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Describing the Buckle Up Program Efforts to Support Child Well-being in Oklahoma: Exploring Potential Connections Between Child Motor Vehicle Injuries, Fatalities, Certification Status, and Buckle Up Events

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DEDICATION

This thesis is lovingly dedicated to my children, Aiden, Emma, Thomas, and Hunter, who inspire me daily to love selflessly, dream big, and work hard. Thank you for your love, your patience, and your acts of support during this time in my life. This thesis is also dedicated to my husband, Trey, for rallying behind me during the writing process and constantly encouraging me to continue.

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ABSTRACT

In 1997 Safe Kids Worldwide and General Motors Corporation founded the Buckle Up program. The program trains and certifies individuals to become service providers whose job is to obtain the knowledge and skills on the proper techniques to install safety seats for children, and how to share that knowledge with families. Buckle Up is an important program since the leading cause of death among children ages 2 to 14 is in a motor vehicle crash.

Trainings, car seat checkup events, and advocacy influence the way the environment affects child passenger safety. Advocacy opens the doors for strengthening the need to update laws since motor vehicle crashes continue to lead as a primary cause of death in children. The research will take a descriptive approach to review and compile available data to determine any associations between the Buckle Up program and the number of injuries and fatalities in Oklahoma between 2007 and 2011. Research will also utilize Urie Bronfenbrenner's Human Ecology Theory to examine how the Buckle Up program has been involved in the environment.

Data were collected and reviewed by a Child Passenger Safety Technician and Instructor, active in the field since 2007. The analysis was made from a non-biased perspective with interest in understanding how educational efforts were contributing to the Oklahoma child occupant outcomes.

CHAPTER ONE: INTRODUCTION

"If a disease were killing our children in the proportions that injuries are, people would be outraged and demand that this killer be stopped."

--C. Everett Koop, the former Surgeon General of the United States

In 1997, Safe Kids Worldwide implemented a new program to enhance the protection of children during vehicle transport. Safe Kids partnered with General Motors and the General Motors Corporation to host child safety seat checks at dealerships. The mission became known as the Buckle Up program. Throughout the years, the program has grown and expanded. Seat checks are no longer solely hosted at dealerships, but at any venue that will welcome the event. The focus is also not solely on keeping kids safe in cars by the use of properly installed child safety seats, but also focused on heatstroke awareness prevention, frontovers and backovers prevention, and preparing young teens on how to drive safely.

According to analysis reports from the National Highway Traffic Safety Administration, in 1996, an average of 8 children 0-14 years old were killed and 980 were injured every day in motor vehicle crashes in the United States (National Highway Traffic Safety Administration, 1997). Safe Kids Worldwide (2013) reports that since the commencement of the Buckle Up program fatalities have been reduced by one third and injuries have been cut in half. Not only have injuries and fatalities been reduced, but there have been more than 80,000 car seat checkup events hosted through the Buckle Up program and 1.6 million seats checked by a Certified Child Passenger Safety Technician (Safe Kids Worldwide, 2013).

Safe Kids Worldwide (2013) reported that 550,000 car seats had been distributed at little or no cost to at-risk families, and 22 million people had been exposed to the Buckle Up program both directly and in-directly. The National Association for the Advancement of Colored People and the National Council of La Raza were contributors to these previous numbers (Safe Kids

Worldwide, 2013). While this data has shown a potential connection to lives saved since the Buckle Up program commenced, these numbers do not prove that the program is the cause of this reduction. Further investigation is needed to more fully conceptualize this link.

Through the partnership with General Motors, Safe Kids coalitions throughout the United States have been able to host a total of 8,000 child safety seat checks each year (Safe Kids Worldwide, 2013). In 2000, General Motors also began donating vans to local Safe Kids coalitions. These vans allow for coalitions to pack seats and other safety equipment needed to host a Buckle Up event and travel to families in rural communities who are in need of education and seats. The last donation of vans was made in 2009. The total number of vans donated between 2000 and 2009 totals 137 (Safe Kids Worldwide, 2013).

The Census Bureau (2013) reports that Oklahoma is the 28th largest state population in the United States. In 1990, Oklahoma was composed of 3,450,654 persons. In 2000, the state was composed of 3,145,585 persons. In 2012, Oklahoma hosted 3,814,820 persons (Census Bureau). These data indicate that the Oklahoma population continues to grow, thus, creating the potential to produce more motor vehicle traffic on roadways. The Buckle Up program seeks to reach and educate motorists who transport children so that every single person in the vehicle is riding safely during transportation. The Buckle Up program continues to host events and trainings with the goal of reaching the increasingly growing number of motorists on the roadways. In particular, this study seeks to provide a comprehensive compilation of Buckle Up program efforts, and describe how these educational efforts have potentially impacted Oklahoma child motor vehicle injuries and fatalities from 2007-2011, the most recent years in which data is available.

Statement of the Problem

The National Highway Traffic Safety Administration published a report covering misuse of child restraints in 2004. Data were collected in six states during the Fall of 2002. Participating states included Arizona, Florida, Mississippi, Missouri, Pennsylvania, and Washington. Certified AAA Child Passenger Safety Technicians and Instructors obtained consent from caregivers transporting children in child restraints, to enter the vehicle and observe seat use and misuse. Precisely 4,126 vehicles, containing 5,527 child occupants weighing less than 80 pounds, were inspected. Out of the seats inspected, a misuse rate of 72.6 percent was reported by Technicians and Instructors. The most common errors on the seats were loose internal harness straps, which keep the child occupant in the seat, and loose installation with the use of the vehicle seat belt (National Highway Traffic Safety Administration, 2004).

Additional examples of unassuming risks in no particular order are: the caregiver utilizing two systems to lock the seat in when only one system is required, a child placed in a child safety seat and not harnessed, or a seat adorned with aftermarket products, such as, toys, mirrors, belt-locking devices, or seat protectors. All of these examples influence the functionality and safety of a seat, and the protection and well-being of the child. Safe Kids Worldwide (2013) encourages families to do the inch and pinch tests. The inch test is done after installation; the seat should not move more than 1 inch at the belt path. The pinch test checks for correct placement and fit of the internal harness once the child occupant has been installed into the child restraint.

Other aspects of seat safety that can be overlooked are seats that may be expired and can no longer withstand the forces of a crash. This can happen when the seat is purchased from a garage sale or thrift shop, therefore, the seat history is not known. Safe Kids Worldwide (2013) reported that 73 percent of car seats, nationwide, were not used or used incorrectly.

Background of the Problem

In Oklahoma, the law states that a proper child safety seat must be utilized to the child's sixth birthday (State of Oklahoma Legislative Law, 2013). But what does this phrase mean to caregivers? Without knowing the standards, safety cannot be achieved. Fatalities in Oklahoma have fluctuated in the last five years. Fatality data is not yet available for 2012 as it takes epidemiologists a year to gather data for public access (Oklahoma Highway Safety Office, 2012). While motor vehicle fatalities have differed throughout the years, so have injuries. As reported by the Oklahoma Highway Safety Office, Oklahoma has suffered tremendously in the number of child occupants injured in motor vehicle crashes; the ages ranging from birth to 8-years. Child restraint usage reports have been conducted in Oklahoma, and show much room for improvement in terms of the results and the methodology. However, information on the number of community child safety education events, certifications of child passenger safety technicians given, and child injury and fatality reports have previously not been compiled in Oklahoma to gain a more robust picture on areas to improve policies and practices. This study seeks to fill that gap.

Section 11-1112 and 11-1113

With the severity of the issue established for child safety in Oklahoma, this review examined the current Oklahoma law for the safe travel of young children. Section 11-1112 states that every driver, when transporting a child under six (6) years of age in a motor vehicle operated on the roadways, streets, or highways of this state, shall provide for the protection of said child by properly using a child passenger restraint system. For purposes of this section and Section 11-1113 of this title, “child passenger restraint system” means an infant or child passenger

restraint system which meets the federal standards as set by 49 C.F.R. (State of Oklahoma Legislative Law, 2013).

However, numerous motor vehicle fatalities certainly occur beyond the age of six, which adds further concern to the shortcomings of the current law. Between 2007 and 2011, 66 children between the ages of 8 and 14 sustained fatal injuries due to motor vehicle crashes. In 2007, 12 child occupants were fatally injured. In 2008, 18 child occupants were lost. In 2009, 17 child occupants were fatally injured. In 2010, 7 child occupants were lost. In 2011, 12 child occupants were lost (National Highway Traffic Safety Administration, 2012). With the lack of a booster seat law, Oklahoma continues to put children at risk for injuries during motor vehicle transportation. Booster seats are designed for children who weigh more than 40 pounds. A booster seat lifts a child occupant up so that the vehicle lap and shoulder belt properly fit their body. The vehicle seat belt must rest on the shoulder and the hips; the two strongest points of the body. The proper fit and use of a seat belt can save lives.

Purpose of the Study

Descriptive studies seek to summarize data and address the various characteristics which influence the data surrounding a particular issue (Pyrczak, 2004). The purpose of this descriptive study was to first provide a compilation of child safety educational efforts in Oklahoma, and second, to investigate how these efforts have potentially affected the safe transport of Oklahoma children. The study also investigated the number of injuries and fatalities sustained to children birth to age 8 in Oklahoma from 2007 to 2011. The study sought to describe a potential connection between the child injuries and fatalities numbers, the number of persons certified, the

number of Buckle Up events hosted throughout Oklahoma, child restraint usage rate, and the number of motor vehicle injuries and fatalities to child occupants.

Definition of Terms

- *Child Safety Seat*: Referred to as child restraint or car seat. Systems created to protect child occupants from serious injury or death during motor vehicle crashes.

- *Rear-facing Infant-Only Seats*: Child restraints that are specifically designed to be utilized in a rear-facing position only. These seats often come with a base and can be removed from the vehicle to carry the child occupant. This restraint has an internal harness system.

- *Convertible Seats*: Child restraints that can be utilized in a rear-facing position or a forward facing position. These restraints have a foot attached to the base that allows for the seat to be in either rear or forward-facing position. This restraint has an internal harness system.

- *Combination Seats*: Child restraints that can be utilized to a specific harness weight and then convert into a booster seat by removing the internal harness system.

- *Booster Seat*: Child restraints that are designed to boost the child up so that the vehicle lap and shoulder belt correctly fit on the strongest points of their body (the shoulder and both hips). Two types of booster seats exist: high-back and no-back. High-back booster seats are utilized when the vehicle seat has no head rest. A no-back booster seat is used when the vehicle seat has a head rest.

- *Motor Vehicle*: An automobile used for road transportation.

- LATCH: Lower Anchors and Tethers for Children. A method used to install a child restraint with an internal harness.

- *Car Seat Check*: An event through the Buckle Up Program that utilizes Certified Child Passenger Safety Technicians to inspect and correctly install child restraints for each child occupant in the designated vehicle.

- *Child Passenger Safety Technician:* An individual who has successfully completed the Buckle Up trainings and is certified to properly install child restraints upon request. These individuals also serve as advocates for keeping all occupants safely buckled during transportation.

- *National Highway Traffic Safety Administration*: A branch of the United States Government (the Department of Transportation) with the mission of saving lives, preventing injuries, and reducing motor vehicle-related crashes.

- *Oklahoma Highway Safety Office*: Located in Oklahoma City, this department focuses on road safety. The activities hosted by OHSO align with the categories of traffic safety through NHTSA. OHSO works closely with local government enforcement agencies to develop and implement programs that address highway safety issues.

- *Safe Kids Worldwide*: A global organization that is dedicated to preventing unintentional injuries to children birth to age 19. Unintentional injuries are the leading killer of children in the United States.

- *Frontovers*: Motor vehicles which come into contact with an unseen pedestrian while the vehicle is moving forward.

- *Backovers*: Motor vehicles which come into contact with an unseen pedestrian while the vehicle is reversing.

- *Heat Stroke Awareness and Prevention*: A program, known as Never Leave Your Child Alone In a Car, developed by Safe Kids Worldwide and the General Motors foundation. The mission is to decrease the number of heat stroke deaths to child occupants 0 to 14 years of age.

Significance of the Study

The need for continued child passenger safety education has been identified in Oklahoma within this section. Data collected by technicians at Buckle Up events has indicated seat misuse. However, previous investigation has not linked the Oklahoma educational efforts described in this study together to identify connections for Buckle Up impact. In order to prevent injuries, education and awareness must take place first. Being armed with current data, trends, and recommendations allows advocates to better serve families, and present accurate and current information to policy makers in their state.

CHAPTER TWO: REVIEW OF THE LITERATURE

Theoretical Framework: Human Ecological Theory

Urie Bronfenbrenner (1917-2005) is remembered for his extraordinary contributions to the ecological theory of human development. A professor at Cornell University, Bronfenbrenner drew attention to contextual variations in human development and the need for ecological validity in human development research (Hamon & Smith, 2012). He focused much on how the child's development is impacted by interchanges with different contexts (e.g., home, school, and community). He was less concerned with previous studies on a child's genetic and biological makeup. Primarily, his focus was on how various influences of the environment impact the development of the child. Bronfenbrenner (1979) advocated that the environment is a setting which could answer questions and add insight to ongoing trends in developmental research.

Bronfenbrenner argued that who we are, past and present, is influenced by the interaction between nature and the characteristics in which we carry with us into various contexts. In this view, development is influenced by the constant interchange between the individual and a multifaceted environment. Individual behaviors are formed by numerous factors, including religious beliefs, socio-economic status, and public policy. Therefore, social contexts are always casually involved in the shaping of human development (Cox, Burr, Blow, & Parra-Cardona, 2011). Bronfenbrenner (1979) stood behind the idea that if we are to change behavior, we must change our environment because the two are inextricably connected with one another.

Throughout chapter one, research findings and reports were utilized to define a significant stimulator for this study as motor vehicle crashes represent the leading killer of children in the United States (Safe Kids Worldwide, 2013). Research evidence has identified that the misuse of child safety restraints can lead to the unintentional fatal injury of a child (National

Highway Traffic Safety Administration, 2004). Thus, there are, currently, environmental issues at play which influence child development and child well-being.

Bronfenbrenner (1977) believed that development takes place, and is shaped by ongoing interactions between the individual and the environment. The environment, as noted by Bronfenbrenner, is broken into several components, or nested systems: the microsystem, mesosytem, exosystem, macrosystem, and the chronosystem. Each system is influenced by environmental roles, norms, and relationships. Bronfenbrenner compared these nested systems to that of a Russian doll. Inside the intricate layers lies the developing person. The immediate setting in which we find the child is often the home and the family environment.

Bronfenbrenner (1977) urged researchers to look past these immediate settings and focus on the interactions that occur between the individual and various contexts. These interactions influence the development of the child and shape the way he or she responds to their environment. While the developing person is directly influenced by the interconnections between his or her immediate settings, Bronfenbrenner notes that there are events occurring in settings, where the child is not yet present that directly and indirectly affect development.

Direct Effects, or proximal processes, are effects of the immediate social and physical environment (Tudge, Gray, & Hogan, 1997). Bronfenbrenner believed that these immediate stimuli were important, but could not be fully understood without considering more distal processes that affect the developing person (Tudge et al.).

Indirect Effect, or distal processes, are historical, cultural, social, and environmental conditions. Bronfenbrenner believed that these indirectly affect the developing person (Tudge et al., 1997).

Lastly, Bronfenbrenner noted that the structure of a culture or subculture is adjustable. An example of this concept would be ongoing public policies and procedures. State laws are often adjusted when a need for change is presented. Change is constant and gradual; an essential component for succession. To meet needs and address current issues, such as Child Passenger Safety, adjustments must be made so that standards of safety are met. These adjustments can influence behavior and development at the individual level.

Bronfenbrenner's Ecological Theory
Source: Bronfenbrenner, 1977

This study used the Human Ecological Theory as a lens to acknowledge the connections between various factors which have affected the way educators, policy makers, and caregivers have been influenced by the environment. The attitudes and policies which represent the current child safety legislative climate in the state of Oklahoma influences motorist behavior. In using Human Ecological Theory as a lens to connect the various environments associated with this topic, ideas and research are broken down by each nested system within the theory to more fully identify relationships across contexts.

The Microsystem

As mentioned, Bronfenbrenner's Human Ecological Model is composed of layers or systems. The microsystem is defined as the layer closest to the child and contains structures with which the child has direct contact. The microsystem, according to Bronfenbrenner, is the most immediate layer. The microsystem invites the developing person to experience relations in person through activities and interpersonal associations. These experiences occur within the family, school, and peer group. It is within the microsystem that the developing person learns to produce and sustain development (Bronfenbrenner, 1994). Behavior is established based on the environment in which the child grows and develops. Within this context, social and communication skills are acquired, and gender roles and norms are observed and embraced. Through experiences in the microsystem, the developing person gains a sense of identity.

Bronfenbrenner (1979) noted that relationships pertaining to the developing child occur in two ways; from the child and towards the child. For example, a caregiver is a model for behavior for children. When getting into the vehicle, the caregiver must always remember the importance of modeling proper safety behavior to a child. A child who is expected to buckle up for safety and then watches as their caregiver neglects to place them self in a seatbelt may question the importance of buckling up.

Also, a caregiver may either stress the importance of safety devices during transportation or they may neglect the use of a safety device entirely. It is not uncommon to see children riding in a vehicle unrestrained. Children can often be seen standing up in a vehicle or simply sitting without the use of a child restraint or seatbelt. If a caregiver does not understand and value the importance of these safety devices, the child may adopt the same view. Caregivers must make it a priority to buckle up for safety every single time a child is placed in the vehicle.

However, a child can also influence his or her caregiver's beliefs. This is known as bi-directional influencing, and is believed to exist on all levels of the environment (Paquette & Ryan, 2001). Children may adopt practices, such as wearing a seat belt, in which they find of value. Because a child may value these safety mechanisms, the caregiver may soon adopt the same beliefs.

Many researchers believe that positive identity can be multifaceted, allowing the developing person to utilize different strengths in different circumstances. These strengths are shaped by the environment and values, which are made up of individual developmental niches that the developing person inhabits, and through encounters with a succession of microsystems during the course of each day, including home, peer groups, and school (Brooker & Woodhead, 2008). Hence, research has indicated that a child's behavior will align with his or her environment. Within the microsystem, learned responses are gained, and bidirectional influences and processes with caregivers and others close to the child also shape development. The most immediate environment is often the home environment and includes interactions with caregivers. These interactions affect the tone of the environment which influences the developing child.

Summary of the Microsystem and Child Passenger Safety

The most immediate layer of the ecological model, influenced by caregivers, peer groups, and school relations, is the microsystem. Research suggests that a child's behavior will align with his or her environment. In regards to child passenger safety, a child will either learn to value safe transportation or not develop a respect for road safety based upon the behaviors and models presented to the child by those in the immediate setting.

The Mesosytem

The mesosytem is the next layer in Bronfenbrenner's Human Ecological model. This layer provides the connection between the structures of the child's microsystem. These links take place in two or more settings in the developing person's environment (e.g. home and school) thus, the mesosytem is a system of microsystems (Bronfenbrenner, 1994). As an example, Epstein (1983) found that two-way communication between caregivers and the school resulted in positive outcomes. Epstein reports that the effects of this relationship provided greater student initiative (e.g., higher test scores) during the elementary school years and higher grades once the child reached high school.

Multisetting participation occurs when one person engages in an activity in more than one setting. Bronfenbrenner (1979) notes that these experiences occur sequentially across settings in which the developing person becomes an active participant.

Indirect linkages occur when the same person is not directly involved in both of these settings. To complete the link, a third party may step in and fill the role of an intermediate link between persons in the mesosytem. Here the participants no longer meet face-to-face and may not be thought of as members of a second order network between two settings (Bronfenbrenner, 1979). This linkage is described as taking place in two or more environments of the developing person's microsystem (e.g. home and school). Parental expectations for exceptional grades may influence the behavior of the student. School personnel may express concern for the student to the caregivers, completing the indirect linkage relationship

Intersetting communications are the sharing of information in one setting with the intent of reaching another person in the other setting. Information can be given face-to-face, through written or verbal correspondence via phone calls or e-mails. Communication in this setting is

either one-sided or two-sided (Bronfenbrenner, 1979). Two settings are described in this form of communication (e.g., home and school). As an example, school personnel may provide phone calls to the members of the developing person's microsystem to share success or concern.

Intersetting Communication and Buckle Up

Many community agencies recruit Child Passenger Safety Technicians to speak with their groups about the importance of child restraints. These speaking engagements impact the views and beliefs of caregivers and, thus, impact the way the child will be taken care of during transportation. The reader is directed to Figure 1 in the appendix to view data collected for Community Education from 2007-2011. Communication is done face-to-face and the information received will most likely be passed along to other caregivers.

Buckle Up events are hosted throughout Oklahoma. These events seek to educate and empower caregivers. Here communication is two-sided; the technician is not only there to give instructions, but also to answer questions the caregiver may have. Buckle Up events and speaker bureaus link public policy to caregivers. The educational efforts share current safety standards and state laws with caregivers.

Intersetting knowledge is the gathering of information through one setting and to be shared in another setting. This information can be obtained through the experiences of intersetting communication or from external sources such as books.

Intersetting knowledge and Buckle Up

Buckle Up trainings are open to any individual who seeks to become an advocate. The National Child Passenger Safety training is conducted over a span of four days. The training offers extensive lectures over motor vehicle crashes, child restraint options, LATCH, and safety standards. Multiple written tests, hands-on tests, and a completion of a Buckle Up event are

required before technician status is earned. Buckle Up trainings are an example of intersetting knowledge. The information obtained during trainings is transmitted through lectures and readings. Once certified, the individual has the appropriate knowledge to share with others who transport children.

Bronfenbrenner (1979) noted that the most critical direct link between two settings is the one that establishes the existence of a mesosytem through the connection of experiences. In regards to child passenger safety and the mesosytem, the microsystem (e.g. home) is linked to environmental expectations and policies for a state. Indirect and direct communication between technicians and caregivers are implemented in various ways. With public policy and standards continuously changing, the technician serves as a third party, linking communication efforts between community child safety educational efforts and the home environment.

Summary of the Mesosytem and Child Passenger Safety:

The mesosytem represents the layer in which connections of the developing person's experience work together to both communicate and make decisions. In regards to child passenger safety, different forms of educational efforts exist; trainings, car seat check up events, speaker bureaus, consultation, and literature. The technician serves as a link from the microsystem to the external environment.

Exosystem

The exosystem represents the links and processes that occur in the developing person's experience across more distal settings. While the developing person is not directly affected by exosystem events, the immediate setting is influenced. An example of this relationship would be

how a child may be influenced indirectly by a parent's work environment (Bronfenbrenner, 1994).

The exosystem is a two stage sequence. Each sequence influences the ongoing development of the individual. The first connection occurs in the external setting to processes occurring in the developing person's microsystem, and the second linking microsystem processes to the developmental changes in a person within that setting. Thus, the developing person is affected by the indirect influence of the external environment on the immediate setting. Beyond the microsystem, are factors which indirectly affect the child. An example of this pertaining to the topic of this study would be state, or local level public policy.

The family unit, within the developing person's microsystem, often must make decisions on a proper restraint that will accommodate the developmental needs of the child and to satisfy current public policy. Lobbying often takes place with the intent of adjusting current policies for the greater good of the environment. As policies adjust, families must abide by changes or certain consequences are applied. In terms of child passenger safety, a stronger public policy may require the family unit to seek out additional restraints to accommodate the developing person as they grow.

Lobbying practices and legislation in Oklahoma are factors that indirectly affect child well-being, as they influence practices and behaviors in the child's most immediate environment. In January of 2014, Safe Kids Oklahoma, AAA, and the Injury Prevention Council worked towards rallying support with the Republican party to create a new booster seat law for Oklahoma. The law would require children to ride in a booster seat until they were 8-years-old or 80 pounds. With much disappoint, the proposal did not make it out of committee. These efforts do not affect caregivers in Oklahoma currently. However, if legislation would have voted for and

approved the law, it would have dramatically affected how caregivers transported their children in the state. Thus, through the lens of the exosystem, state and local policies indirectly influence children by shaping practices and behaviors in the home (microsystem) environment.

Summary of the Exosystem and Child Passenger Safety:

The exosystem influences the links and processes that occur in the developing person's experience across more distal settings. In regards to child passenger safety, local and state public policy influences behaviors in the more immediate setting, and the way a child is required to be transported.

Macrosystem

The fourth layer of the Ecological model is the macrosystem. This system encompasses the micro-, meso-, and exosystem characteristics of the environment through beliefs systems, knowledge, customs, and life-styles. These characteristics are important aspects of the systems discussed. By encompassing these systems, the macrosystem ultimately seeks to look beyond the labels discussed, and identify social and psychological aspects which affect the environment, and in turn, development (Bronfenbrenner, 1994).

The macrosystem is the product of the developing person's life; impressionable moments, relationships, activities, etc. These all encompass who the developing person has become (Hamon & Smith, 2012). Examples of characteristics which affect the development of a person include socio-economic status, religious upbringing, or public policies at the larger, societal level (Bronfenbrenner, 1979). These experiences shape the development of the child in various ways. In regards to child passenger safety, the beliefs and policies have not remained static. The

standards never remain constant, just as the developing person does not remain constant. Each is an ongoing work in progress which continues to evolve.

The macrosystem is heavily composed of the values of a subculture. In this layer, organizational and behavioral patterns find support. The macrosystem influences the identification of class, ethnicity, and cultural differences in society. An individual does not remain static cognitively throughout their life. As knowledge is obtained and personal growth and identity development occurs, the individual has a shift in his or her perception, imagination, and reasoning. Through these experiences a person's cognitive activity shifts.

An overview of current policies and practices are outlined below. These adjustments show, that, over time, society has evolved in terms of beliefs for safety standards and recommendations. Experiences have shaped the way society views what is important and why. Gradually, over time, laws begin to shift and recommendations are made as to what is needed to safely transport a child.

The National Highway Traffic Safety Administration (2001) illustrates four steps to proper child passenger safety: rear-facing, forward-facing, booster seats, and seatbelts. The American Academy of Pediatrics (2011) recommends that all children ride rear-facing until they are at least two years of age. Certified Child Passenger Safety Technicians and Instructors coach caregivers to utilize their child restraint in the permitted rear-facing mode to the upper height and weight limits of the seat. While Oklahoma law does stipulate a child restraint be used until a specific age, it does lack recommended positions of the child restraint that may further reduce injuries and fatalities.

In regards to influences from the macrosystem, agencies such as the National Highway Traffic Administration and the American Academy of Pediatrics have adjusted their stance on

what is the standard of excellence for safety. These adjustments exist due to experiences which have adjusted the way child passenger safety is viewed in the environment. Fatalities and injuries to child occupants force professionals to reevaluate the safest means of transport in a child restraint.

Here, the link between the macrosystem and child passenger safety encompasses policy developments pertaining to child occupant safety. In the case of this study, information and policy at the national level influences policy at the state or local level, which, in turn, affects development at the more immediate level. These associations also highlight potential areas for improvement between the different contexts. The current law for Oklahoma requires children be transported in a child safety seat until their sixth birthday. However, lobbying efforts seek to raise standards to require a child to ride in a booster seat until they are 8-years-old or 80 pounds. The evolution of the public policy indirectly affects the child in regard to how the child is transported by caregivers on a daily basis.

Summary of the Macrosystem and Child Passenger Safety:

The macrosystem ultimately seeks to look beyond the labels discussed, and identify social and psychological aspects which affect the environment. In regards to child passenger safety, standards continually evolve as attitudes and beliefs change. Never static, beliefs are shaped and molded through time. Federal policy often shapes state and local policy, and these policies can shape behaviors and practices in the more immediate contexts such as within the family.

Chronosystem

The last system added to Bronfenbrenner's human ecological theory was the chronosystem. This layer focuses on events throughout the life course which not only affect the person, but also the environment. This system was added by Bronfenbrenner so that the research model was available to examine the influence of the person's developmental changes (continuities) and historical changes over time, which influence the context in which the individual is living and developing (Bronfenbrenner, 1986). Throughout history, there have been numerous events which have altered the way society views different tasks. In this view, because of these changes in experiences, our environment is adjusted.

Child Passenger Safety has advanced dramatically in the past fifty years. Dating back to 1965, Safe Ride News (2004) reports that the Physicians for Automotive Safety formed and began a series of protests regarding the lack of child occupant protection in motor vehicles. In 1968, Ford designed the Tot-Guard child restraint and General Motors produced the Love Seat for Toddlers. The Love Seat for Toddlers is followed up with the Infant Love Seat, which is noted as the first rear-facing only seat, and the Bobby Mac convertible seat. In 1971, the National Highway Traffic Safety Administration adopted the Federal Motor Vehicle Safety Standard 213 which requires manufactures to crash test child restraints with a vehicle seat belt (Safe Ride News, 2004).

In 1979, Mohan and Schneider published *An Evaluation of Adult Clasping Strength for Restraining Lap Held Infants*. Mohan and Schneider conducted pull tests to measure forces an adult can voluntarily exert while holding an infant dummy of 7.9 kilograms. Crashes were simulated at 50 kilometers an hour during a front collision. The study showed the need for child

restraints as caregivers at the time were not able to safely restrain their children against crash forces (Mohan & Schneider, 1979).

In 2011, the American Academy of Pediatrics began a parent education program known as "First Ride, A Safe Ride". As laws begin to strengthen throughout the United States in the early 80's, the Oklahoma Highway Safety Office began to develop a Child Passenger Safety Restraint System education program. In 1984, Ronald Regan proclaimed "National Child Passenger Safety Awareness Day" by Joint Resolution #2890. This proclamation continues to be celebrated. In 1990, the Federal Aviation Administration required the use of approved child restraints for children under the age of 2 due to the 1989 deaths of two infants fatally injured during a crash (Safe Ride News, 2004).

In 1992, Chrysler introduced integrated toddler seats into their mini vans. These toddler seats are child restraints that are built into the vehicle. Other manufacturers soon followed in Chrysler's footsteps. In 1996, the National Highway Traffic Safety Administration implemented an amendment to air bag requirements, which include warning labels and air bag off features for times when a child restraint is placed in front of an active airbag. This amendment came after the November 1994 death of the first known infant fatally injured by an airbag while rear-facing in the front of a vehicle seat. By 1996, the death count had risen to 21. In 1997, Safe Kids Worldwide created the Buckle Up program which sought to train, educate, and certify individuals to become Child Passenger Safety Technicians and Instructors (Safe Ride News, 2004).

Currently, Oklahoma's child restraint law is a work in progress. *A National Rating of Child Occupant Protection Laws,* conducted in 2001 by Safe Kids Worldwide, reviewed child restraint laws in all 50 states and the District of Columbia. The state child restraint laws were

measured against a model which requires for all children to utilize correct restraint systems in a motor vehicle. On this scale, Oklahoma's child restraint law received an F. This rating served as a reminder that there is much to be done throughout the state to raise the standards of safety when transporting a child.

Advocates are working toward raising the child restraint law to require children to ride in a booster seat until they are 8-years-old or 80 pounds versus the current law requiring children to ride in an approved child restraint until their sixth birthday. Prior to 2005, persons transporting a child occupant under 6 without a child safety restraint or persons transporting a child between the ages of 6 and 13 without the use of a safety belt were fined $10.00, and expected to pay court fees of $15.00. On November 1, 2005, violators of the Oklahoma child restraint law were required to pay $50.00 and all court fees due to a violation. Later, in 2007, the first session of the 51st legislature modified these fines. Violators are now expected to pay $75.00 and all court fees for these violations (State of Oklahoma Legislative Law, 2013).

Summary of the Chronosystem and Child Passenger Safety:

This layer focuses on how the transpiring of events over time not only affect the person, but also the environment. In regards to child passenger safety, policy makers and advocates have been affected by events occurring in the environment, in the various socio-historical changes. Due to these events, the environment has shifted in its beliefs, attitudes, and policies. Fatalities and injuries sustained by child occupants require alterations to be made so that the environment is safer for those who occupy it.

Summary

In summary, motor vehicle crashes are the leading killer of children in the United States (Safe Kids Worldwide, 2013). Child restraints and education are crucial components for keeping our children safe during motor vehicle transportation. The Buckle Up Program has focused efforts through community education, events, trainings, and legislative efforts to improving awareness throughout the United States on the importance of Child Passenger Safety.

Reports show that Oklahoma child fatality rates from motor vehicle crashes have dipped and risen in the last five years (Oklahoma Highway Safety Office, 2012). The concern for child occupant protection remains high and consistent. Bronfenbrenner's ecological theory provides a lens for the field of child passenger safety in that it links both the developing person and various contexts within the environment. The goal of the descriptive study was to provide a compilation of child passenger safety educational efforts to gain insight on the efforts that have taken place in Oklahoma between 2007 and 2011. This study also sought to investigate and describe how child passenger safety educational efforts may be associated with child occupant injuries and fatalities over the past five years.

The two primary aims of this study were as follows:

1) To provide a compilation of the educational efforts that have taken place throughout Oklahoma by means of trainings, speaking engagements, and Buckle Up events between 2007 and 2011.

2) To describe the potential association between trainings, certifications, Buckle Up events, seat usage, and child occupant with child injuries and fatalities in motor vehicle crashes over the past from 2007-2011.

CHAPTER 3: METHODOLOGY

Descriptive Studies

The purpose of this descriptive study will be to, first, provide a compilation of child passenger safety educational efforts to gain insight on the current efforts that have taken place in recent years, and second, describe the potential relationship between child passenger safety educational efforts with child motor vehicle injuries and fatalities over from 2007-2011. Descriptive studies are done to illustrate the associations or relationships between things in the world around us (Office of Research Integrity, 2011). Bronfenbrenner focused on how various influences of the environment impact development. Bronfenbrenner (1979) advocated that the environment is a setting which could answer questions and add insight to ongoing trends in developmental research. Therefore, the descriptive study will examine data sources from various environmental contexts which potentially influence child occupant well-being.

Collis and Hussey (2009) described analytical research as a continuation of descriptive studies. This form of research goes beyond merely describing the characteristics, to analyzing and explaining why or how the phenomenon being studied is happening. The study sought to go beyond describing the basic characteristics of child passenger safety efforts and rather analyze available data to identify associations. The study sought to address the effectiviness of the program over a longer period of time (longitudinal) so that educators could further understand some potential items to keep in mind when addressing the topic of child passenger safety.

In the case of this study, education is deemed an invaluable tool in order to prevent injuries. To continue to grow and make strides in safety standards, opportunities must exist for individuals to receive answers and assistance. Research must continually evaluate scenarios and cases that produce increased understanding in order to continue to promote and protect child

well-being. Along with this, opportunities for individuals to seek out education are crucial. With misuse of child restraints being high, caregivers must have an avenue to seek out assistance when the need presents itself. The study will seek to provide information about the Buckle Up program and the child occupant injuries and fatalities Oklahoma has seen from 2007-2011. Data are intended to generate both interest and concern in the community so that Oklahoma can continue to evolve and improve how child occupants are transported on a daily basis.

Procedure

Disclosure of personal or sensitive information was not required in order to complete this research. Data were extracted from Safe Kids Worldwide and the Oklahoma Highway Safety Office. Safe Kids Worldwide produces annual reports, available to the public, which share program accomplishments. The names of the persons trained are not disclosed. The Oklahoma Highway Safety Office previously conducted a Child Restraint Usage Survey, for Oklahoma, beginning in 2006. The names of the persons surveyed are not disclosed. Only locations of observations throughout Oklahoma are made public.

Data Analysis Plan

Quantitative reports will be generated for the following areas:

- The number of Buckle Up trainings, events, and community education events across Oklahoma between 2007 and 2011 (extracted from Safe Kids Worldwide database).
- Child safety usage rate in Oklahoma as reviewed by the Oklahoma Highway Safety Office between 2007 and 2011 (extracted from Oklahoma Highway Safety Office database).

Finally, descriptive comparisons between the areas of inquiry above and child motor vehicle injury and fatality rates will be examined through the utilization of graphs and tables. These descriptions are outlined below:

- Describe the potential association between Buckle Up events and child safety usage rate between 2007-2011.
- Describe the potential association between the child usage rate and child occupant injuries and fatalities between 2007 and 2011.
- Describe the potential association between Buckle Up events and child occupant injuries and fatalities between 2007 and 2011.
- Describe the potential association between Buckle Up trainings, technician certification and recertification and community education between 2007 and 2011.

CHAPTER FOUR: FINDINGS

Buckle Up Events and Child Safety Usage

Data were collected from Safe Kids Worldwide and the Oklahoma Highway Safety Office. Data were reviewed to look for associations between the number of Buckle Up events hosted and the usage rate of child restraints between 2007 and 2011. The number of Buckle Up events hosted during this time frame were: 2007: 21; 2008: 19; 2009: 31; 2010: 67; 2011: 77. Child restraint usage rates between 2007 and 2011 were identified as: 2007: 85.4 percent; 2008: 85.0 percent; 2009: 86.3 percent; 2010: 85.5 percent; 2011: 82.6 percent. Refer to the appendix, Table A, for a graphical depiction of these results.

Typically, when a new educational service becomes available and is being introduced to the public, the first few years tend to fluctuate with the number of events that occur as operational procedures are refined. As the public begins to realize the services provided by Buckle Up are in fact useful and add value to the community, the number of events continue to rise. Going hand in hand with a slow rise of Buckle Up events educating the general public on the importance of proper child safety, the percentage of child restraint usage also slowly rose.

Child Restraint Usage versus Fatalities and Injuries

Data were collected from the Oklahoma Highway Safety Office. Data were reviewed to look for associations between the child restraint usage rate in Oklahoma and the number of motor vehicle fatalities and injuries to children birth to 8-years-old in Oklahoma. Usage rates sat in the 80 percentile range during this time frame; however, data are showing the number of fatalities at: 2007: 22; 2008: 6; 2009: 16; 2010: 11; 2011: 11. Injuries were reported as: 2007:

1,553; 2008: 1,301; 2009: 1,401; 2010: 1,381; 2011, 1,178. Refer to the appendix, Table B, for a graphical depiction of these results.

Though the amount of data available is slightly limited since the need to keep such data is new, it shows after Safe Kids Worldwide and the Oklahoma Highway Safety Office began the Buckle Up program and the education classes began the number of injuries and fatalities to children birth to 8-years-old began to decrease. When the first sets of data were collected in 2007 the fatalities were at a high; however, the last year of data (2011), shows the fatality rate at half. Injuries during 2007 were at the highest point over the period reviewed, however, in 2011 were at their lowest point.

Buckle Up Events versus Fatalities and Injuries

Data were collected from Safe Kids Worldwide and the Oklahoma Highway Safety Office. Data indicated a steady increase in the number of Buckle Up Events hosted in Oklahoma between 2007 and 2011. The number of Buckle Up events hosted during this time frame were: 2007: 21; 2008: 19; 2009: 31; 2010: 67; 2011: 77. Data indicated a fluctuation in the number of fatalities reported throughout this time frame. Data for 2007 to 2011 reports the number of fatalities at: 2007: 22; 2008: 6; 2009: 16; 2010: 11; 2011: 11. Lastly, data indicated a slow, but steady, decrease in the number of reported injuries due to motor vehicle crashes in Oklahoma. Injuries were reported as: 2007: 1,553; 2008: 1,301; 2009: 1,401; 2010: 1,381; 2011, 1,178. Refer to the appendix, Table C, for a graphical depiction of these results.

Reviewing the data from Safe Kids Worldwide and the Oklahoma Highway Safety Office data shows an overall potential negative association between the number of Buckle Up events and the number of reported injuries and fatalities involving motor vehicles.

Buckle Up Trainings, Technician Certification/Recertification, and Community Education

Data were collected from Safe Kids Worldwide to review number of trainings, certification/recertification status, and community education throughout Oklahoma between 2007 and 2011. In 2007, 2 trainings were hosted resulting in 170 new certifications. Precisely 245 technicians renewed their certification in 2007. A Safe Kids representative hosted 4 community education engagements in 2007. In 2008, 6 trainings were hosted resulting in 167 new certifications. In 2008, 87 technicians renewed their certification and 20 community education events were hosted. In 2009, 6 trainings were hosted resulting in 127 new certifications and precisely 101 renewed certifications. Also in 2009, 66 community education events were hosted. In 2010, 20 Buckle Up trainings were hosted, resulting in 207 new certifications and 101 certifications were renewed. In the same year, 76 community education engagements were hosted by Safe Kids representatives. In 2011, 18 Buckle Up trainings were hosted resulting in 223 new certifications and 162 recertifications. Precisely 99 community education events were hosted that same year. Buckle Up events were hosted in various locations throughout Oklahoma. Refer to appendix, Figure D, for a graphical depiction of these results.

Looking at the data provided by the Oklahoma Highway Safety Office and Safe Kids Worldwide there is evidence of a possible association. In 2007, when Safe Kids Worldwide started by hosting only 2 training events, the number of fatalities that year was at its highest of 22 children for the period of time reviewed for this study. Focusing on the most current set of data from 2011, the data show a substantial increase in trainings from Safe Kids Worldwide, and a decrease in fatalities from Oklahoma Highway Safety Office with 18 trainings and 11 child fatalities.

Descriptive Comparisons of Program Activity and Injuries/Fatalities

Lastly, an overall table of all data reviewed for the study (Buckle Up events, child safety seat usage, child occupant injuries and fatalities, and trainings, certifications, and recertifications) was created to give the reader an overview of all potential patterns and associations. Refer to appendix, Table E, to view these results.

CHAPTER FIVE: DISCUSSION

The purpose of this descriptive study was to review and compile available data for events, trainings, injuries, and fatalities for child passenger safety in Oklahoma between 2007 and 2011. The research sought to identify potential connections or associations between educational efforts and child occupant injuries and fatalities during this time frame. Data was utilized from major sources such as the Oklahoma Highway Safety Office and Safe Kids Worldwide. All data is available to the general public and readily available for review; however, a compilation of such data had not previously been constructed and investigated.

A compilation of Buckle Up events and trainings was used to look at program growth throughout Oklahoma. At the same time, the research sought to examine whether these efforts were benefiting Oklahoma's children by reducing unintentional injuries and fatalities by the use of a properly installed child restraint. The Buckle Up program seeks to assist caregivers in both learning and embracing the standards for excellence in safely transporting children so that all children are riding safely when being transported in a motor vehicle.

Discussion of Findings

After compiling data and reviewing the reported activities, injuries, and fatalities, the research indicates a steady trend of incline in activities, a steady and leveled child restraint usage rate for Oklahoma, and a slight decrease in the number of injuries and fatalities to children birth to 8-years of age in Oklahoma.

According to Bronfenbrenner's Human Ecological Theory, the interactions between nature (our biological make-up) and the various contexts/environments encountered influences our behavior and development. Bronfenbrenner believed that development is influenced by the

constant interchange between the individual and the environment. Our behaviors are formed by a variety of factors found within our environment. Therefore, social contexts are always casually involved in the shaping of human development (Cox, et al., 2011). Bronfenbrenner (1979) was a strong believer that if we are to change our behaviors, we must change our environment because the two are connected with one another.

When looking at the Chronosystem aspect of Bronfenbrenner's theory, we can see changes, as early as 1965, in the trajectory of child passenger safety. A closer look shows a continuation of steady growth in the world of child passenger safety with much data to back the need for the Buckle Up program. Improving child restraint use and laws that enforce safe child restraint practices has been a crucial component in our environment; a field that is still in need of much improvement. Human Ecology Theory stresses that change happens through constant interaction with various environmental contexts, thus, if child restraint advocacy efforts are to create change, they must also be looking to create constant change in the environment. The data for child restraint usage, injuries, and fatalities in Oklahoma reported in this study only fuels the need for continued growth and improvements in our laws protecting the safe transportation of our children.

Implications for Policy Makers

The numbers of injuries sustained to child occupants in Oklahoma is startling. The number of fatalities is equally disheartening. Oklahoma has an immense need for improvement in state laws for transporting children on the roadways.

Research has shown that 73 percent of child restraints, nationwide, are used incorrectly and that a properly installed child restraint saves lives (Safe Kids Worldwide, 2013). The current

law only protects children up the age of 5; however, data indicates that injuries and fatalities continue to be seen in children much older than this. Examinations for this study show that between 2007 and 2011, Oklahoma lost 66 children between the ages of 8- and 14-years-old in motor vehicle crashes. These data point toward a deficit in the Oklahoma law. Safety and prevention efforts can make a difference.

Katie Mueller, Executive Director of Safe Kids Oklahoma, states that "in 2012, 24 Oklahoma children between the age of 6- and 10-years-old died in motor vehicle crashes. The best way to make a difference for these families is to increase our child restraint law to address this age group. We could save the lives of young children" (K. Mueller, personal communication, March 3, 2014). Many states, such as Texas, New Mexico, Colorado, Kansas, and Missouri, that border Oklahoma, have mandated booster seat laws protecting children up to the age of seven. Tennessee and Wyoming have adopted policies for booster seat use up to the age of eight (Center for Disease Control, 2014).

Oklahoma would be wise to adopt a booster seat law and mandate older children to be protected by the use of a booster seat. Raising fees associated with violations may also strengthen the importance for properly transporting children. These injuries and fatalities are a tragedy and, most importantly, preventable. By raising the bar of excellence for safe transportation in the environment, lives will be saved.

Implications for Child Passenger Safety Technicians

The Oklahoma Highway Safety Office has regularly conducted observational studies to determine the usage rate of child restraints in the state of Oklahoma. Results from this study highlight the need for child safety technicians to work with the Oklahoma Highway Safety

Office to perform a hands-on car seat check much like the 2004 study conducted by the National Highway Traffic Safety Administration. The NHTSA study of 2004 encouraged hands-on investigation of seat usage versus simply observing child occupants in a child restraint. Visuals give us little knowledge of seat usage and skew the data.

Arizona, Florida, Mississippi, Missouri, Pennsylvania, and Washington were among the states participating in the National Highway Traffic Safety Administrations hands-on car seat check (National Highway Traffic Safety Administration, 2004). This investigation provided technicians with a clear understanding of usage rates and compliance with the child restraint utilized by children weighing less than 80 pounds.

By entering a motor vehicle and inspecting the child restraint, a technician can determine many crucial factors that determine the success rate of the child restraint. A study of this magnitude would provide Oklahoma with a much broader understanding of usage rates and the safety of child occupants throughout Oklahoma.

The Buckle Up program has shown strength in program growth through the continued incline in events, trainings, and the number of new and renewed technician certifications. The investigations of this study show that educational efforts increased over the time period reviewed and a decrease in the number of injuries and fatalities sustained to Oklahoma children birth to age 8-years of age. The data also show a steady and leveled child restraint usage rate for Oklahoma from 2007-2011.

While improvements can be seen through numbers, much work is needed to sustain and continue these positive trends being noted. Policy makers would be wise to adopt a booster seat law for the state, protecting children to the age of 8-years. More rigorous measures of data

collection are needed to provide professionals with a better understanding of child restraint usage rate so that policies in Oklahoma can be supported and reviewed for change.

Based upon Bronfenbrenner's Theory of Human Ecology, there are still many needed areas of change in the environment to lead the way for continued improvement in the safe transportation of children. Bronfenbrenner provides several systems which are used as a lens to examine the environment and factors within the environment which impact the developing person. In chapter two the different systems of Human Ecology Theory were described. One of the main benefits of the Human Ecology framework is the identification of how the different systems (from more distant to immediate influences) interact with one another. For example, influences from the macrosystem, (state agencies, state policies, etc.) have adjusted and improved stances on child passenger safety due to injuries and fatalities of young child occupants. These changes set new standards of excellence which are to be adopted at different levels of the environment. As these changes are across the different system, they indirectly affect the environment closest to the developing person in that behavioral practices in the family are impacted.

Both the macrosystem and exosystem indirectly affect the behaviors and practices in the home of the developing person (the more immediate environment). With the changing of standards, policies, and laws, caregivers can reevaluate their own child passenger safety practices. For example, and noted earlier, should Oklahoma adopt a booster seat law, caregivers will be required to alter the way they transport older children who are currently not protected by Section 11-1112. At the mesosystem level, safety and prevention efforts conducted by child safety and other community educators connect policies at the macro and exosytem levels with families at the microsystem level. Through these efforts training and information is provided to

caregivers about current laws and effective procedures so that better practices can be embraced and carried out in families.

Bronfenbrenner's many layers of the Human Ecology Theory provide a lens through which to examine how different factors in the environment influence child passenger safety practices. According to this lens, if change is to occur the interconnection between different layers of the environment must be taken into account to better understand how to make adjustments which can shape and better our environment.

Limitations

The data reviewed for this study was from a specific time frame during Oklahoma's child passenger safety history, and was gathered second hand. Data is delayed by a year for the purpose of collection and compilation by epidemiologists. Future efforts should investigate longer time periods, as well as include more recent reports.

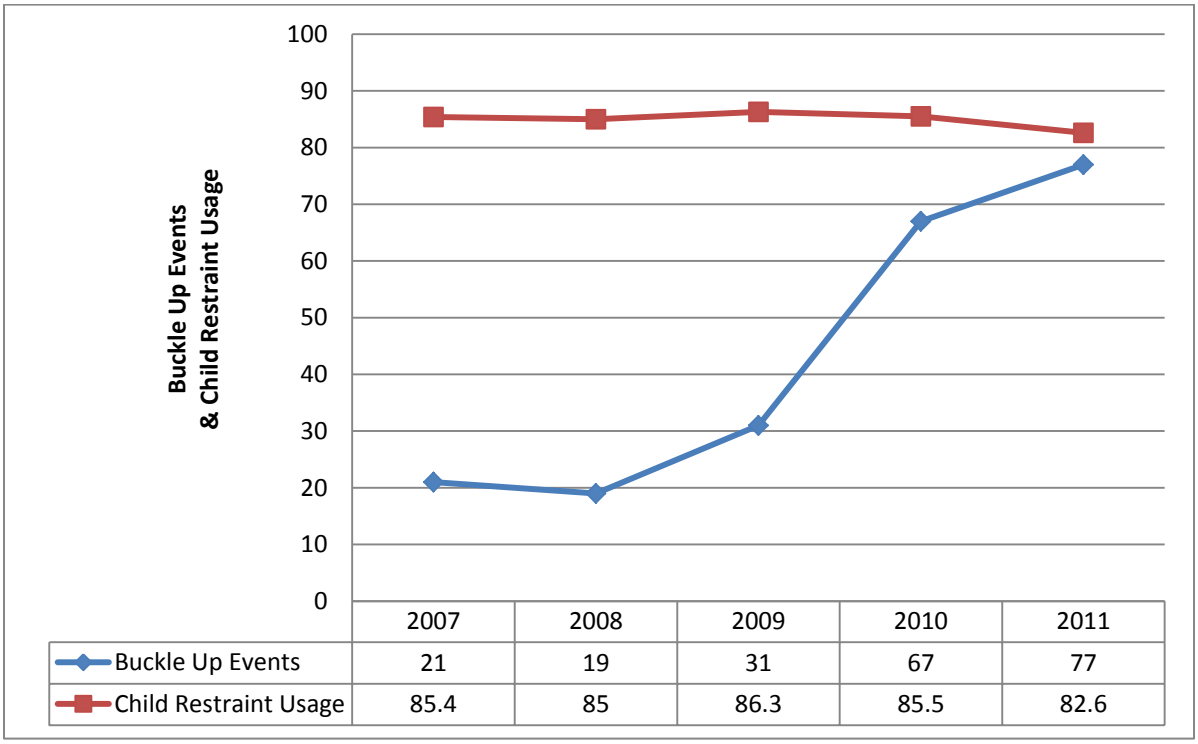
Conclusions

The environment continues to evolve due to new knowledge obtained in the field. Factors that influence a change in perspective can be very heart wrenching, such as, injuries and fatalities. The environment must move away from being reactive and work towards a more proactive solution in keeping Oklahoma child occupants safe during transportations. Aligning policies and laws with current standards and practices, along with continual advocacy for the enrichment of our programs and educational efforts increases the likelihood of protecting the safety and well-being of our child passengers.

Numerous points to consider were identified throughout the study. First, as Buckle Up events were made available to the Oklahoma public, the state usage rate was steady over the time period examined. Secondly, injuries and fatalities decreased as Buckle Up events were made available. Lastly, this study lends support to the notion that interest in the Buckle Up program has continued to grow. A larger quantity of individuals began certifying each year with a stable increase in the number of renewals every year.

While the research cannot identify the Buckle Up program as the sole reason for the increase in usage rates and decrease in injuries and fatalities, it does indicate that the program may have influenced perspectives on child passenger safety, and is therefore, a potentially beneficial program to the community. The Human Ecological framework helps highlight different factors in the environment which play a crucial role in aiding change and shifting perspective. Bronfenbrenner illustrates that there is no single factor that paves the way for change in the environment, but that change occurs through the interaction of various environmental contexts. Along these lines, while some success can be seen when examining the data in this study, the findings highlighted here also suggest that there remains much work to be done across environmental contexts left to be accomplished in protecting the safety of our child passengers.

APPENDIX



	2007	2008	2009	2010	2011
Buckle Up Events	21	19	31	67	77
Child Restraint Usage	85.4	85	86.3	85.5	82.6

Figure A: Buckle Up Events and Child Restraint Usage

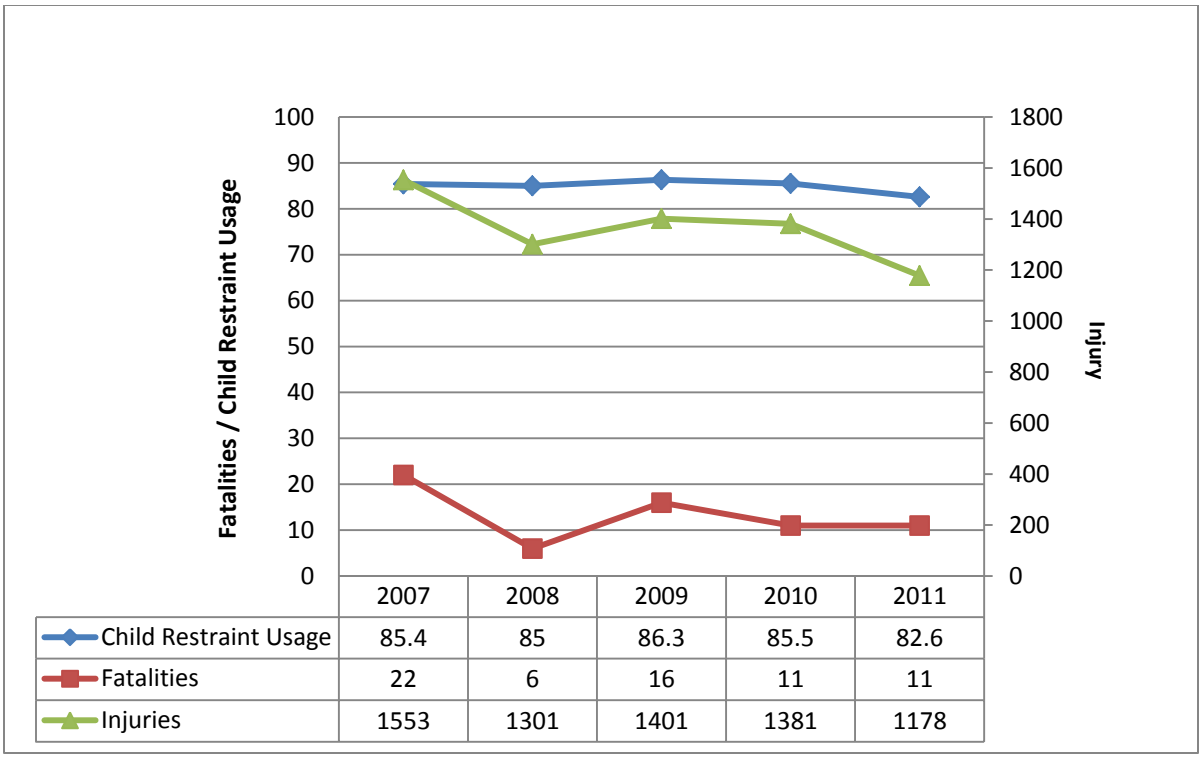
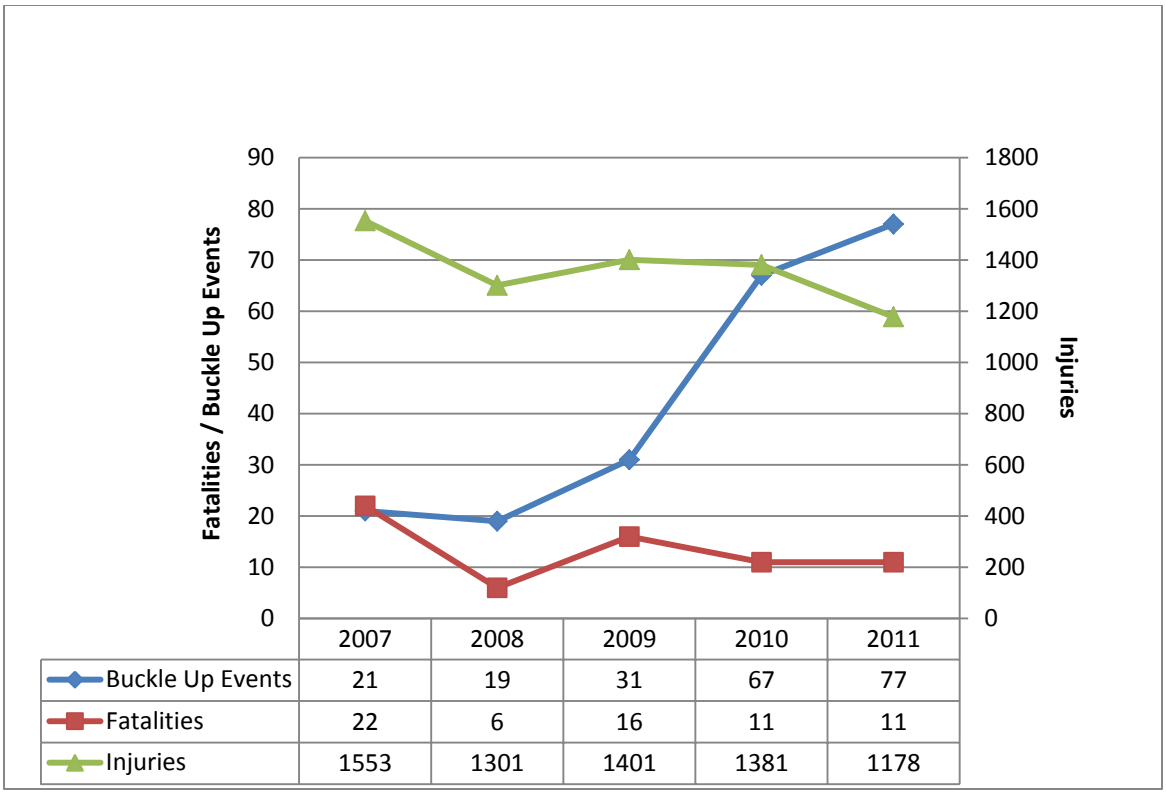
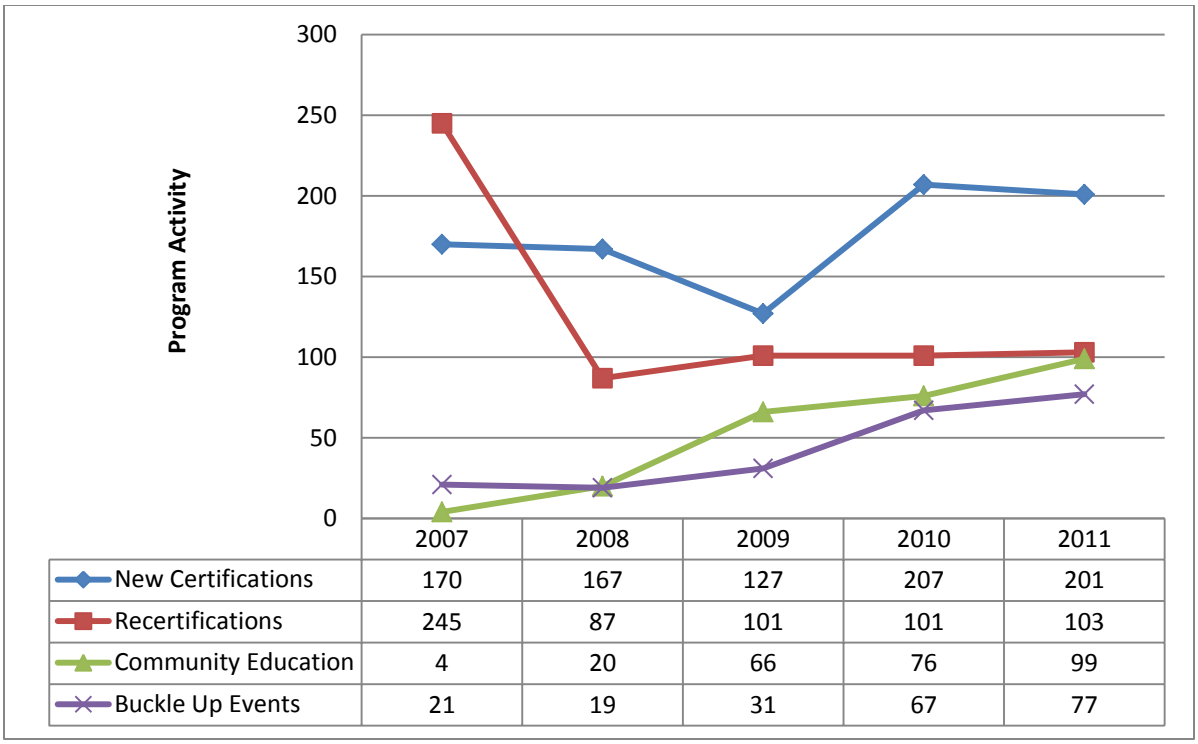


Figure B: Fatalities, Injuries, and Child Restraint Usage



	2007	2008	2009	2010	2011
Buckle Up Events	21	19	31	67	77
Fatalities	22	6	16	11	11
Injuries	1553	1301	1401	1381	1178

Figure C: Fatalities, Injuries, and Buckle Up Events



	2007	2008	2009	2010	2011
New Certifications	170	167	127	207	201
Recertifications	245	87	101	101	103
Community Education	4	20	66	76	99
Buckle Up Events	21	19	31	67	77

Figure D: Technician Certification/Recertification, Community Education, Buckle Up Events

Table E

Descriptive Comparisons of Program Activity and Injuries and Fatalities

Oklahoma Report 2007-2011

Year	BU Events	Rest. Usage	Fatalities	Injuries	New Certs.	Recerts	Community Education
2007	21	85.4	22	1553	245	4	2
2008	19	85	6	1301	87	20	6
2009	31	86.3	16	1401	101	66	6
2010	67	85.5	11	1381	101	76	20
2011	77	82.6	11	1178	103	99	18

Table E

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