, M.R., & Harris, J. (2011). Social marketing, stages of change, and public health smoking interventions. *Health Education and Behavior, 38*(2):123-131. https://doi.org/10.1177/1090198110369056

Dissertation India. (2011). Determining sample size for conducting research. Retrieved from http://www.dissertationindia.com/determining-sample-size.html

Drive Safely. (2015). Child safety seat laws. Retrieved from https://www.idrivesafely.com/blog/child-safety-seat-laws/

Durbin, D.R., Curry, A., & Myers, R. (2011). Development of a US child-focused motor vehicle crash surveillance system: A pilot study. *Annals of Advances in Automotive Medicine*, *55,* 33-40. Retrieved from https://www.scopus.com/record/display.uri?eid=2-s2.0-84055199738&origin=inward&txGid=d3f8463cc63ed39c9bc6c3473eea2e43

East Carolina University Department of Psychology. (2016). Estimating the sample size necessary to have enough power. Retrieved from http://core.ecu.edu/psyc/wuenschk/StatsLessons.htm

EHow. (2014). Technology based communication tools. Retrieved from http://www.ehow.com/list_7424858_technology-based-communication-tools.html

Emery, K., Hawkes, A., Cassabaum, V., & Rapstine, T. (2010). Junglemobile: A mobile injury-prevention program for young children. *Journal of Trauma Nursing*, *17*(1), 19-27. doi: 10.1097/JTN.0b013e3181d91605

Ernstberger, A., Joeris, A., Daigi, M., Kiss, M., Angerpointner, K., & Schmucker, U. (2015). Decrease of morbidity in road traffic accidents in a high-income country: An analysis of 24, 405 accidents in a 21 year period. *Injury*, S135-S143. doi: 10.1016/S0020-1383(15)30033-4

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). London: Sage.

Frankfort-Nachmias, C. & Nachmias, D. (2008). *Research methods in the social sciences* (7th ed.). New York: Worth.

Freudenburg, W. (1982). Course outline: Social impact assessment. *Impact Assessment Bulletin, 1*(2), 100-105. Retrieved from https://www.researchgate.net/publication/254450911_Publications_of_William_R_Freudenburg_Books_articles_and_book_chapters

Frost, R., Zuckerman, E., & Zuckerman, M. (2008). Health promotion theories and models for program planning and implementation. College of Public Health, University of Arizona. Retrieved from azrapeprevention.org/sites/azrapeprevention.org/files/2008_01_UA.pdf

Fulton County Georgia Government. (2011). Safe kids. Retrieved from http://www.fultoncountyga.gov/component/content/article/408-population-health/3624-safe-kids/

Georgia Department of Community Affairs. (2014). Fulton County. Retrieved from http://www.dca.state.ga.us/CountySnapshotsNet/countysnapshot.aspx?cicoid=1060060

Georgia Governor's Office of Highway Safety. (2014a). Child passenger safety. Retrieved from http://www.gahighwaysafety.org/research/child-passenger-safety/

Georgia Governor's Office of Highway Safety. (2014b). Crash injuries. Retrieved from http://www.gahighwaysafety.org/research/crash-njuries/

Georgia Governor's Office of Highway Safety. (2014c). Georgia crashes, injuries & fatalities statistics. Retrieved from http://www.gahighwaysafety.org/research/ga-crashes/injuries/fatalities/

Georgia Governor's Office of Highway Safety. (2014d). Georgia highway safety statistics. Retrieved from http://www.gahighwaysafety.org/research/

Georgia Governor's Office of Highway Safety. (2014e). Georgia's seat belt laws. Retrieved from http://www.gahighwaysafety.org/seat-belt-laws/

Georgia Governor's Office of Highway Safety. (2015). *Fact Book*. Georgia Governor's Office of Highway Safety.

Glanz, K., Rimer, B., & Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice*. San Francisco, CA: Jossey-Bass Publications.

Glassbrenner, D. (2003). Child restraint use in 2002: Results from the 2002 NOPUS controlled intersection study. *National Center for Statistics & Analysis*, 1-22. Retrieved from https://www.nhtsa.gov/research-data

Glassbrenner, D. (2005). *Child restraint use in 2004-overall results* (DOT Publication. No. HS 809 845, 1-8). U.S. Department of Transportation/National Center for Statistics and Analysis. Retrieved from https://www.nhtsa.gov/research-data

Grossman, D.C. (2000). (Electronic version). The History of injury control and the epidemiology of child and adolescent injuries. *Future Child, Spring-Summer 10*(1), 23-52. doi: 10.2307/1602824

Harrison, S. & Mort, M. (1998). Which champions, which people? Public and user involvement in health care as a technology of legitimation, *Social Policy Administration*, *32*(1), 60-70. https://doi.org/10.1111/1467-9515.00086

Huff, R. & Kline, M. (1999). *Promoting health in multicultural populations: A handbook for practitioners*. Thousand Oaks, CA: Sage Publications.

Huniqian, L., Jingzhen, Y., Xiangxiang, L., Xiaojun, C., & Liping, L. (2016). Has child restraint system use increased among parents of children in Shantou, China? *International Journal of Environmental Research and Public Health*, *13*(964), 1-8. Retrieved from https://www.mdpi.com/journal/ijerph

Hutton, J.L. (2001). Are distinctive ethical principles required for cluster randomized controlled trials? *Statistics in Medicine,15;20*(3), 473-488. https://doi.org/10.1002/1097-0258(20010215)20:3<473::AID-SIM805>3.0.CO;2-D

IBM. (n.d.). SPSS software. Retrieved from http://www-01.ibm.com/software/analytics/spss

Ijaz, K. (2004). Description and selection of research study designs for use in research study designs: C-4 Residency. Walden University.

Injury Free Coalition for Kids. (2016). Injury free coalition for kids. Retrieved from http://injuryfree.org/

Injury Free Coalition for Kids Atlanta. (2016). Injury free coalition for kids Atlanta. Retrieved from http://injuryfree.org/site_display.cfm?PermanentId=592EF206-F57D-4AD8-9AC387C6565CA15F

Institute for Digital Research and Education. (2015). *What does Cronbach's alpha mean*? Retrieved from https://stats.idre.ucla.edu/spss/faq/what-does-cronbachs-alpha-mean/

Journal of Extension. (1999). Cronbach's Alpha: A tool for assessing the reliability of scales. Retrieved from http://www.joe.org/joe/1999april/tt3.php

Keay, L., Hunter, K., Brown, J., Simpson, J.M., Bliston, L.E., Elliot, M., Stevenson, M., & Ivers, R.Q. (2012). Evaluation of an education, restraint distribution, and fitting program to promote correct use of age-appropriate child restraints for children aged 3 to5 years: A cluster randomized trial. *American Journal of Public Health. 102*(12): e96-e103. Retrieved from https://www.apha.org/publications-and-periodicals/american-journal-of-public-health

Kidd, D.G. & McCartt, A.T. (2013). (Electronic version). Drivers' attitudes toward front or rear child passenger belt use and seat belt reminders at these seating positions. *Traffic Injury Prevention, 15*(3). P. 278-86. doi: 10.1080/15389588.2013.810333

Kreuter, M.W., Lezin, N.A. & Green, L.W. (1997). *Community health promotion ideas that Work: A field book for practitioners*. Sudbury MA: Jones and Bartlett Publishers.

Laerd Statistics. (2018). Multiple regression analysis using SPSS statistics. Retrieved from https://statistics.laerd.com/spss-tutorials/multiple-regression-using-spss-statistics.php

Laerd Statistics. (2012a). Non-probability sampling. Retrieved from http://dissertation.laerd.com/non-probability-sampling.php

Laerd Statistics. (2012b). Probability sampling. Retrieved from http://dissertation.laerd.com/probability-sampling.php

Laerd Statistics. (2012c). Purposeful sampling. Retrieved from http://dissertation.laerd.com/purposive-sampling.php

Laerd Statistics. (2012d). Quota sampling. Retrieved from http://dissertation.laerd.com/quota-sampling.php

Laerd Statistics. (2012e). Simple random sampling. Retrieved from http://dissertation.laerd.com/simple-random-sampling.php

Laerd Statistics. (2012f). Stratified random sampling. Retrieved from http://dissertation.laerd.com/stratified-random-sampling.php

Laerd Statistics. (2012g). Systematic random sampling. Retrieved from http://dissertation.laerd.com/systematic-random-sampling.php

Laerd Statistics. (2013*).* Cronbach's Alpha (α) using SPSS. Retrieved from https://statistics.laerd.com/spss-tutorials/cronbachs-alpha-using-spss-statistics.php

Laureate Education (Executive Producer). (2010). *Doctoral research: Interviewing techniques, part I*. Baltimore, MD

Laureate Education (Executive Producer). (2011). *Introduction to communications, marketing, and public relations for public health leaders*. Baltimore, MD

Learn Higher. (2008). Analyse this: Advantages and disadvantages of quantitative data analysis. Retrieved from http://archive.learnhigher.ac.uk/analysethis/mobile/main/quantitative1.html

McKenzie, L., Fowler, E., Roberts, K., & Kaercher, R. (2016). Child passenger safety in Somaii communities of Columbus. *Journal of Community Health*. doi: 10.1007/s10900-016-0246-y

Media News Today. (2014). Social media: how does it really affect our mental health and well-being? Retrieved from http://www.medicalnewstoday.com/articles/275361.php

Meharry Medical College. (2004). Reducing unintentional injuries on the nation's highways: research and program policy to increase seat belt use. *Meharry Medical College's Center for Community Base Research, 173*, 1890. Retrieved from https://home.mmc.edu/research/office-for-research/clinical-research/

Meharry-State Farm Alliance. (2005). National highway traffic safety administration. Retrieved from http://www.meharry.org/ms/Safety_Organization/Governmnet_Based/NHTSA.html

Merriam-Webster. (2014). Literacy. Retrieved from http://www.merriam-webster.com/dictionary/literacy

Mirman, J., Seifert, S.J., Zonfillo, M.R., Metzger, K., Durbin, D.R., & Arbogast, K.B. (2015). Evaluating the effect of a mechanical adjunct to improve the installation if child restraint systems to vehicles. *Traffic Injury Prevention*, *16*, S24-S31. doi: 10.1080/15389588.2015.1069821

Muller, V.M., Burke, R.V., Arbogast, H., Ruiz, P.C., Nunez, N.M., San Mateo, K. R., Cazzulino, F., & Upperman, J.S. (2014). Evaluation of a child passenger safety class in increasing parental knowledge. *Accident Analysis and Prevention*, *63*, 37-40. https://doi.org/10.1016/j.aap.2013.10.021

National Business Research Institute. (2017). Validity of your survey results. Retrieved from https://www.nbrii.com/our-process/validity/

National Center for Statistics & Analysis-Traffic Safety Facts. (2005a). *Children* (DOT Publication, No. HS 809 762). Washington, DC: U.S. Department of Transportation Printing Office. Retrieved from https://mcs.nhtsa.gov/index.cfm?category=28

National Center for Statistics & Analysis-Traffic Safety Facts. (2005b). *Pedestrians* (DOT Publication, No. HS 809 769). Washington, DC: U.S. Department of Transportation Printing Office. Retrieved from https://mcs.nhtsa.gov/index.cfm?category=28

National Child Passenger Safety Certification. (2013). National child passenger safety certification. Retrieved from http://cert.safekids.org/

National Institutes of Health (n.d.). National Cancer Institute. Retrieved from http://www.cancer.gov/

National Institutes of Health. (2013). Clear communication. Retrieved from http://nih.gov/clearcommunication/

National Institutes of Health. (2015). Community-based participatory research. Retrieved from http://obssr.od.nih.gov/scientific_areas/methodology/community_based_participatory_research/index.aspx

National Institutes of Health. (2018). National Cancer Institute Overview and Mission. Retrieved from https://www.cancer.gov/about-nci/overview#how-nci-leads

National Safe Kids Campaign. (2014). Childhood injuries. Retrieved from http://www.safekids.org

National Safe Kids Campaign. (2019). What we do. Retrieved from https://www.safekids.org/what-we-do

Nelson, G. & Moffit, P. (1988). Safety belt promotion: Theory and practice. *Accident Analysis & Prevention*, *20*(1), 27–38. https://doi.org/10.1016/0001-4575(88)90012-7

NeuroCom. (2012). Setting the standard in balance and mobility. Retrieved from http://www.resourcesonbalance.com/program/management/MultidisciplinaryApproach.aspx

New Georgia Encyclopedia. (2014). Fulton County. Retrieved from http://www.georgiaencyclopedia.org/articles/counties-cities-neighborhoods/fulton-county

New Hanover Regional Medical Center. (2019). IRB purpose. Retrieved from https://www.nhrmc.org/healthcare-professionals/research/institutional-review-board/irb-purpose

Nilsen, P. (2006). The theory of community-based health and safety programs: A critical examination. *Injury Prevention, 12*(3): 140–145. https://dx.doi.org/10.1136%2Fip.2005.011239

North Central Regional Educational Laboratory. (n.d.). Chapter 2: Conducting a community needs assessment. Retrieved from http://www.strengtheningnonprofits.org/resources/e-learning/online/communityassessment/Print.aspx

Northside Hospital. (2016). About us. Retrieved from http://www.northside.com/aboutus

Nova Southeastern University. (2019a). Institutional Review Board. Retrieved from https://www.nova.edu/irb/index.html

Nova Southeastern University. (2019b). Research and Scholarly Work. Retrieved from https://cec.nova.edu/research/irb.html

Oak Ridge Institute for Science and Education. (n.d.). CDCynergy. Retrieved from http://www.orau.gov/cdcynergy/

O'Carroll, P.W., Yasnoff, W.A., Ward, M.E., Ripp, L.H., & Martin, E.L. (2003). *Public health informatics and information systems.* New York: Springer Verlag

O'neil, J., Rouse, T.M., Hackworth, J., Howard, M. & Daniels, D. (2012). Seat belt misuse by a child transported in belt-positioning booster seat with deadly consequences. *Journal of Trauma Nursing*, *19*(4). 246-50. doi: 10.1097/JTN.0b013e3182776e1a.

Online Analytical Statistics Information Systems. (2014). Mortality/morbidity web query tool. Retrieved from http://www.oasis.state.ga.us/oasis/oasis/qryMorbMort.aspx

Paavola, J.C. (1995). Health services in the schools: Building interdisciplinary partnerships. *Eric Publications*, 1-6. Retrieved from https://www.ericdigests.org/1996-3/health.htm

Palliative Care Curriculum for Undergraduate Students. (2014). Activity 1: What is a multidisciplinary approach to care? Retrieved from http://www.pcc4u.org/learning-modules/focus-topics/topic-1-multidisciplinary-care/1-principles-of-a-multidisciplinary-approach/activity-1-what-is-a-multidisciplinary-approach-to-care

Parker, J. C., & Thorson, E. (Eds.). (2009). *Health communication in the new media landscape*. New York, NY: Springer Publishing Company.

Polli, J. and Polli I. (2015). Traveling with children: Beyond car seat safety. *Journal de Pediatria, 91*(6), 515-522. https://doi.org/10.1016/j.jped.2015.05.002

Power and Precision. (2016). What is power analysis? Power analysis. Retrieved from http://www.poweranalysis.com/power_analysis.htm

September 27, 2014, from http://www.citizen.org/pressroom/release.cfm?ID=1090

Psych Unlimited. (n.d.). Power analysis for correlation & multiple regression. Retrieved from https://psych.unl.edu/psycrs/942/q1/mrpower.pdf

Research Design Review. (2012). A discussion of qualitative and quantitative design issues: Interviewer bias & reflexivity in qualitative research. Retrieved from http://researchdesignreview.com/2012/11/14/interviewer-bias-reflexivity-in-qualitative-research/

Research Methods Knowledge Base. (2006). Scaling. Retrieved from http://www.socialresearchmethods.net/kb/scaling.php

Rimala, R. & Lapinski, M. (2009). Why health communication is important in public health. *Bull World Health Organ; 87*, 247. Retrieved from www.who.int/bulletin/volumes/87/4/08-056713.pdf

Riverside Community Health Foundation. (n.d.). Theories and models frequently used in health promotion. Retrieved from http://www.cdc.gov/nccdphp/dnpa/physical/handbook/pdf/handbook.pdf

Runyan, C. (2004). *Evaluating injury prevention programs*. University of North Carolina: Johns Hopkins Summer Institute.

Russell, A., Voas, R., Dejong, W., & Chaloupka, M. (1995). MADD rates the states: A media advocacy event to advance the agenda against alcohol-impaired driving. *Public Health Reports, 110*(3), 240-245. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1382113/

Ryan, S. & Rigby, P. (2007). Toward development of effective custom child restraint systems in motor vehicles. *Proceedings of the Canadian Seating and Mobility Conference*, (pp. 250–56), Toronto: CASMA Press. Retrieved from http://www.csmc.ca/

Safe Kids Fulton County. (2010). *Safe Kids Worldwide community needs assessment for existing coalitions*. Safe Kids Fulton County.

Safe Kids Georgia. (2014). Fulton County. Retrieved from http://safekidsgeorgia.org/fulton/

Safe Kids Worldwide. (2014a). Partner with us. Retrieved from http://www.safekids.org/partner-us

Safe Kids Worldwide. (2014b). Who we are. Retrieved from http://www.safekids.org/

Safe Kids Worldwide. (2015). Child safety seat law tracker. Retrieved from http://www.safekids.org/statelaws

Scibd. (2014). Instruments in quantitative research. Retrieved from http://www.scribd.com/doc/51917268/Instruments-in-Quantitative-Research

Sci.Nova.edu. (n.d.). IRB process overview. Retrieved from http://www.scis.nova.edu/~cannady/IRB_Info.htm

Simon, M. (2011). (Electronic version). *Recipes for success: Assumptions, limitations, and delimitations*. Seattle, WA, Dissertation Success, LLC

Simply Psychology. (2008). Qualitative quantitative. Retrieved from http://www.simplypsychology.org/qualitative-quantitative.html

Sinclair, M. (2007). A guide to understanding theoretical and conceptual frameworks. *Evidence Based Midwifery, 5*(2): 39. Retrieved from https://docobook.com/a-guide-to-understanding-theoretical-and-conceptual-framewor.html

Social Design Notes. (2004). What is asset mapping? Retrieved from http://backspace.com/notes/2004/06/what-is-asset-mapping.php

Starnes, M. (2003). *The relationship between driver and child passenger restraint use among infants and toddlers* (DOT Publication, No. HS 809 559, 1-4). U.S. Department of Transportation/National Center for Statistics and Analysis.

StatPac. (2017). Survey design guidelines. Retrieved from https://www.statpac.com/survey-design-guidelines.htm

Staunton, C., Davidson, S., Kegler, S., Dawson, L., Powell, K., & Dellinger, A. (2005). Critical gaps in child passenger safety practices, surveillance, and legislation: Georgia, 2001. *Pediatrics, 115*(2 Part 1), 372-9. Retrieved from https://reference.medscape.com/medline/abstract/15687447

Stone, D. H., Morrison, A., & Smith, G.S. (1999). Emergency department injury surveillance systems: the best use of limited resources. *Injury Prevention, 5,* 166-167. Retrieved from https://injuryprevention.bmj.com/content/injuryprev/5/3/166.full.pdf

Substance Abuse and Mental Health Services Administration. (2003). *Too smart to start implementation guide*. Rockville, MD. Center for Substance Prevention.

Svenkerud, P. & Singhal, A. (1998). Enhancing the effectiveness of HIV/AIDS prevention programs targeted to unique population groups in Thailand: Lessons learned from applying concepts of diffusion of innovation and social marketing. *Journal of Health Communication*, *3*(3), 193-216. https://doi.org/10.1080/108107398127337

The Guide to Community Preventive Services. (2013). Use of safety belts: Primary (vs. Secondary) enforcement laws. Retrieved from http://www.thecommunityguide.org/mvoi/safetybelts/supportingmaterials/RRenforcementlaws.html

Thomas, J., Nelson, J., & Silverman, S. (n.d.). (Excerpt from Electronic Version). Explore four methods for collecting qualitative research. *Research Methods in Physical Activity* (6th edition) Retrieved from http://www.humankinetics.com/excerpts/excerpts/explore-four-methods-for-collecting-qualitative-research

Triola, M. F. (2004). *Essentials of statistics* (2nd ed.). New York: Addison Wesley & Benjamin Cummings

Trochim, W.M.K. (2006). Statistical power. Retrieved from http://www.socialresearchmethods.net/kb/power.php

UKEssays. (2014). Validity reliability quantitative. Retrieved from http://www.ukessays.com/essays/general-studies/validity-reliability-quantitative.php

United States Census Bureau. (n.d.). Fulton County Georgia. Retrieved from http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml

United States Census Bureau. (2014.). Fulton County Georgia. Retrieved from http://quickfacts.census.gov/qfd/states/13/13121.html

University of Missouri System and Lincoln University (University Outreach and Extension). (1999). Asset mapping. Retrieved from http://extension.missouri.edu/about/fy00-03/assetmapping.htm

University of Wisconsin-Madison. (2016). Power analysis. Retrieved from http://psych.wisc.edu/henriques/power.html

US Department of Health and Human Services. (2014). Quick guide to health literacy. Retrieved from http://www.health.gov/communication/literacy/quickguide/factsbasic.htm

US Department of Health and Human Services, Centers for Disease Control and Prevention. (2012). National action plan for child injury prevention. Retrieved from http://www.cdc.gov/safechild/pdf/National_Action_Plan_for_Child_Injury_Prevention.pdf

US Department of Health and Human Services, National Institute of Health. (2004). *Making health communication programs work* (Publication, No. *T068,* 04-5145). U.S. Department of Health and Human Services.

US Department of Health and Human Services, Public Health Services. (n.d.) *From data to action: Injury and child abuse* (Publication, CDC public health surveillance for women, infants, and children, 1-427). U.S. Department of Health and Human Services.

US DOT NHTSA. (2002). *Safe routes to school*. U.S. Department of Transportation & National Highway Traffic Safety Administration.

US DOT NHTSA. (2014). *US Department of Transportation unveils tools and campaign to increase car seat safety* (Publication, NHTSA*,* 38-14). U.S. Department of Transportation & National Highway Traffic Safety Administration.

US DOT NHTSA. (2015*). Occupant restraint use in 2013: Results from the national occupant protection use survey controlled intersection study*. U.S. Department of Transportation & National Highway Traffic Safety Administration.

Walden University. (2014a). Avoiding bias. Retrieved from http://writingcenter.waldenu.edu/774.htm

Walden University. (2014b). Library. Retrieved from http://library.waldenu.edu/

Walden University. (2014c). Scholarly writing. Retrieved from http://writingcenter.waldenu.edu/312.htm

Wallack, L., Dorfman, L., Jernigan, D., & Themba-Nixon, M. (1993). *Media advocacy and public health: power of prevention*. Newbury Park, CA: Sage Publications.

Weatherwax, M., Coddington, J., Ahmed, A., & Richards, E. (2015). Child passenger safety policy and guidelines: Why change is imperative. *Journal of Pediatric Health Care*, *30*(2), 160-4. doi: 10.1016/j.pedhc.2015.09.006

Xiangxiang, L., Jinghen, Y., Fuyuan, C., & Liping L. (2016). Newborn parent based intervention to increase child safety seat use. *International Journal of Environmental Research and Public Health*, *13*(777), 1-10. https://doi.org/10.3390/ijerph13080777

Yu, C. H. (n.d.). An introduction to computing and interpreting Cronbach Coefficient Alpha in SAS. Arizona State University, Tempe, AZ, *Statistics, Data Analysis, and Data Mining, 246-26*, 1-5. Retrieved from https://support.sas.com/resources/papers/proceedings/proceedings/sugi26/p246-26.pdf

Zonfrillo, M., Ferguson, R., & Walker, L. (2015). Reasons for child passenger non-restraint in motor vehicles. *Traffic Injury Prevention*, *16*, S41-S45. http://dx.doi.org/10.1080/15389588.2015.1040115

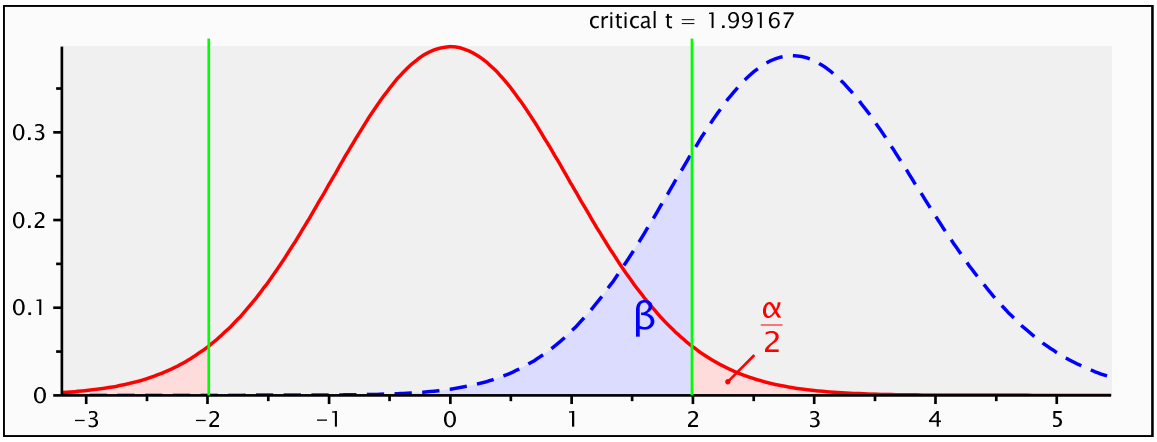
Zonfrillo, M., Sauber-Schatz, E., Hoffman, B., & Durbin, D. R. (2014). (Electronic version). Pediatricians' self-reported knowledge, attitudes, and practices about child passenger safety. *The Journal of Pediatrics*, *Sept 1*. https://doi.org/10.1016/j.jpeds.2014.07.041

Appendix A

Sample Size Tabulation

Table 1

Sample Size Tabulation



t tests – Linear multiple regression: Fixed model, single regression coefficient

Analysis:	A priori: Compute required sample size		
Input:	Tail(s)	=	Two
	Effect size f^2	=	0.10
	α err prob	=	0.05
	Power (1−β err prob)	=	0.80
	Number of predictors	=	4
Output:	Noncentrality parameter δ	=	2.8460499
	Critical t	=	1.9916726
	Df	=	76
	Total sample size	=	81
	Actual power	=	0.8023246

Appendix B

Fulton County, Georgia
Parents' Knowledge of CPS & CPS Use Survey
Child Passenger Safety

Date: _____

1. What was your age on your last birthday?
_____ < 14 _____ 21-29 _____ 50-59 _____ 15-17
_____ 30-39 _____ 60+ _____ 18-20 _____ 40-49
_____ No response

2. What is your sex? _____ Male _____ Female

3. What is your race/ethnicity?
_____ Asian _____ Hispanic
_____ White _____ African-American
_____ Other _____ Refused

4. What is the primary language(s) spoken in the child's home?
_____ English _____Spanish_____ Other

5. Check your highest level of education:
_____ Elementary (0-5) _____ Middle School (6-8)
_____ Some High School (9-12) _____High School Graduate/GED
_____ Some College _____ College graduate or beyond

6. What is your child or children's age(s) (that you currently transport)
_____0-1_____ 1-4 _____ 4-8
_____9-13 _____14-17 _____ 18-21
_____ 22+ _____ None _____ Expected parent

7. What is your relationship to this child?
_____Mother _____ Father
_____Grandmother _____ Grandfather
_____ Legal Guardian _____ Other (write in):

8. How often does your child(ren) ride in a car?
_____ Once a day or more _____ Almost every day
_____ A few times a week _____A few times a month
_____ Once a month or less

9. Where does your child(ren) typically sit in the car?
_____ Front passenger seat _____ Back side positions
_____Back center position _____ Do not transport child(ren)
_____ Do not know

10. What type of car to you use to transport your child(ren)?
_____ Sedan _____ Minivan/Van
_____ Sports Utility Vehicle _____ Pick-up Truck
_____ Public transportation _____ Do not know

11. How many people do you typically transport in the car?
_____ 0-1 _____2-4
_____ 5-7 _____ Do not know

12. Do you currently own a child passenger safety seat?
_____ Y _____ N _____Do not know

13. Do you currently use a child passenger safety seat?
_____ Y _____ N _____Do not know

14. How often does your child ride in a child passenger safety seat?
_____ Once a day or more _____ Almost every day
_____ A few times a week _____A few times a month
_____ Once a month or less

15. What type of child passenger safety to you current use (or have used in the past)?
_____ Infant car safety seat _____ Convertible car safety seat
_____ Booster safety seat _____ Combination safety seat
_____ Vehicle seat belt _____ Do not buckle my child(ren)

16. Do you know how to properly use a child passenger safety seat?
_____ Y _____ N _____Do not know

17. Tell us why your child may not ride in a child passenger safety seat all the time. (Please check all that may apply)
_____ a. Car seats are too expensive for me to buy one.
_____ b. I don't know what kind of car seat my child needs.
_____ c. My car or truck doesn't fit a car seat.
_____ d. I didn't think a car seat would make much difference in keeping my child safe. _____ e. I think my child will hate being in a car seat, or will cry.
_____ f. I want to be able to hold my baby in my lap in the car.
_____ g. There isn't enough room for all the kids to fit in the car in car seats.
_____ h. I thought my child was too big to need a car seat.
_____ i. My child rides in more than one car.
_____ j. My child doesn't ride in a car very often.
_____ k. I don't know how to put a car seat in my car right.
_____ l. I don't like the idea of restraining my child.
_____ m. I don't like not being able to see my child well when I am driving.
_____ n. A car seat doesn't work in my life; I take the bus or I get rides from people.
_____ o. Other (write in):

18. What forms of advertising do you think influence child passenger safety sat use?
_____ Television _____ Music _____ Bus signs _____ Magazines _____ Billboards _____ Internet advertisements _____ Social Media

19. Are you aware of the Georgia's current child passenger safety seat guidelines?
_____ Yes _____ No _____ Do not know

20. What do you think prevents society from properly using child passenger safety seats?
_____ Acceptance by society
_____Lack of awareness or knowledge of child passenger safety laws/guidelines
_____ Lack of awareness or knowledge of child passenger safety seat installation
_____ Lack of awareness or knowledge of child passenger safety seat advertisements
_____ Parental attitude _____ Lack of enforcement
_____ Other

21. Are there resources available in your community that address child passenger safety set issues? _____ Yes _____No

21A. If the response to the previous question was "Yes," then what resources are available? _____ Community-based prevention programs _____Law enforcement _____ School or hospital based prevention programs
_____Parent groups
_____Other _____Do not know

22. Would you favor new and/or stiffer penalties for persons who violate child passenger safety seat laws?
_____ Yes _____ No _____Do not know

23. Do you favor driver's license suspension or revocation for persons who violate child passenger safety seat laws over five times?
_____ Yes _____ No _____Do not know

24. What government agencies should be involved in solving this problem?
_____ Child advocates and agencies _____ Police departments
_____ Health & human service agencies _____ Courts
_____ School systems _____ Other

25. Select the possible solution(s) that would be effective to combat this issue in your community? _____ Child passenger safety seat education seminars
_____ Child passenger safety seat installation stations
_____ Stronger child passenger safety seat enforcement
_____ Stronger child passenger safety seat marketing and public awareness campaign

26. Are there programs in your community that address the child passenger safety seat issues
_____ Yes _____ No _____Do not know

26A. If the response to the previous question was "Yes," then what programs are available? _____ Community-based prevention programs _____Law enforcement _____ School or hospital based prevention programs
_____Parent groups
_____Other _____Do not know

Thank you very much for giving us your time. Your feedback has been most helpful.

Appendix C

Carseat Safety Pretest

1. Infant seats can ride_____.
    a. forward facing only
    b. rear facing only
    c. forward or rear facing

2. Children should ride in the back seat until age_____
    a. 10
    b. 11
    c. 12

3. Convertible seats can ride_____
    a. forward facing only
    b. rear facing
    c. forward or rear facing

4. Infant seats should never be placed in front of an airbag.
   True or false

5. The safest place in the car is the_____.
    a. front passenger seat
    b. back outboard seat behind driver
    c. center rear seat

6. The safest practice is to keep children in a booster seat until they are 4 foot 9 inches? True or False

7. The GA law requires children to ride in a safety seat until age____.
    a. 8
    b. 4
    c. 6

8. The latch system is safer than using seatbelts to install safety seats? True or False

9. Infants should ride rear facing until they are at least_____.
    a. 30 lbs
    b. 20lbs
    c. 20lbs and 1 year old

10. Fire fighters, policemen, and nurses are all trained to help you properly install car seats? True or False

11. Where should the harness clip be positioned on an infant or a child?
    a. at naval level
    b. at collar bone
    c. at armpit level

Thank you very much for giving us your time. Your feedback has been most helpful.

Appendix D

US Department of Health and Human Services

National Institutes of Health-National Cancer Institute

Planners Guide: Making Health Communication Programs Work

Intercept Questionnaire

Note to researcher/child passenger safety technician: Repeat questions 5–10 for both advertisements. Ask questions 11–16 after questions have been answered for the last advertisement.

"Now I am going to show you ideas for two advertisements and ask you a few questions about each. As with the previous survey, your participation is voluntary and your response is confidential".

Storyboard Sequence: Advertisement A, Advertisement B

5. Which of the following would describe your general reaction to this ad?

a. Do you really like it?..... ❑

b. Do you think it is just ok? ..... ❑

c. Do you not like it very much?..... ❑

d. Do you not like it at all?..... ❑

e. Don't know/refused ..... ❑

6. What is the main message of this ad? (Do not prompt)

_____

7. Does this advertisement motivate you to do anything? If so, what does it motivate you to do? (Do not prompt)

_____

If not, why not? (Do not prompt)

_____

8. If you saw this advertisement on television, how likely do you think you would be to consider the information?

a. Very likely . . . . . ❑

b. Somewhat likely . . . . . ❑

c. Not too likely . . . . . ❑

d. Don't know/refused . . . . . ❑

9. How well does each of the following words/attributes describe what you just saw?

a. Is it attention-getting?

Very much A little Not at all

b. Is it interesting?

Very much A little Not at all

c. Is it direct/to the point?

Very much A little Not at all

d. Is it useful information?

Very much A little Not at all

10. Was there anything in the advertisement that you found confusing or hard to understand? (Do not prompt—check all that apply)

a. Nothing . . . . . ❑

b. Confused in general . . . . . ❑

c. Message not clear . . . . . ❑

d. Words were hard to understand . . . . . ❑

e. Too much information presented . . . . . ❑

f. Message didn't relate to me . . . . . ❑

g. Other _____

Note to researcher/child passenger safety technician: Ask the following questions after showing both advertisements.

11a. Which advertisement do you like the best?

A . . . . . ❑

B . . . . . ❑

Why? _____

11b. Which advertisement do you like the least?

A . . . . . ❑

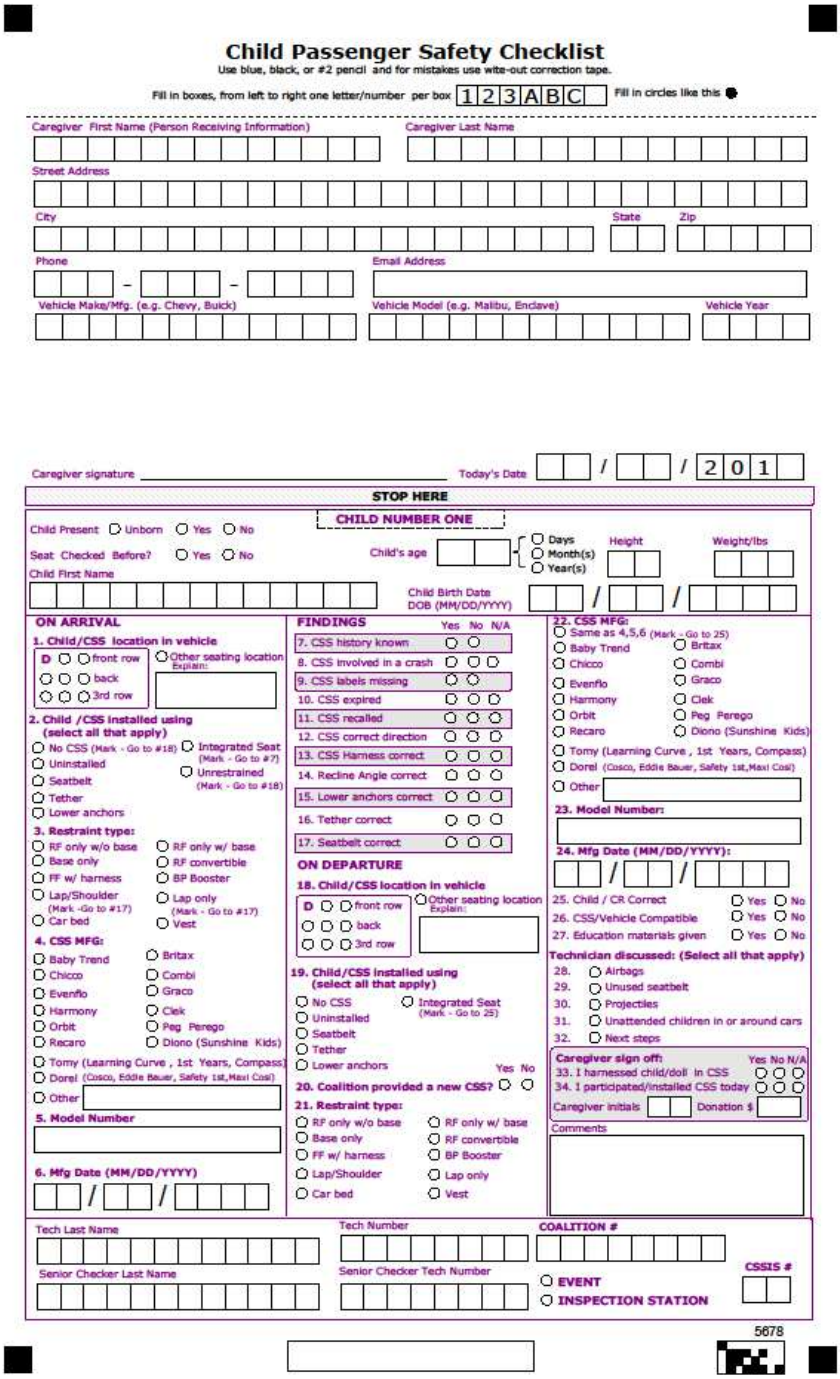
B . . . . . ❑

Why? _____

Thank you very much for giving us your time. Your feedback has been most helpful.

Appendix E

Child Passenger Safety Checklist



Child Passenger Safety Checklist

Use blue, black, or #2 pencil and for mistakes use wite-out correction tape.

Fill in boxes, from left to right one letter/number per box 1 2 3 A B C Fill in circles like this ●

Caregiver First Name (Person Receiving Information) Caregiver Last Name

Street Address

City State Zip

Phone Email Address

Vehicle Make/Mfg. (e.g. Chevy, Buick) Vehicle Model (e.g. Malibu, Enclave) Vehicle Year

Caregiver signature _____ Today's Date / / 2 0 1

STOP HERE

CHILD NUMBER ONE

Child Present ○ Unborn ○ Yes ○ No

Seat Checked Before? ○ Yes ○ No

Child's age ○ Days ○ Month(s) ○ Year(s) Height Weight/lbs

Child First Name

Child Birth Date DOB (MM/DD/YYYY) / /

ON ARRIVAL

1. Child/CSS location in vehicle

D ○ ○ front row ○ ○ ○ back ○ ○ ○ 3rd row ○ Other seating location Explain:

2. Child /CSS installed using (select all that apply)

○ No CSS (Mark - Go to #18) ○ Integrated Seat (Mark - Go to #7)
○ Uninstalled ○ Unrestrained (Mark - Go to #18)
○ Seatbelt
○ Tether
○ Lower anchors

3. Restraint type:

○ RF only w/o base ○ RF only w/ base
○ Base only ○ RF convertible
○ FF w/ harness ○ BP Booster
○ Lap/Shoulder (Mark -Go to #17) ○ Lap only (Mark - Go to #17)
○ Car bed ○ Vest

4. CSS MFG:

○ Baby Trend ○ Britax
○ Chicco ○ Combi
○ Evenflo ○ Graco
○ Harmony ○ Clek
○ Orbit ○ Peg Perego
○ Recaro ○ Diono (Sunshine Kids)
○ Tomy (Learning Curve , 1st Years, Compass)
○ Dorel (Cosco, Eddie Bauer, Safety 1st,Maxi Cosi)
○ Other

5. Model Number

6. Mfg Date (MM/DD/YYYY) / /

FINDINGS

	Yes	No	N/A
7. CSS history known	○	○	
8. CSS involved in a crash	○	○	○
9. CSS labels missing	○	○	
10. CSS expired	○	○	○
11. CSS recalled	○	○	○
12. CSS correct direction	○	○	○
13. CSS Harness correct	○	○	○
14. Recline Angle correct	○	○	○
15. Lower anchors correct	○	○	○
16. Tether correct	○	○	○
17. Seatbelt correct	○	○	○

ON DEPARTURE

18. Child/CSS location in vehicle

D ○ ○ front row ○ ○ ○ back ○ ○ ○ 3rd row ○ Other seating location Explain:

19. Child/CSS installed using (select all that apply)

○ No CSS ○ Integrated Seat (Mark - Go to 25)
○ Uninstalled
○ Seatbelt
○ Tether
○ Lower anchors

	Yes	No
20. Coalition provided a new CSS?	○	○

21. Restraint type:

○ RF only w/o base ○ RF only w/ base
○ Base only ○ RF convertible
○ FF w/ harness ○ BP Booster
○ Lap/Shoulder ○ Lap only
○ Car bed ○ Vest

22. CSS MFG:

○ Same as 4,5,6 (Mark - Go to 25)
○ Baby Trend ○ Britax
○ Chicco ○ Combi
○ Evenflo ○ Graco
○ Harmony ○ Clek
○ Orbit ○ Peg Perego
○ Recaro ○ Diono (Sunshine Kids)
○ Tomy (Learning Curve , 1st Years, Compass)
○ Dorel (Cosco, Eddie Bauer, Safety 1st,Maxi Cosi)
○ Other

23. Model Number:

24. Mfg Date (MM/DD/YYYY): / /

	Yes	No
25. Child / CR Correct	○	○
26. CSS/Vehicle Compatible	○	○
27. Education materials given	○	○

Technician discussed: (Select all that apply)

28. ○ Airbags
29. ○ Unused seatbelt
30. ○ Projectiles
31. ○ Unattended children in or around cars
32. ○ Next steps

Caregiver sign off:	Yes	No	N/A
33. I harnessed child/doll in CSS	○	○	○
34. I participated/installed CSS today	○	○	○

Caregiver initials Donation $

Comments

Tech Last Name Tech Number COALITION #

Senior Checker Last Name Senior Checker Tech Number CSSIS #

○ EVENT
○ INSPECTION STATION

5678