

ADVERSE CHILDHOOD EXPERIENCES: THE NEUTRALIZING IMPACT OF
RESILIENCE

A Dissertation

Presented in Partial Fulfillment of the Requirements for the
Degree of Doctor of Education

With a

Major in Educational Leadership in the
Department of Graduate Education
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by

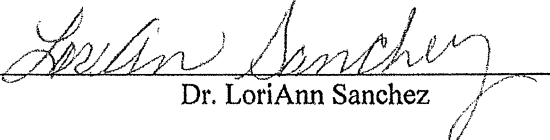
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May 2017

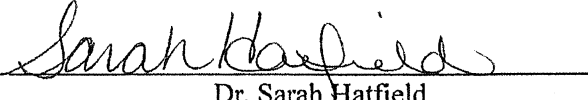
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AUTHORIZATION TO SUBMIT
DISSERTATION

This dissertation of Kristina Brinkerhoff, submitted for the degree of Doctor of Philosophy in Education with a major in Educational Leadership and titled ADVERSE CHILDHOOD EXPERIENCES: NEUTRALIZING IMPACT OF RESILIENCE has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies.

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ACKNOWLEDGMENTS

I owe a great deal of gratitude to my mother for never faltering in her belief that I was a “genius” and that she had “no idea where genetics came into play on that one.”

I believe that Northwest Nazarene University did much more than provide an excellent educational opportunity; this experience has also helped to lead me closer to Jesus Christ, my Savior. The professors consistently modeled the power that lay within the arms of our Savior, and through watching their relationship with him, my faith has been immensely intensified. I truly believe that I would not have been able to complete the arduous process without learning how to trust in the Lord. The longer I am a member of the community of Northwest Nazarene University, the more I am in awe of this institution. And because of that I would like to acknowledge my Lord, Jesus Christ, for the blessing he has bestowed on me and for his unwavering love.

DEDICATION

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ABSTRACT

Research surrounding the prevalence and impact of adversity during childhood has surfaced as a possible key to addressing the impact of chronic stress on children during their early years and well into adulthood. The research has suggested that when resilience is present, due to protective factors being in place, there may be neutralization of the negative impact and outcomes due to the physiological effects of chronic stressors. Identifying which protective factors have the greatest neutralizing impact may provide educators, physicians, and parents better aid in the prevention and healing of children who have been exposed to chronic adversity. This research provides insight into the negative impact of adversity and the neutralizing impact of resilience on physical, psychological, and emotional well-being.

TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
DEDICATION	iii
ABSTRACT	iv
Chapter I Introduction.....	1
Statement of the Problem.....	5
Background	7
Research Questions	9
Description of Terms	9
Significance of the Study	10
Overview of Research Methods.....	11
Chapter II Review of the Literature	14
Introduction.....	14
Prevalence of ACEs	15
ACEs and Brain Structure.....	19
Adversity and Stress	21
Protective Factors and Resilience	27
Impact of ACEs on School Success.....	37
Networked Ecological Systems Theory.....	39
Conclusion	41
Chapter III Design and Methodology	45
Introduction.....	45
Research Design.....	45

Participants.....	46
Data Collection	50
Analytical Methods.....	52
Role of the Researcher	53
Limitations	55
Chapter IV Results	56
Introduction.....	56
Results.....	57
Conclusion	67
Chapter V Discussion	69
Introduction.....	69
Summary of Results.....	71
Limitations	72
Quantitative Data	73
Major Findings.....	74
Conclusion	75
Recommendations for Further Research.....	77
Implications for Professional Practice	79
References.....	80
Appendix A Adversity and Resilience Survey	91
Appendix B Training Presentation.....	96
Appendix C National Institute for Health Certification.....	105
Appendix D Human Research Review Committee Approval	106

Appendix E Research Approvals	107
Appendix F Informed Consent Form	112
Appendix G Debrief Statement.....	115
Appendix H Member Checking E-mail	116

List of Tables

Table 1 <i>Example of ACEs</i>	17
Table 2 <i>Adaptive Systems Implicated in the World Literature on Resilience</i>	31
Table 3 <i>Organization of Protective Factors According to Ecological Model</i>	34
Table 4 <i>Framework of Ecological Systems Theory</i>	38
Table 5 <i>Demographics on Ex Post Facto Data</i>	57
Table 6 <i>Percentage of Students by Adverse Event Exposure Lifetime</i>	58
Table 7 <i>ACE Exposure Counts</i>	59
Table 8 <i>ACE Exposure and Behavior</i>	61
Table 9 <i>ACE Score and Meeting School Performance Expectations</i>	62
Table 10 <i>Protective Factors Exposure</i>	64
Table 11 <i>Percentage Within Protective Factors and Meeting School Performance</i>	65
Table 12 <i>Protective Factors and Meeting School Performance</i>	65
Table 13 <i>Logistic Regression Predicting the Likelihood of Meeting School Performance Expectations</i>	67

List of Figures

Figure 1 <i>Structures of the Brain</i>	23
Figure 2 <i>Physiological Impact on the Brain</i>	25
Figure 3 <i>Balance Scale Graphic</i>	36
Figure 4 <i>Nested Model of Ecological Systems as Modified by Bronfenbrenner</i>	39
Figure 5 <i>Nested Model of Ecological Systems as Modified by Bronfenbrenner (Revisited)</i>	74

Chapter I

Introduction

Adversity during childhood, such as victimization, child abuse, divorce of parents, incarceration of parents, parental psychopathology or substance abuse, homelessness, or loss of a loved one through separation or death have been associated with an increase in risk gradient for mental health problems (Bick, Nelson, Fox, & Zeanah, 2015). When children are exposed repeatedly to stress-inducing situations during childhood, their body experiences physiological overdrive in the stress response systems (Bick et al., 2015; D'Aoust, 2008). This reaction creates an inability to respond appropriately and effectively to future stressors and disrupts what Bronfenbrenner described in his ecological systems theory as “The Family System,” or a microsystem of interactions between the individuals closest to the child (Nakazawa, 2015; Neal & Neal, 2013). Research has found that when exposure to adversity is cumulative, the trajectory of the possibility for success changes for a child, leading to negative implications for cognition and psychological functioning as an adult, poorer educational attainment, and lower financial stability, which in turn leads to a cyclical process of inequalities for the next generation (Bethell, Newacheck, Hawes, & Halfon, 2014; Center on the Developing Child [CODC], 2014; Teicher & Samson, 2016). This adversity during childhood has become known, as of late, as adverse childhood experiences (ACEs). Defined by the work of Kalmakis and Chandler (2014), ACEs are the events during childhood that can range from slightly severe to extreme and typically chronic, occurring in the context of the child’s family or social environment, in which harm or distress is experienced. The severity of the impact of adverse events has yet to be measured by scale. However, Kalmakis and Chandler (2014) noted that the impact disrupts a child’s physical or psychological health and development.

There has been a recent shift in the paradigm surrounding what skills and knowledge children must emerge with from school. Although academic success is still valued, there is a very evident shift toward the importance of self-regulation skills (Bonnett & Maich, 2014).

One study found that abnormalities in brain structure that were attributed to psychiatric illness may in fact have a more direct link to abuse (Teicher & Samson, 2016). Studies that investigate the impact of maltreatment during childhood on the ability to respond appropriately to emotional stimuli potentially explain an increased psychological risk (Bick et al., 2015; Cowan, Callaghan, Kan, & Richardson, 2016). One study found that childhood maltreatment accounted for 45% of the population being diagnosed as having psychiatric disorders (Teicher & Samson, 2016). Difficulties in school must be viewed as a health and educational crisis based on the patterns of the diagnosis of psychopathology in adolescence being preceded by challenges or difficulties in school and social domains (DeSocio & Hootman, 2004; Tishelman, Haney, O'Brien, & Blaustein, 2010).

There is growing research to support that there may be significant and important differences in the brain development among maltreated children who also meet the criteria for psychiatric disorders and those who do not (Bick et al., 2015; Cowan et al., 2016).

Recent investigations around the consequences of the maltreatment on the structural properties of brain development have revealed that this maltreatment causes changes in the circuitries that are intended to support higher-level emotional and cognitive functioning (Bick et al., 2015, Teicher & Samson, 2016). Self-regulation skills begin developing early in a child's life (Perry, 2006). It is often unknown why someone becomes violent; however, research has shown that one of the six strengths for someone who is nonviolent is self-regulation (Perry, 2001; Van der Kolk, 2005). Positive external regulation by a caregiver begins the process of a child's brain

to take note of and control basic and complex needs and feelings (Perry, 2006). As the brain matures, if these skills are developed and maintained, the brain is able to initiate self-regulation skills automatically (Bonnett & Maich, 2014; Perry, 2006). School performance and the emergence or existence of mental health problems converge (DeSocio & Hootman, 2004; Walker et al., 2011).

In the late 1990s and into the early 2000s, the top two to three leading causes of death for children ages 5 and older were homicide or suicide; the proportion of youth with mental health concerns was 21% for ages 9–17 (DeSocio & Hootman, 2004); assault was the third leading cause of homicide in children ages 1–4; and suicide was the third leading cause of death for children ages 5–14, moving up drastically to homicide and suicide being the second and third causes of death for children ages 15–19 (Centers for Disease Control and Prevention [CDC], 2014; DeSocio & Hootman, 2004). In addition to severe occurrences of emotional and physical outcomes for children, in 1999, diagnoses of attention deficit disorders, oppositional defiant disorder, and conduct disorder affected more than 10% of children. Seventy-five percent of males and 67% of females involved with the juvenile detention center have underlying psychiatric disorders (DeSocio & Hootman, 2004).

As children develop, there are factors that either promote or encumber progress. Protective factors are one such factor. The more protective factors a child who is exposed to adverse encounters, the more the overall impact is neutralized, therefore providing a springboard for success in school and in life (CODC, 2014; Werner, 1989). Protective factors are influences that are associated with reducing the negative impact of exposure to adversity (Murray, 2003;). Our educational system can be the impetus for neutralizing the impact of ACEs by providing environments rich in emotional intelligence, relationships, and structures that build capacities for

protective factors (Perry, 2001). Protective factors have the capacity to neutralize the consequences of risk factors, therefore mitigating the effects of mental illness caused by a disruption in the physiological and biological development of a child due to exposure to chronic stress (Walker et al., 2011; Werner, 1989).

Currently, the diagnoses surrounding traumatic childhood events focus on symptoms of dysregulation, the inability to manage extreme emotional stress, disruptive behavior, somatization, disrupted relationships, and problems with self-identity (Ford et al., 2013, Werner, 1989). In 1995, Anda et. al., conducted an epidemiological study that exposed nearly two thirds of the participants had encountered at least one ACE. This study showed the number of ACEs a child experienced predicted the amount of medical concerns that would be prevalent as an adult (Nakazawa, 2015). In 2011–2012, the National Survey of Children’s Health found that 48% of children experienced one ACE and 22.6% of children experienced two or more ACEs (Bethell et al., 2014). While this diagnosis helps to provide identification and treatment, the diagnosis does not encompass the fact that traumatized children are prone to develop a dysregulation similar to those who are diagnosed with post-traumatic stress disorder (PTSD; Ford et al., 2013). However, PTSD does not fully account for the indicators specific to traumatized children, and the evidence of traumatization can be present in the absence of PTSD (Ford et al., 2013). The creation of a diagnosis of “developmental trauma disorder” would include symptoms of dysregulation in six distinct areas: affect, somatic, cognition, behavior, relationships, and self-identity (Ford et al., 2013). This can be recognized as a “silent epidemic of neurodevelopmental injuries” (Ford et al., 2013, p. 841). A U.S. district judge, Judge Michael W. Fitzgerald, ruled in favor of adding “complex trauma,” or repeated, chronic exposure to adversity, to the categorical list of eligibility criteria under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act

(Resmovits, 2015). This ruling is precedent setting and appears to move in the direction of recognizing the tremendous impact ACEs have on the physiological and psychological development of children. The court has yet to define what truly qualifies as enough adversity to warrant a disability, because children respond differently to different occurrences and the amount of exposure to ACEs (Kalmakis & Chandler, 2014). Research has shown the pervasive and negative impact of ACEs and has made a solid case for addressing adversity during childhood as an epidemic (DeSocio & Hootman, 2004; Stark, 2013).

This paper proposes that the negative impact of adversity can be measured utilizing the academic and behavioral success of students. The neutralizing impact of resilience on negative outcomes can also be measured using these indicators identifying the presence of protective factors or resilience (Perry & Szalavitz, 2008).

This research study investigated and examined the correlation between ACEs, protective factors, and school success. First, the study investigated the impact of the stress caused by ACEs on the academic and behavior success of children. Second, it examined what protective factors are and the post hoc impact they have on neutralizing the negative impact of ACEs on school success, as measured by academic indicators of performance. Using the brain research surrounding the impact of chronic stress on the brain, this research points to the fact that the brainstem (fight, flight, fear response) develops abnormally, therefore creating an imbalance in the way that the child responds to future stressors.

Statement of the Problem

In a study conducted by researchers in Washington State, ACEs were found to be one of the highest predictors of academic failure, second only to the identification of special needs (Stevens, 2013a). A study conducted by the National Survey of Children's Health found that

children had a higher chance of retention in the same grade for a second year, increased absenteeism, and disconnection from school as the rate of ACEs increased (Bethell et al., 2014). If schools address the archaic systems that are built on punitive forms of punishment and power-based methods of “controlling” students, the impact of what children experience outside of the school setting, at minimum, could be neutralized if not reduced significantly (Stevens, 2013a). If schools continue to utilize the traditional response to discipline infractions (suspending, expulsion, or exclusion), children will continue to be excluded and traumatized while being robbed of the opportunity to build the one thing they need to regain and rebuild resilience—relationships (Stevens, 2013a).

The primary purpose of this study was to bring additional attention to the most current research on the brain development of children and how this new information has the potential to change the current K–12 educational systems. Scientists have found that a chronically stressed brain releases chemicals that shrinks the hippocampus, the area in which emotion is processed, memory is formed, and stress is managed (Alberta Family Wellness Initiative [AFWI], 2017, Anda et al., 2006; Bick et al., 2015; Carrión, Haas, Garrett, Song, & Reiss, 2010; Nakazawa, 2015). We must interrupt the current “fast track” to failure that is created by the failure to focus on what children need, instead of blaming children for their “inability” to learn and conform (Irby, 2013; Stevens, 2013a, 2013b).

The results of this research point to changes needed in instituting policies, procedures, and practice that focus on providing access to protective factors for the children who attend our schools. Bronfenbrenner’s ecological systems theory identifies the interaction of the individuals within the educational policy-making network as an exosystem for the child (Bronfenbrenner, 2009; Neal & Neal, 2013). This exosystem has significant impact on the child through policies

affecting the child's experience within the school microsystem (Neal & Neal, 2013). If policy decisions focus on providing the individuals within the school microsystem (i.e., teacher, principal, coach, etc.) with the training necessary to improve the interactions between the child and his or her system, positive interactions during relationships can be strengthened, therefore providing the protective factors that are necessary to build resilience.

The presence of protective factors can provide the child with the skills necessary, so the negative impacts of adversity can be neutralized (Murray, 2003; D'Aoust, 2008). A child who enters adolescence with a history of ACEs and lacks a caring, consistent, and loving adult to help him or her through the ACEs is more likely to suffer from mood disorders, poor decision-making, and low executive functioning skills (D'Aoust, 2008; Nakazawa, 2015). Current research on the impact of resilience on neutralizing adversity points to the significant need for our schools to provide what many of our children lack: an environment in which caring, consistent, and loving adults are present (Nakazawa, 2015). This support has the potential to derail the negative trajectory for our children by creating a pathway to success through our K–12 educational system and beyond.

Background

Students are being excluded from our classrooms and schools each day at alarming rates due to their inability to conform to the traditional classroom model designed for the Industrial Age that required conformity, uniformity, and compliance. According to The Center for Civil Rights Remedies, during the 2011–2012 school year, 1,752,997 children in the United States received at least one out-of-school suspension (Data Resource Center for Child and Adolescent Health, 2012). When children face early adversity, their “default mode network” is thrown out of balance (Nakazawa, 2015). The normal brain's default mode network idles quietly in the

background, ready and waiting to help an individual process the environment and to help figure out what the next steps might be (Nakazawa, 2015). When this network is disrupted due to chronic adversity, it goes off-line and is no longer able to help determine what is important and what to do next (Nakazawa, 2015). This lack of support from the default mode network cripples the ability to respond appropriately to the world (Bick et al., 2015; Nakazawa, 2015). There must be a sense of urgency to address what the original ACE study by Kaiser Permanente's Health Appraisal Clinic during the mid-90s uncovered regarding how the children of today are being impacted by their environment and how this reduces their ability to self-regulate (Anda et al., 2006; Dong et al., 2005). It is imperative that educators look toward changing the schools to become environments that do not play the "blame game" and instead provide environments that are safe and nurturing, and most importantly, a place where misbehavior is seen as an opportunity to learn (Bailey, 2011). When educators approach misbehavior punitively, a trajectory can be created toward disconnection from school, a life paved with cycles of poor decision-making, a life of prison, and is ultimately wasted (Irby, 2013; Stevens, 2013a, 2013b). The United States has the most prisoners of any developed country in the world; more than 1.57 million inmates sat behind bars as of December 31, 2013 (Flatlow, 2014). This number is alarming, yet it does not paint the whole picture. Another 12 million individuals are estimated to cycle through the system each year without being accounted for in the final yearly total (Flatlow, 2014).

Research Questions

Creswell (2015) defined a research question as a means of narrowing the purpose by focusing on a few specific questions that the researcher hopes to answer through the research study. The research questions for this research study include the following:

1. What is the prevalence of ACEs in both urban and rural schools in the Pacific Northwest?
2. What is the relationship between ACE exposure and behavior?
3. What is the relationship between ACE exposure and academic success?
4. What is the relationship between resilience and meeting school performance expectations?
5. Is there a relationship between adversity, resilience, and academic performance?

Description of Terms

Researchers currently know more about the brain and how it develops than at any other time in history. With this new knowledge, educators must be moved to do things differently in the educational system. In order to make changes in our education system that reflect this new knowledge, it is important to begin to digest the information and take into account the urgency with which this issue is presented. Describing and defining terms adds clarity to a research study (Creswell, 2015). This section will define and describe several technical terms that are utilized throughout this paper.

Adverse childhood experiences. “Defined operationally as childhood events, varying in severity and often chronic, occurring in a child’s family or social environment that cause harm or distress, thereby disrupting the child’s physical or psychological health and development” (Anda et al., 2006; Kalmakis & Chandler, 2014, p. 1489).

Ecological systems theory. Model constructed by Bronfenbrenner in 1979 consisting of four environmental levels: the microsystem, the mesosystem, the exosystem, and the macrosystem. According to Bronfenbrenner's framework, each level has impact on the focal individual and the levels are nested within a concentric structure, starting with the microsystem (Onwuegbuzie, Collins, & Frels, 2013).

McKinney-Vento Homeless Education Assistance Improvements Act. Legislation reauthorized in January 2002 that requires schools and districts to uphold the educational rights and protections for children experiencing homelessness (Homeless, 2006).

Protective factors. Protective factors can be defined as positive experiences at the individual level that are associated with neutralizing the negative impact created by exposure to risk factors (Youth.gov, 2017).

Resilience. The "complex interaction of child characteristics, such as demeanor and physical appearance, and external supports including positive relationships, supportive family members and mentors, that buffer the effects of adverse situations that place children at risk of maladjustment and imbalanced emotional reactivity" (Prince-Embury, 2015, p. 56).

Significance of the Study

In 2007, approximately 200 million children under the age of 5 from low-income and middle-income countries were not meeting their developmental milestones, due to poverty, nutritional deficiencies, and lack of quality learning opportunities (Walker et al., 2011). Being in poverty exposes children to biological and psychological risk factors that may lead to inequalities during early development years (Walker et al., 2011). These inequalities interrupt educational attainments that impede adult productivity, thereby perpetuating the cycle of poverty (Walker et al., 2011). Experiences during early childhood years affect the development,

structure, and function of the brain (Bick et al., 2015; Szilagyi & Halfon, 2015). With cumulative exposure to negative or adverse experiences during childhood, the academic gaps between a child without adversity and a child with adversity widen, and success trajectories become more stagnant and immovable for those children experiencing chronic and cumulative ACEs (Walker et al., 2011). In order to effectively prevent adversity and subsequent inequalities, interventions must be in place as early as possible in a child's life. This prevention will change negative trajectories for children and provide the much-needed ability for them to care for the next generation.

The single most common finding is that children who have experienced adversity, yet were able to find a positive trajectory, have had at least one stable and committed relationship with a supportive parent, caregiver, or other adult (Bick et al., 2015; CODC, 2014). Positive perspectives on childhood experiences were found to correlate with social support, spiritual growth, and healthy behaviors in adulthood (Kalmakis & Chandler, 2014). Resilience and support networks were found to neutralize the effects of living in trauma created by violent families (Kalmakis & Chandler, 2014). The current research study provides insight into the impact of adversity on physical, psychological, and emotional well-being.

Overview of Research Methods

According to Onwuegbuzie, Collins, and Frels (2013), when a researcher wants to study two or more levels of Bronfenbrenner's ecological systems theory, the best methodology is a mixed design. By choosing a mixed-method design, multiple levels of interactions and settings could have been included in this research (Onwuegbuzie et al., 2013). However, due to the sensitive nature of the questions, the quantitative method was chosen. The quantitative approach methodology allowed for the opportunity to review the academic and demographic data for a

random sample of junior high students. In an explanatory correlational research study, random sampling should be utilized in order to generalize results to the population (Creswell, 2015). The sample consisted of 320 reports on children randomly selected from the rosters of sixth-grade through ninth-grade classrooms throughout the Pacific Northwest. The selection included both Title 1 and non-Title 1 schools.

A “sentinel” reporting method utilizes reports indicating the presence of known exposure. In this research study, ACEs were reported by school staff by utilizing a 10-item report originally modeled after the ACE survey (Felitti et al., 1998) and then adapted by Blodgett (2015). The first goal of this study was to collect data regarding the demographics of participants, as well as the prevalence of adversity. Data from this research reflected information in school records or factual professional knowledge by teachers, counselors, and building administrators. Teachers initially completed reports of known concerns regarding academic, health, and adverse events during childhood. The researcher trained school staff to report what was known and not to report opinions or suspicions, using a common reporting form and variable definitions. Reports were made as yes–no responses. No identifying information regarding students was collected. Student descriptive information reported was based on current knowledge, including grade, gender, race, free and reduced meal eligibility (a poverty indicator), and special education enrollment. School performance was reported through the documentation of problems that included currently not meeting grade-level expectations in one or more core subject areas, current attendance problems that interfere with academic progress, and current school behavior concerns that interfere with academic progress. Health concerns included seizure disorders, speech–language disorders, autism spectrum disorders, asthma, diabetes, obesity, food allergies, serious dental problems, other chronic health conditions identified by the school staff, and a pattern of students reporting

poor health. Adverse events included Child Protective Services (CPS) referral or placement; homelessness or high mobility (McKinney-Vento Act eligible); lack of basic needs, such as food, shelter, and water, that interfered with school success; parents' divorce or separation; death of a primary caregiver; family member incarceration; family member physical disability; family member mental illness; family member substance abuse; child witness of domestic violence; and child exposed to community violence.

The second goal of this study was to determine the impact of resilience (presence of protective factors) on student academic success, as measured by indicators of children not being at risk of failing classes or state tests even though these children had been exposed to ACEs. Again, utilizing the sentinel reporting method, professionals completed additional questions focusing on indicators of resilience in students, such as strong relationships with mentors, close peer groups, and involvement in extracurricular activities.

Explanatory correlational design was used to explain the correlation between ACEs, resilience (protective factors), and academic success. This design was chosen to explain the association between or among the variables mentioned earlier. The design was also intended as a means to analyze the relationship between two or more variables (ACEs, resilience, and school outcomes) to determine how they influenced each other (Creswell, 2015, p. 339).

Descriptive statistics and Pearson's correlation analyses were conducted to demonstrate which variables (adversity or protective factors) had the strongest correlation to student achievement, as measured by the responses from teachers regarding participants' academic standing (Laerd, 2015b). A *p* value equal to or less than .05 was considered significant, and statistical analysis was completed using IBM SPSS Version 24.0 (IBM SPSS, 2016).

Chapter II

Review of the Literature

Introduction

ACEs are chronic events that occur during childhood and have the potential to cause harm. The impact of this harm creates a disruption to a child's health and development (Bick et al., 2015; Nelson & Charles, 2015; Szilagyi & Halfon, 2015). ACEs occur in what Bronfenbrenner described as the ecological systems of the child: the individual, family, community, and society as a whole (Duerden & Witt, 2010). When exposure to adversity is cumulative, brain development is disrupted, leading to emotional and behavioral problems (CODC, 2015; Masten & Wright, 1998; Perry & Salavitz, 2008; Walker et al., 2011). The developmental risks that cause this disruption can be measured early in life, giving rise to the necessity for risk reduction efforts to focus on adverse events (Blodgett, Lanigan, Lohan, Short, & Turner, 2014).

Risk and resilience theory addresses what creates an environment that allows for individuals who have experienced adversity to ultimately find success (Benzies & Mychasiuk, 2009; Brooks, 1994; Jenkins, 2000; Masten, 2001; Masten & Obradović, 2006; Murray, 2003; Powers, 2010). The framework of this theory suggests that by increasing protective factors, the building blocks to resilience, individuals will be able to overcome a variety of risk factors, have success in the face of adversity, and disrupt the trajectory toward future problems that may develop from adversity (Benzies & Mychasiuk, 2009; Donnon, 2010; Greene, Galambos, & Lee, 2003; Szilagyi & Halfon, 2015). There is limited research on the neutralizing impact of resilience on ACEs. This study aimed to address this lack of research, and the researcher theorized that ultimately, if schools can serve as an environment for resilience that creates a system-wide

approach to providing access to protective factors, the detrimental impact of ACEs on children and society as a whole could be neutralized (Bynner, 2001). This literature review further investigated the prevalence of ACEs, the risk to development created by prolonged exposure to adversity, and stress and protective factors that may foster resilience.

Prevalence of ACEs

ACEs include the harmful acts to a child or the neglect of a child's needs, in addition to the familial and social-environmental influences on the child (Kalmakis & Chandler, 2014). A study conducted from 2005 to 2006 found that more than 1.25 million children in the United States experienced maltreatment (Sedlak et al., 2010). The majority (61%) of the incidents were neglect (Sedlak et al., 2010). An estimated 44% of children experienced abuse, while the majority (58%) experienced physical abuse, one-fourth experienced sexual abuse, and 27% experienced emotional abuse (Clarkson Freeman, 2014; Sedlak et al., 2010). Of the children who experienced neglect, almost one-half of them experienced educational neglect, 38% experienced physical neglect, and 25% experienced emotional neglect (Sedlak et al., 2010). By age 6, approximately 70% of children have experienced at least three or more ACEs (Clarkson Freeman, 2014). Surprisingly the National Incidents Study (NIS) found that there had been a 26% decline in the rate of overall harm standard maltreatment per 1,000 children in the United States (Sedlak et al., 2010). However, the number of incidents of endangerment standard maltreatment looks very different from that of the harm standard (Sedlak et al., 2010). Almost three million children were found to have experienced maltreatment who met the endangerment standard during the 2005–2006 study year (Sedlak et al., 2010). While 29% experienced abuse, 77% experienced neglect. Even though the number of incidents of endangerment standard was quite large, there was not a significant increase from 1993 to 2005–2006. Given this lack of

change, it is important to note that the number of incidence of emotional neglect has increased significantly (Sedlak et al., 2010). Table 1 provides some of the most prevalent examples of ACEs within the context of family, as well as in the social context that a child exists.

Table 1

Example of ACEs

Context	Adverse Childhood Experience
Within the family	Physical abuse
	Sexual abuse
	Emotional abuse
	Physical neglect
	Emotional neglect
	Physical punishment
	Witnessing domestic violence
	Household member's substance misuse
	Household member's illness
	Household member's incarceration
	Parental separation/divorce
	Child separation from family
	Social context poverty/socioeconomic stratification
Social context	Poverty/socioeconomic stratification
	Racial segregation
	Political conflict
	Hospitalization
	Community violence
	School violence/bullying
	Maltreatment by teacher
Natural disaster	

Note. Adapted from “Adverse Childhood Experiences: Towards a Clear Conceptual Meaning,” by K. A. Kalmakis and G. E. Chandler, 2014, *Journal of Advanced Nursing*, 70(7), 1489–1501.

According to Perry and Salavitz (2008), about 40% of American children will have at least one potentially traumatizing experience by the age of 18. In fact, a survey revealed that about 13% of children under the age of 17 reported they had experienced some form of serious maltreatment by adults within the past year (Perry & Salavitz, 2008). The most moderate estimates suggest that at any given time, more than eight million American children suffer from serious, diagnosable trauma-related psychiatric problems (Perry & Salavitz, 2008). Forty-eight percent of American children have been found to have at least one ACE based on data collected from the National Survey of Children's Health (Bethell et al., 2014). Throughout the nation, 22.6% of children from the ages of 0–17 were found to have two or more ACEs (Bethell et al., 2014). Most alarmingly, for children ranging from ages 12 to 17, 30.5% have had two or more ACEs (Bethell et al., 2014). Children who did not have ACEs were found to demonstrate resilience, as compared to children who have had ACEs (Bethell et al., 2014). Children who had two or more ACEs were 2.67 times more likely to be retained in a grade during school (Bethell et al., 2014). Children who did not have ACEs were 2.59 times more engaged in school, as compared to children who did have ACEs (Bethell et al., 2014). Resilience has been found to neutralize the impact of ACEs on grade retention and engagement in school (Bethell et al., 2014; Brooks, 1994). According to Bethell et al., (2014), children who demonstrated resilience were 1.55 times more likely to demonstrate engagement in school and 50% less likely to have repeated a grade.

Adversity during childhood is a significant public health concern, as indicated by the 3.7 million referrals to CPS in the United States each year (Burke et al., 2011). When children experience ACEs, they are at a higher risk for negative effects on health and behavior (Burke et al., 2011). In a study conducted by Burke et al. (2011), almost 50% of the samples of children

selected were found to have one or more ACEs. Alarming, nearly 12% had experienced at least four or more ACEs (Burke et al., 2011).

ACEs and Brain Structure

The risk and resilience model suggests that if a child possesses positive protective factors, the negative effects of risks associated with ACEs can be buffered (Powers, 2010). Research focused on the risk and resilience framework has provided substantial evidence that people are able to overcome a variety of risk factors, and with enough protective factors, problems developing from that adversity can be interrupted or prevented (Greene et al., 2003).

If a child has one ACE they are more likely to experience additional adverse experiences, (Clarkson Freeman, 2014) which may lead to residual restricted outcomes later in life (Bynner, 2001). Bronfenbrenner's ecological theory describes the influence of outside environments on the effectiveness and efficiency of functioning and adaptations of the individuals (Powers, 2010). According to Bronfenbrenner's theory, individuals are never independent of the systems within the social–environmental sphere; instead, they are a product of the interaction between and among these systems (Powers, 2010). There are five systems within Bronfenbrenner's ecological systems theory: (a) microsystems, the individual's immediate surrounding and patterns of interactions; (b) mesosystems, systems such school, church, and the neighborhood in which the individual exists; (c) exosystems, social settings that do not involve the individual directly; (d) macrosystems, the climate of society at large that includes cultural and social values; and (e) chronosystems, the timing of the development of the individual and its interaction with historical time (Powers, 2010).

According to Bronfenbrenner's ecological systems theory, the base level is the microsystem. This is the system in which patterns of behaviors, roles, and relational experiences

within a setting are considered. The individual plays a direct role in the experiences and how he or she interact with others. This is illustrated through the context of the family in which the child interacts on a daily basis through everyday events such as meals and playing (Neal & Neal, 2013). The mesosystem refers to the interactions between two of the settings in which the individual exists, such as the school and the home (Neal & Neal, 2013). The exosystem refers to the system in which the mesosystems are nested, but most significant in this system is the individual does not directly participate (Duerden & Witt, 2010; Neal, 2013). The final system within ecological systems theory is the macrosystem. The macrosystem refers to the culture or ideology in which the individual exists that has overarching consequences for how the individual interacts within the systems (Duerden & Witt, 2010; Neal, 2013). It is important to combine both Bronfenbrenner's ecological systems theory and the risk and resilience model in order to expand the focus of the research to the system's positive or negative impact on the individual (Corcoran & Nichols-Casebolt, 2004). It is necessary to understand how the child exists across all of the systems within the ecological systems theory, especially because of the impact each system has on the individual child (Duerden & Witt, 2010; Neal, 2013; Onwuegbuzie et al., 2013). By addressing and intervening on each ecological system, protective factors can effectively ameliorate the effects of cumulative risks (Powers, 2010). It is imperative to look beyond the individual and address the lack of parenting knowledge and skill through interventions of increased parent-school involvement and home support in order to strengthen the child's mesosystem (Brooks, 1994). Exosystems should also be addressed by focusing on the impact they have on the individual child, providing appropriate changes in school climate, and addressing the lack of the system's capacity to meet the individual needs of the student through policy and funding decisions (Powers, 2010). Poverty is a common component in social

exclusion (Bynner, 2001). The connection of poverty and social exclusion is not a lack of resources but of familial relationship breakdowns (Bynner, 2001). These familial relationship breakdowns are integral to understanding the microsystems within Bronfenbrenner's ecological systems theory.

Adversity and Stress

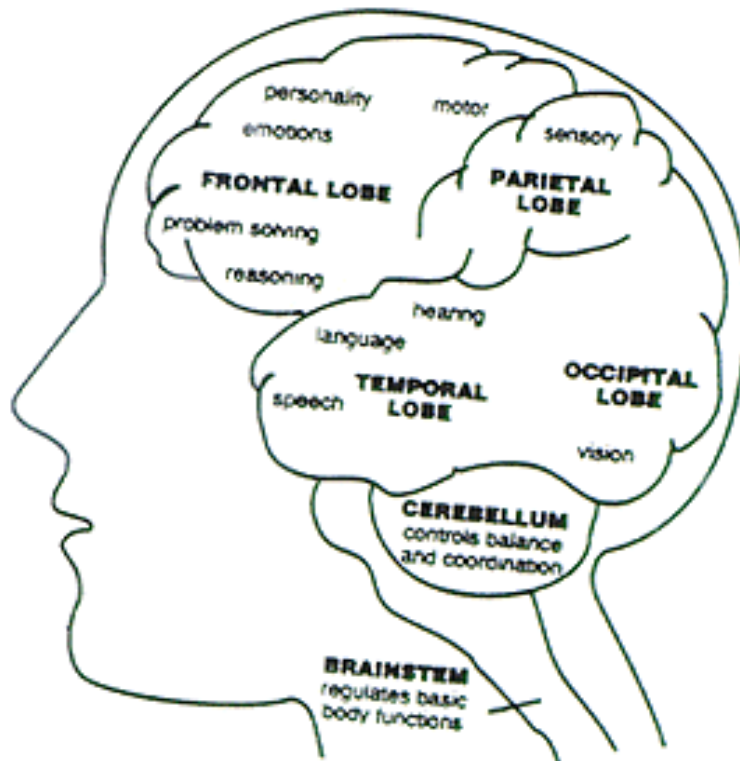
The human brain develops on a predetermined course beginning approximately two weeks after conception (Bick et al., 2015). This development is marked with genetically controlled production of synapses and a structured "pruning" of unused synapses (Bick et al., 2015). The pruning is primarily controlled by experience, therefore creating a refined, organized, and efficient system (Bick et al., 2015). The human brain is "wired" to expect certain experiences at certain times. A mature brain is developed when genetic and environmental factors interact over time (Bick et al., 2015). If there is a lack of expected input, the brain loses its ability to reach full potential.

The systems in the brain that are used often develop what Perry (2006) referred to as use-dependency (Duerden & Witt, 2010). This repeated use has a significant impact on the brain's operating systems. If there is an imbalance in the use of certain areas over others, the one that is used the most often is the one the system relies on for responses to stress. For example, if a child is in a constant state of fear, fight, or flight, their brain stem, or amygdala, is constantly in use. This overarousal creates a dysfunction in the child's response system, which is triggered by over 14,000 response chemicals flowing through the body upon the initiation of any perceived or real threat (Bailey, 2011; Nakazawa, 2015; Walker et al., 2011). While all of these chemicals are necessary for survival, the main chemicals are fairly common and very useful in times of stress. Cortisol, catecholamine, and endorphin all act as a catalyst for a person's most primitive safety

function (Bailey, 2011). In fact, these chemicals create reactions that serve to protect a person in times of danger and stress. However, children who experience a constant assault on their systems due to chronic stress have an overabundance of these chemicals pulsing through their systems, oftentimes rewiring connections, disconnecting the conversations between the brain stem and the prefrontal cortex, and creating misfires between signals in the brain (Bailey, 2011; Teicher & Samson, 2016). This constant flood of stress chemicals will develop an instant readiness or over-reactiveness. This can lead to emotional, behavioral, cognitive problems, and physical health problems including death (Bick et al., 2015).

Figure 1 depicts the structures within the brain and their individual purpose. It is important to understand the impact of stress on the brain stem. There are three major parts of the brain: brain stem, which is ultimately responsible for regulating the functions with the body; diencephalon and limbic systems, which operate the emotional responses that guide our behavior; and the cortex, “which operates the highly human functions, such as speech and language, abstract thinking, planning, and deliberate decision making” (Perry & Salavitz, 2008, p. 23).

Figure 1

Structures of the Brain

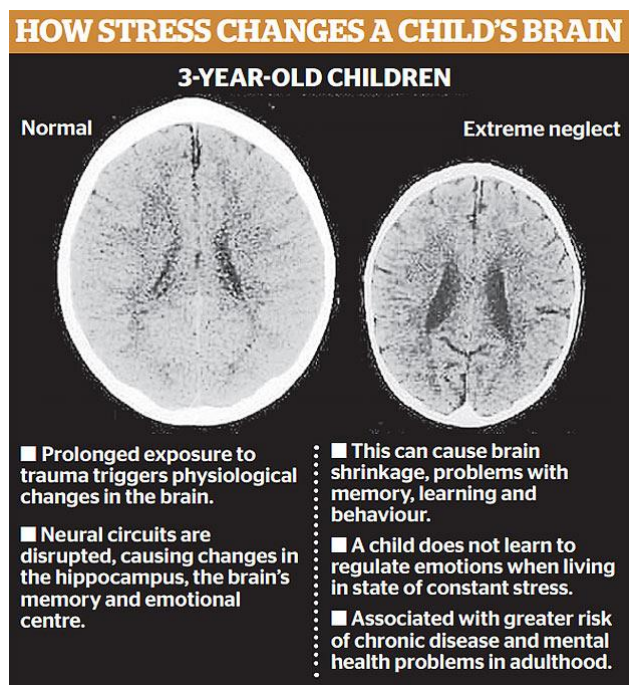
Note. The graphic illustration depicts the structures of the brain and their purpose (Lois Calder Memorial Library of the University of Miami School of Medicine, 1998).

According to Perry and Salavitz (2008), if children experience constant chaos and threat during their developmental years, their brain's stress response systems and those areas of the brain responsible for reading threat-related social cues will grow at a faster rate than the other areas of the brain. Children who are raised in settings determined to be in or below poverty experience settings that facilitate poor self-regulation skills (Walker et al., 2011). These settings are conducive to creating challenges in which it is difficult for children's basic needs to be met,

and they quickly learn to focus on the “now” in order to meet the immediate need at the cost of planning for their future needs (Evans & Pilyoung, 2013).

Poverty has been found to create an environment in which children are exposed to disadvantages that create a physiological response in the immune system cells (Evans & Pilyoung, 2013). The physiological response creates a faulty wiring in the immune system. This faulty wiring is due to the aggressive and constant attacks caused by chronic stressors from living in poverty (Evans & Pilyoung, 2013). Chronic cumulative stressors associated with living in poverty have been found to cause disruption or barriers between the systems in the self-regulatory processes that help children cope with external demands (Evans & Pilyoung, 2013). Poverty has been found to be associated with altered structures and functions of brain regions involved in stress and self-regulation (Evans & Pilyoung, 2013, p. 46). Exposure to chronic stress and impacts of low-income living also causes physical mutation of the brain. There is “reduced hippocampal volume, exaggerated amygdala responses, altered prefrontal cortex activity and structural changes in the brain, such as reduction in the physical structures of the brain” (Bick et al., 2015). Figure 2 depicts the physiological changes in the brain that occur when a child is exposed to an environment that is conducive to chronic stress.

Figure 2

Physiological Impact on the Brain

Note. The visual depicts how stress can change a child's brain (Stark, 2013).

There are three distinct types of stress: positive, tolerable, and toxic. Positive stress response is a normal and essential part of healthy development, characterized by brief increases in heart rate and mild elevations in hormone levels. Some situations that might trigger a positive stress response are spending the first day with a new caregiver or receiving an injected immunization. Tolerable stress responses activate the body's alert systems to a greater degree as a result of more severe, longer-lasting difficulties, such as the loss of a loved one, a natural disaster, or a frightening injury. If the activation is time limited and buffered by relationships with adults who help the child adapt, the brain and other organs recover from what might otherwise be damaging effects. Toxic stress response can occur when a child experiences strong, frequent, or prolonged adversity, such as physical or emotional abuse, chronic neglect, caregiver substance-abuse or mental illness, exposure to violence, or the accumulated burdens of family

economic hardship without adequate adult support. This kind of prolonged activation of the stress response systems can disrupt the development of brain architecture and other organ systems and increase the risk for stress-related disease and cognitive impairment well into the adult years (Bick et al., 2015; Nelson & Charles, 2015; Teicher & Samson, 2016).

When toxic stress response occurs continually, or is triggered by multiple sources, it can have a cumulative toll on an individual's physical and mental health for a lifetime (Carrión et al., 2010; CODC, 2015). The more adverse experiences in childhood, the greater the likelihood of developmental delays and later health problems, including heart disease, diabetes, substance abuse, and depression (Bethell et al., 2014; Bynum et al., 2011; Larkin, Felitti, & Anda, 2014). Research has also indicated that supportive, responsive relationships with caring adults as early in life as possible can prevent or reverse the damaging effects of toxic stress response (Bick et al., 2015).

In 1995 the ACEs study sought to define the associations between ACEs and adult health risk behaviors and disease (Felitti et al., 1998). There is a strong correlation between the exposure to abuse or household dysfunction during childhood and adults engaging in multiple risk factors for many of the leading causes of death (Felitti et al., 1998). Most interesting in the research finding is that although risk behaviors add to the “problem” related to early death or disease, this is not the sole cause of poor health in the adult life of children who have experienced adversity during their childhood (Felitti et al., 1998).

When a child experiences cumulative adverse experiences, such as physical or emotional abuse, chronic neglect, caregiver dysfunction, or substance abuse by caregivers, prolonged activation of the stress response systems can disrupt the physiological development of the brain structure, which increases the risk for stress-related disease and cognitive impairment well into

adulthood (CODC, 2015). When a toxic stress response occurs continually, or is triggered by multiple sources, it can have a cumulative toll on an individual's physical and mental health for a lifetime. The more a child experiences adversity in childhood, the greater the likelihood of developmental delays and later health problems, including heart disease, diabetes, substance abuse, and depression (Bick et al., 2015; Nelson & Charles, 2015).

Protective Factors and Resilience

If children experience a pattern of stress in a nurturing environment that is rich in protective factors, they will gain resilience strategies and be able to neutralize and or reverse the impact of ACEs (Greene et al., 2003). The way to neutralize risk factors is to counter them with protective factors (Bynner, 2001; Greene et al., 2003). This counteraction must be timely and addressed in a 1:1 ratio in response to each risk factor (Bynner, 2001). There is a need for lifelong, ongoing responses to risk factors and to address the ineffectiveness of traditional responses, such as counseling and individual-based therapy (Bynner, 2001).

Conversely, protective factors may have positive promoting effects on outcomes and may interact with risk factors to change or moderate their impact (Pollard, Hawkins, & Arthur, 1999). Protective factors appear to be the "building blocks" of resilience (Minnard, 2002). Both risk and protective factors can be traits within the individual or contextual factors of the environment (Fraser, 1997).

Research focused on the risk and resilience framework has provided substantial evidence that people are able to overcome a variety of risk factors (Brooks, 1994), and with enough protective factors, problems developing from that adversity can be interrupted or prevented (Greene et al., 2003). There is hope for children who are exposed to prolonged chronic stress. Research has indicated that supportive, responsive relationships with caring adults as early in life

as possible can prevent or reverse the damaging effects of toxic stress response. Ecological risk and resilience perspective merges Bronfenbrenner's ecological systems theory and the risk and resilience framework (Powers, 2010). Bronfenbrenner's ecological theory describes the influence of outside environments on the effectiveness and efficiency of functioning and adaptations of the individuals (Powers, 2010). According to Bronfenbrenner's theory, the individual is never independent of the systems within the social–environmental sphere; instead, they are a product of the interaction between and among these systems (Powers, 2010). Bronfenbrenner's five systems within the ecological systems theory include microsystems, the individual's immediate surrounding and patterns of interactions; mesosystems, systems such school, church, and the neighborhood in which the individual exists; exosystems, social settings that do not involve the individual directly; macrosystems, the climate of society at large that includes cultural and social values; and chronosystems, the timing of the development of the individual and its interaction with historical time (Powers, 2010). Risk and resilience perspective frames the idea that if an individual possesses both positive and protective factors, the adversity or risk factors within the social environment may be buffered, and therefore resilience can be encouraged (Mohr, 2002; Murray, 2003; Powers, 2010; Walker et al., 2011). Protective factors, the “structure” behind resilience, enables children to counter risk factors that are typically associated with negative outcomes (Mohr, 2002; Murray, 2003; Powers, 2010; Walker et al., 2011).

There are three categories of protective factors: individual, family, and external support systems. Individual factors include intelligence, temperament, and self-esteem. Family factors include the dynamics of the family, such as close relationships and caring systems. External systems include the societal supports, such as teachers or churches (Morrow, 2001). Given these protective factors, there is a greater likelihood for positive adaptability and stronger outcomes

(Morrow, 2001). Morrow discussed two theories within her theoretical framework: cognitive adaptation theory and survivor theory. As violence or trauma increases in life, the victims increase their help-seeking behaviors (Morrow, 2001). Some important protective factors, such as personal competence, sense of meaning, intelligence, and family characteristics, are necessary for an individual to be able to overcome the impacts of chronic and cumulative adversity (Morrow, 2001). Three out of four high-risk infants developed serious learning or behavioral problems (Werner, 1989). However, the remaining infant developed into a competent and resilient adult (Morrow, 2001). “Resilient adults have been found to have established a close bond with at least one caregiver” (Morrow, 2001, p. 10). Favorite teachers were found to be one such adult, creating the role of a positive force in the child’s life.

Resilience is not a trait but instead a broad concept that encompasses a positive pattern of adaptation when adversity is present (Masten & Obradović, 2006). If a child has been deemed “resilient,” two criteria must be met: the presence of a threat or adversity and the condition of adaptation and function in spite of that threat (Masten & Obradović, 2006). In relation to adaptation in school, a child must display external adaptation skills (Masten & Obradović, 2006). If a child demonstrates psychological well-being or physical health, he or she has gained the necessary internal adaptation skills (Masten & Obradović, 2006).

There are two models of resilience, therefore two major approaches to studying resilience (Masten, 2001). A variable-focused model uses multivariate statistics that measure the linkages between the degree of risk or adversity, the outcomes, and the trajectory toward qualities that may function to compensate or provide projections from negative outcomes from adversity (Masten, 2001). This model maximizes statistical power and provides significant evidence for links between the predictors and the outcomes that may lead to implications for intervention

(Masten, 2001). However, this approach may fail to find patterns within the lives of people, leading to losing the sum of the story and overlooking indicators that may point to those who may be at greatest risk or neediest of the interventions (Masten, 2001). Person-focused models compare individuals who have different profiles, but have adversity that occur within or across time, based on criteria that measure the difference in resilient children and other groups of children (Masten, 2001). The person-focused approach maintains the variables as a whole within the natural setting and provides the research with common and uncommon patterns within the lives of the participants over time that may result from many episodes and constraints that weigh on development (Masten, 2001). However, this approach also focuses solely on the lived experience and may obscure the specific linkages that provide clues that are valuable and explanatory (Masten, 2001).

Adaptive systems (see Table 2) have been found to be crucial in the development of resilience (Masten & Obradović, 2006). If these adaptive systems are intact and functioning, individual resilience is present (Masten & Obradović, 2006). When adversity disrupts or destroys these systems, children's development is severely threatened (Masten & Obradović, 2006).

Table 2

Adaptive Systems Implicated in the World Literature on Resilience

Systems	Functions
Learning Systems of the Human Brain	problem solving, information processing
Attachment System	close relationships with caregivers, friends, romantic partners, spiritual figures
Mastery Motivation System	self-efficacy processes, reward systems related to successful behavior
Stress Response Systems	alarm and recovery systems
Self-Regulation Systems	emotion regulation, executive functioning, activation and inhibition of attention or behavior
Family System	parenting, interpersonal dynamics, expectations, cohesion, rituals, norms
School System	teaching, values, standards, expectations
Peer System	friendships, peer groups, values, norms
Cultural and Societal Systems	religion, traditions, rituals, values, standards, laws

Note. Adapted from “Competence and Resilience in Development,” by A. S. Masten and J. Obradović, 2006, *Annals of the New York Academy of Sciences*, 1094(1), 13–27.

Research has unearthed that resilience, which was once viewed as scarce, is in fact quite common (Masten, 2001). If systems of basic human adaptation are intact and protected, the likelihood of positive development is great even in the face of extreme adversity (Brooks, 1994; Masten, 2001). Resilience can be characterized as the phenomenon that occurs when there are “good outcomes in spite of serious threats to adaptation or development” (Masten, 2001, p. 228). There cannot be a consideration of resilience if there has not been a presence of threat (Masten,

2001). Resilience has been operationally defined by the measurement of indices of adverse life events, trauma within the community, low birth weight, divorce of parents, and calculation of cumulative risk that combines the risk factors (Masten, 2001). Research has found that risks usually co-occur, and the accumulation of the risks are related to an increase of poor outcomes on development as measured by multiple indicators, such as psychosocial competence, psychopathology, and health (Masten & Wright, 1998). There is controversy surrounding the indices used to measure resilience; the first is based on the relative definition of an individual's ability to maintain a record of meeting the expectations of the given society or culture, and the second, ideology, deems resilience as the absence of psychopathology (Masten, 2001).

Much too often, children are exposed to adversity in environments that do not afford protections of basic resources, opportunities, and experiences to nurture the development of adaptive systems (Masten, 2001). If adversity aims to undermine basic systems that protect them, then efforts that promote competence and resilience in children who face adversity should focus on strategies that provide protection or restoration to these basic systems (Masten, 2001).

Risk and resilience theory looks at what creates an environment that allows for people who have experienced adversity to have success in the face of that adversity (Greene et al., 2003). Research focused on the risk and resilience framework has provided substantial evidence that people are able to overcome a variety of risk factors, and with enough protective factors, problems developing from that adversity can be interrupted or prevented (Benzies & Mychasiuk, 2009; Brooks, 1994; Greene et al., 2003; Morrow, 2001; Rak & Patterson, 1996).

Schools that contain nurturing and supportive teachers have the capacity to foster resilience and can therefore help people become productive and connected adults (Greene et al., 2003; Prince-Embury, 2015). By utilizing a protective–protective model, research has indicated that for every interactive risk and outcome relationship, there was a decrease with each strength or resilience factor. Adolescents with positive situational and internal factors in their daily lives are inclined to lead prosocial or constructive lifestyles (Greene et al., 2003). Adolescents with the least number of developmental strengths are consistently found to engage in bullying and acts of aggression, in fact, three to eight times higher than those students with the most strengths (Donnon, 2010).

Resilience does not develop by evading risk but by increasing the application of protective factors (Benzies & Mychasiuk, 2009). By engaging these protective factors when facing adversity, there will be an increase in the strength to persevere through such situations (Benzies & Mychasiuk, 2009). Protective factors foster resilience, inhibit risk factors, and help modify or evolve responses to adverse events (Benzies & Mychasiuk, 2009; Rak & Patterson, 1996). Risk factors such as adversity increase the likelihood of poor outcomes (Benzies & Mychasiuk, 2009). The inverse of most risk indicators can create protective factors (Masten, 2001). Table 3 lists the 24 protective factors that have been found to foster resilience across three levels: individual, family, and community (Benzies & Mychasiuk, 2009; Rak & Patterson, 1996).

Table 3

Organization of Protective Factors According to Ecological Model

Domain	Protective Factors
Individual	Internal locus of control, emotional regulation, belief systems, self-efficacy, effective coping skills, increased education, skills and training, health, temperament, gender
Family	Family structure, intimate partner relationship stability, family cohesion, supportive parent–child interaction, stimulating environment, social support, family of origin influences, stable and adequate income, adequate housing
Community	Involvement in the community, peer acceptance, supportive mentors, safe neighborhoods, access to quality schools, child care, access to quality health care

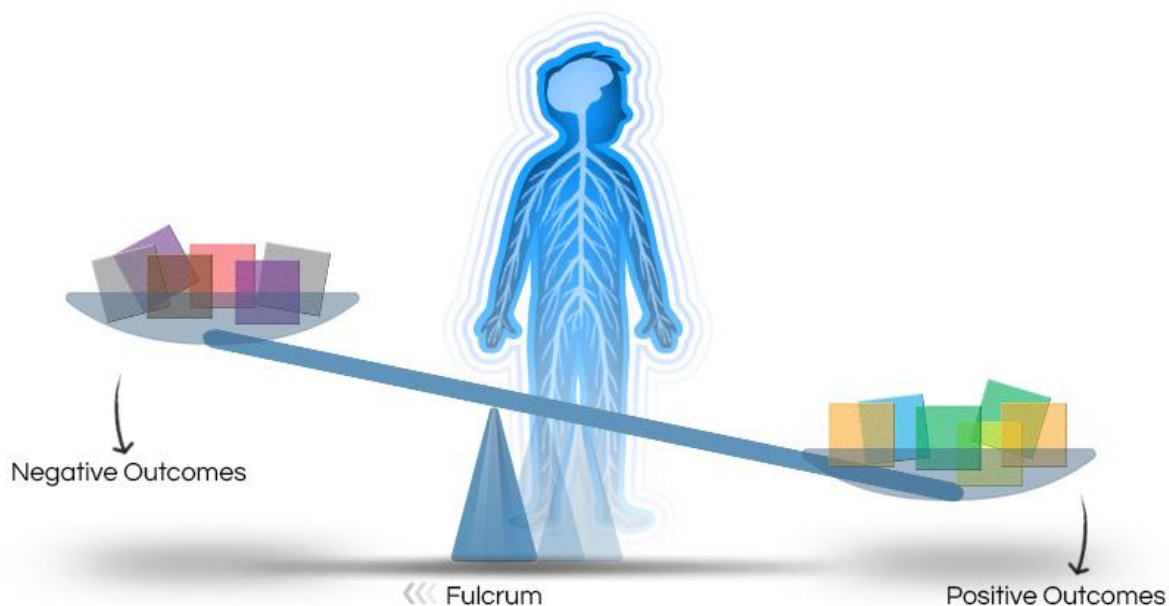
Note. Adapted from the Protective Factors and Ecological Model in “Fostering Family Resiliency: A Review of the Key Protective Factors, by K. Benzies and R. Mychasiuk, R., 2009, *Child and Family Social Work*, 14(1), 103–114.

The degree of importance for each protective factor is difficult to predict, just as the degree of impact of risk factors is nearly impossible to predict (Benzies & Mychasiuk, 2009). Also complicating this delineation is the complexity of the different domains of resilience. These domains include internal resources, familial resources, and societal resources (Brooks, 1994). Resilience in children is often coupled with a happy and positive temperament from birth (Brooks, 1994). This happy temperament causes a reciprocal response from caregivers, in turn increasing the “serve and return” response necessary to build connections (Brooks, 1994). In contrast, a child who is seen as “difficult” elicits a negative, even possibly angry response from caregivers, interrupting the connections necessary to build connections (Brooks, 1994). Temperament, higher intelligence, more executive functioning skills, cognitive-integrative abilities, higher social adeptness, and increased ability to cope have been

observed in more resilient children (Jenkins, 2000; Masten & Obradović, 2006). Resilient children also display a greater sense of self-esteem, which entails a feeling of realistic personal responsibility and hope (Brooks, 1994). If children come from an environment lacking warmth, structure, emotional support, and affection, they are more likely to be less resilient (Brooks, 1994). The characteristics necessary for resilience are promoted through supportive relationships with at least one person who accepts them unconditionally and loves them irrationally (Brooks, 1994).

Resilience is the combination of protective factors. Positive social experiences and biological factors alone will not suffice in countering the impact of chronic stress (Benzies & Mychasiuk, 2009; Masten, 2001). The single most common finding is that children who end up doing well have had at least one stable and committed relationship with a supportive parent, caregiver, or other adult (Morrow, 2001). The combination of supportive relationships, adaptive skill building, and positive experiences constitutes the foundations of what is commonly called resilience (see Figure 3). Resilience is the result of multiple interactions among protective factors in the social environment and highly responsive biological systems (Masten, 2001).

Figure 3

Balance Scale Graphic

Note. Graphic depicts the impact of resilience on outcomes (CODC, 2014).

Internal predispositions and external experiences impact intrinsic resistance to adversity and strong relationships with important adults in their family and community. Interaction between biology and environment builds capacity to cope with adversity and overcome threats.

Exposure to even one ACE increases the risk of poor childhood outcomes. Increasing protective factors have been found to neutralize the impact of ACEs (CODC, 2014). If a child is found to possess resilience traits, the oftentimes crippling effects of ACEs can be neutralized (Blodgett & Dorado, n.d.; Longhi, Barilla, Motulsky, & Frei, 2015). Research has suggested that if schools adopt systematic changes that create a culture sensitive to children with high levels of ACEs, resilience will be increased and student performance will improve (Burke et al., 2011; Longhi et al., 2015).

By teaching children skills that strengthen their social skills, determination skills, and engagement in society, as well as by providing close and supportive relationships with adults who model success and increase the opportunities for children to participate in prosocial organizations, they will succeed (Brooks, 1994). Resilience has been found to have a significant impact on the academic achievement and overall school performance (CODC, 2014; Longhi et al., 2015).

Impact of ACEs on School Success

Three out of four high-risk infants develop serious learning or behavioral problems (Werner, 1989). Difficulties in school need to be viewed as a health and educational crisis because the diagnosis of psychopathology in adolescence is frequently preceded by challenges or difficulties in school and social domains (DeSocio & Hootman, 2004). Adversity during childhood, such as victimization, child abuse, divorce of parents, incarceration of parents, parental psychopathology or substance abuse, homelessness, or the loss of a loved one through separation or death has been associated with an increase in risk gradient for mental health problems (DiSocio & Hootman, 2004). In 1999, diagnoses of attention deficit disorders, oppositional defiant disorder, and conduct disorder affected more than 10% of children. As many as 75% of males and 67% of females involved with the juvenile detention center have underlying psychiatric disorders (DiSocio & Hootman, 2004). “The relationship between mental health problems and school performance is bidirectional” (DeSocio & Hootman, 2004, p. 192). There is clear evidence that school performance and the emergence or existence of mental health problems converge (DeSocio & Hootman, 2004). According to the Centers for Disease Control and Prevention (2014, assault was the third leading cause of homicide in children ages 1–4, and suicide was the third leading cause of death for children ages 5–14, moving up drastically to

homicide and suicide being the second and third causes of death for children ages 15–19 (CDC, 2014). According to the Data Resource Center for Child and Adolescent Health (2011/2012), in 2011/2012, 35.8% of children below the national poverty line in the United States are at moderate to high risk of developmental, behavioral, or social delays (Data Resource Center for Child and Adolescent Health, 2012).

Developmental systems theory is a theoretical framework that proposes that as individuals interact with the environment, the interaction frames their development (Duerden & Witt, 2010). The development systems theory also proposes that development is positive when the interaction between the individual and his or her environment is the proper fit (Deurden & Witt, 2010). A key piece of resilience is relationships (see Table 4).

Table 4

Framework of Ecological Systems Theory

System	Impact
Microsystem	individual, intra-individual, and program-level characteristics
Mesosystem	other contexts (environments) inhabited
Exosystem	Systems that youth do not directly take part in but still influence their lives (teacher–parent), (teacher–principal)
Macrosystem	Society
Chronosystem	Over time

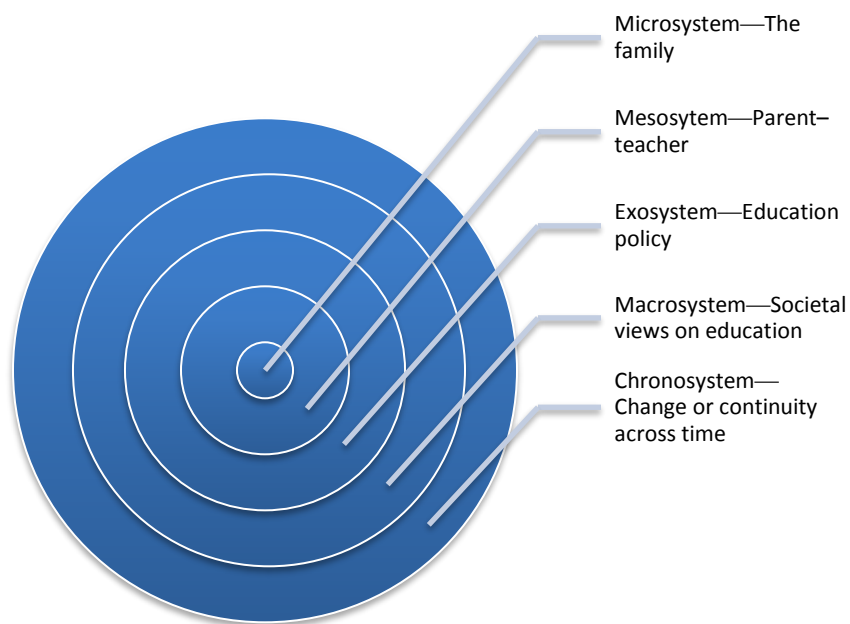
Note: Adapted from Bronfenbrenner’s ecological systems theory (Duerden & Witt, 2010)

Networked Ecological Systems Theory

Neal and Neal (2013) proposed a new view of Bronfenbrenner's ecological systems theory (see Figure 4). Bronfenbrenner's theory is one of the most utilized theoretical frameworks when researchers study individuals within ecological contexts (Neal & Neal, 2013). Instead of Bronfenbrenner's original formulation of nested levels of ecological systems, Neal and Neal (2013) redefined the model by viewing the systems as overlapping and connecting to each other directly or indirectly.

Figure 4

Nested Model of Ecological Systems as Modified by Bronfenbrenner



Note. The visual represents the five systems of the EST (Bronfenbrenner, 2009; Neal & Neal, 2013).

Neal and Neal (2013) suggested that viewing the ecological systems as nested takes away from the coherence that is embedded in the theory and concepts of ecological systems theory. Instead, they offered a networked perspective that inverts Bronfenbrenner's framework by

placing the primary focus on patterns of social interaction. Neal and Neal (2013) identified a microsystem as a setting, or the social interaction, between the people who are involved with the focal individual. A mesosystem becomes the interaction between individuals who exist in separate microsystems that involve direct interaction with the focal individual (Neal & Neal, 2013). An exosystem is a setting in which social interaction occurs that does not include the focal individual, but the participants do have direct or indirect interactions with the focal individual (Neal & Neal, 2013). Embracing this stance on Bronfenbrenner's ecological systems theory, Neal and Neal (2013) proposed that it is a more discreet way to analyze the development of the focal individual and how development may be influenced by microsystems, mesosystems, and exosystems. The forces that shape the interactions that become the settings for microsystems, mesosystems, and exosystems are referred to as macrosystems and chronosystems (Neal & Neal, 2013). Macrosystems can be articulated by viewing the set of social patterns that drive the formation or dissolution of social interactions between individuals. Homophily, an individual's tendency to secure and maintain interactions with others who exist within his or her same social status (e.g., poverty, race, gender, etc.), changes the interaction between the family microsystem and the school microsystem (Neal & Neal, 2013). Over time the interactions between systems change, and such changes impact the focal individual either positively or negatively. These interactions of changes over time are known as the chronosystems (Neal & Neal, 2013). Utilizing this framework, one would be able to capitalize upon the ability of the K-12 education system to address and neutralize the adversity that ultimately impacts and derails the trajectory for young children. Resilience will increase as developmental stages are met and adults and resources are available (Greene et al., 2003).

Conclusion

Many children in today's society, due to adverse experiences during their most formative years, live in a chronic state of dysregulation (Bailey, 2011; Ford et al., 2013; Perry, 2006; Walker, 2011). This chronic state of dysregulation leads to an overactive stress response system that causes children to respond utilizing their most primitive system, the brain stem. This reaction causes an uncontrolled retreat to the fight, flight, or fear control system. The Trauma and Learning Policy Initiative identified four domains impacted by trauma that interfere with success in schools: self-regulation, physical functioning, relationships, and academics (Tishelman et al., 2010). The traditional school discipline model utilizes a power model that relies on fear, control, and manipulation. This traditional model also approaches children as "good" or "bad" based on their behavior. Ironically, the same discipline model typically used in schools to get children to self-regulate, follow rules, attend to school work, and manage their behavior is causing a response that educators are unprepared to respond to in a productive manner. As Perry (2006) noted, when a child's fight, flight, or fear response system is repeatedly triggered by fear of punishment, this same system becomes automatically triggered regardless of an actual threat. Children become overreactive and the cycle is repeated, setting these children up for failure in schools.

A trauma-sensitive school has been found to be a significant factor in the increased levels of resilience among students (Blodgett & Dorado, n.d.; Greene et al., 2003; Longhi et al., 2015). Given the extreme stresses that many of our children experience, school can be a refuge (Bernard, 1993). Teaching children skills that strengthen their social skills, determination skills, and engagement in society, as well as by providing close and supportive relationships with adults who model success and increasing the opportunities for them to participate in prosocial

organizations, they will succeed (Bailey, 2011). Resilience has been found to have a significant impact on academic achievement and overall school performance (Longhi et al., 2015).

According to recent research, resilience has a neutralizing effect on an ACE in a school that provides a trauma-response setting (Blodgett & Dorado, n.d.; Longhi et al., 2015). If a school adapts systematic changes that create a culture that is sensitive to children with high levels of ACEs, resilience will be increased and student academic performance will improve (Longhi et al., 2015). Schools that contain nurturing and supportive teachers have the capacity to teach resilience and can therefore help people become productive and connected adults (Bernard, 1993).

The NIS provides a unique way of measuring and reporting incidents of child abuse and neglect in the United States (Sedlak et al., 2010). The reporter design focuses on children who have been involved in CPS reporting as well as children who have not been involved in CPS reporting, or those who have been screened out by CPS, but were recognized by community professionals as experiencing maltreatment (Sedlak et al., 2010). This methodology involves community professionals who work in certain categories of agencies where the professionals encounter children and families in the course of their daily jobs. These professionals, called “reporters,” serve as lookouts for children who may be experiencing abuse or neglect (Sedlak et al., 2010; WHO, 2014) These professionals include those working in public schools, medical services, law enforcement agencies, mental health agencies, public housing, shelters that serve runaway and homeless youth, as well as agencies that serve domestic violence victims (Sedlak et al., 2010; WHO, 2014. The standard definition of maltreatment, “physical abuse, sexual abuse, and emotional abuse,” is used as a measurement for classifying types of abuse (Sedlak et al., 2010, p. 3). Neglect is defined as “physical neglect, emotional neglect, and educational neglect”

(Sedlak et al., 2010, p. 3). Each criterion has a specific number of required features to help determine whether or not the incidence qualifies as reportable.

The NIS uses two definitional standards: the harm standard and the endangerment standard (Sedlak et al., 2010). The harm standard requires that the act or omission had to result in demonstrable harm (Sedlak et al., 2010). The harm standard has strong objectivity due to its rigid standards for meeting the criteria of harm (Sedlak et al., 2010). A limitation for the harm standard is rigidity and the potential exclusion of many children that CPS has substantiated as having experienced abuse or neglect (Sedlak et al., 2010). The NIS also utilizes the endangerment standard, which includes all children who meet the criteria for the harm standard, but also adds children who are not yet harmed by abuse or neglect, but the reporter thinks that the maltreatment is an endangerment to the child or CPS substantiates the report (Sedlak et al., 2010). The utility of the endangerment standard allows a slightly more lenient criteria than the harm standard. The Reporter Definitions Survey asks reporters who participate about their personal characteristics and backgrounds, demographic information, their training on reporting to CPS, their agencies policies on CPS reporting, their reporting history, and their work history (Sedlak et al., 2010).

The NIS-4 study found a reduction in the incidence of maltreatment since the previous study (NIS-3), as well as a reduction in the prevalence of specific maltreatment categories and increases in others (Sedlak et al., 2010). During the study year (2005–2006), more than 1.25 million children in the United States experienced maltreatment (Sedlak et al., 2010). The majority (61%) of the incidents were neglect (Sedlak et al., 2010). An estimated 44% of children experienced abuse, while the majority (58%) experienced physical abuse, one-fourth experienced sexual abuse, and 27% experienced emotional abuse (Sedlak et al., 2010). Of the children who

experienced neglect, almost one-half experienced educational neglect, 38% experienced physical neglect, and 25% experienced emotional neglect (Sedlak et al., 2010). There was a 26% decline in the rate of overall harm standard maltreatment per 1,000 children in the United States (Sedlak et al., 2010). This decrease met the threshold for close to significant, indicating the probability that the decrease was due to chance factors of less than 10% (Sedlak et al., 2010). The incident of endangerment standard maltreatment looked very different from that of the harm standard (Sedlak et al., 2010). Almost three million children were found to have experienced maltreatment that met the endangerment standard during the 2005–2006 study year (Sedlak et al., 2010). While 29% experienced abuse, 77% experienced neglect. Even though the number of incidents of endangerment standard was quite large, there was not a significant increase from 1993 to 2005–2006. Given this lack of change, it is important to note that the number of incidences of emotional neglect has increased significantly (Sedlak et al., 2010).

Reporters in schools alone recognize the majority of maltreated children (Sedlak et al., 2010). Given this opportunity to recognize and report incidents of maltreatment, this study found that 20% or less of the maltreated children recognized by school reporters received CPS investigation (Sedlak et al., 2010). Socioeconomic status was related to higher rates of maltreatment in all categories and both standards: five times the rate of other children, three times more likely to be abused, and seven times more likely to be neglected (Sedlak et al., 2010). In this study, the data showed two times higher incidence of all categories of endangerment standard in rural counties than in urban counties. This study used the reporter reporting method with data reflecting information in school records or factual professional knowledge.

Chapter III

Design and Methodology

Introduction

This current study is one of only a few to use a methodology that allowed the researcher to examine the relationship between ACE exposure and resilience in a nonclinical setting. A representative sample of middle school children in the public school setting was chosen utilizing a random sampling design. The risk of behavioral, attendance, and academic challenges was assessed utilizing quantitative data from a questionnaire. Reporters completed the survey on each participant. The researcher hypothesized that a dose-response effect would surface where there was an increase in ACEs, disruptive behaviors, school absences, and academic failure. In addition, the researcher also hypothesized that where the number of protective factors (resilience) increased, the negative impact of ACEs would be countered and possibly neutralized (Greene et al., 2003).

The questions guiding this research study were the following:

1. What is the prevalence of ACEs in both urban and rural schools in the Pacific Northwest?
2. What is the relationship between ACE exposure and behavior?
3. What is the relationship between ACE exposure and academic success?
4. What is the relationship between resilience and meeting school performance expectations?
5. Is there a relationship between adversity, resilience, and school performance?

Research Design

According to Onwuegbuzie et al. (2013), when the researcher wants to study two or more levels of Bronfenbrenner ecological systems theory, the best methodology is mixed design. This

study analyzed the microsystems, mesosystems, and exosystems of Bronfenbrenner's ecological systems theory. However, due to the sensitive ethical concerns related to reporting incidents of child neglect or abuse, the researcher chose to utilize quantitative methodology. The quantitative approach methodology allowed for the opportunity to determine the correlation between the variables involved in this study (Creswell, 2015).

Participants

In an explanatory correlational research study, random sampling should be utilized in order to generalize results to the population (Creswell, 2015). Students were randomly selected from coded student rosters provided by the participating schools from teachers' classrooms in which the teachers had volunteered to participate in the study. One-third of the students from each roster were selected based on every third position, and then a randomization of those students was utilized to insure anonymity. Each student was then given a unique study identifier in order to provide anonymous results to the researcher. The researcher provided a secure link to a Qualtrics survey form. The reporter used the survey form to enter data that were collected from the adversity and resilience questionnaire (see Appendix A). The data were then accessed from the database as sets for analysis.

The researcher spent two years studying ACEs, brain state models, and resilience and protective factors. In order to gain a better understanding of how these factors impacted each other and how this information impacted the knowledge of educators, the researcher sought out multiple opportunities to discuss and present information relative to the subject of this study. The researcher consulted with Christopher Blodgett out of Washington State University, a pioneer in using the sentinel method to study the prevalence and impact of ACEs on students and school

success. Blodgett expressed a willingness to share his expertise and materials with the researcher in order to maintain validity and reliability.

Prior to data collection, the researcher traveled to each site to provide one hour of training to the participating reporters. This training provided insight to the questions, the reporting process, and what factual knowledge was based on who disclosed the “known” report of adversity (see Appendix B). Data consisted of information that already existed within the knowledge of the school personnel, either due to the daily routines or disclosure from the child, CPS, or family members. The researcher did not solicit any additional information from children or caregivers.

To ensure ethical practices and procedures were used in this research study, and most importantly, to protect the participating students and school personnel, the researcher made every effort to safeguard the anonymity of students. This was in line with the requirements set forth in the Family Educational Rights and Privacy Act (FERPA). FERPA has outlined clear guidelines that allow a research study that is conducted in an educational setting to collect student data if the study does not permit personal identification of parents and students by individuals; there is a clear plan to destroy information once it is no longer needed; and there is a written agreement that clearly specifies the purpose, scope, and durations of the study, as well as clarification regarding specific information that will be disclosed (U. S. Department of Education, 2016).

ACEs that occurred during the student’s lifetime were categorical in nature and were documented as having occurred or not occurred, using the criteria of CPS referral or placement, homelessness or high mobility, deprivation of basic needs that impeded school success, parental divorce or separation, death of a primary caregiver, incarceration of a family member, physical

or mental disability of a caregiver, substance abuse by a caregiver, and witnessing domestic or community violence. Details regarding the nature of adversity were not disclosed.

The three levels of protective factors—individual, family, and external support systems—were utilized to document the presence of resilience (Benzies & Mychasiuk, 2009). Indicators of resilience were documented using categories of *occurred* or *did not occur* based on the occurrence of indicators across the three levels. In order to document indicators on the individual level, the reporter captured yes or no to the presence of student perseverance, emotional regulation, belief systems, self-efficacy, effective coping skills, and a positive temperament. At the level of family, the reporter indicated yes or no to the participant having three or more close friends, a stable and cohesive family structure, supportive parents, stimulating home environment, social support, stable and adequate income, and adequate housing. At the community level, the reporter answered yes or no to questions regarding participants having a positive adult mentor, being involved in the community, living in a safe neighborhood, having access to quality schools, and having access to quality health care.

School performance was reported by selecting whether or not there was documentation of failure to meet grade-level expectations, attendance concerns, and a prevalence of school behavior that interfered with academic success. Indicators of poverty were measured using free and reduced meal program eligibility, with 13.8 % of the students being eligible for free and reduced meal benefits.

Thirty-three, or 10.3% of students were eligible for special education services.

Student data that were descriptive in nature included

- grade,
- gender,

- free and reduced meal eligibility (a poverty indicator), and
- special education enrollment.

When using the selected methodology, there are selection criteria the researcher must be mindful of: (a) participant must be willing to engage in the study, (b) the adult reporters must have frequent access to the subjects they will be reporting on, (c) the professionals must be trained to recognize and report cases of the disease, and (d) there must be high-quality standards and processes for recognizing the disease (WHO, 2015). The sample consisted of 320 surveys from children who were randomly selected from the seventh- through ninth-grade student population from junior high–middle school settings in five urban–suburban school districts in the Pacific Northwest. The sites were chosen purposely based on a need to understand the problem and its impact on this region.

To ensure ethical research, training was completed by the researcher, and certification for human research through the National Institute of Health was acquired (see Appendix C). Consent to conduct the research was granted through the Human Research Review Committee at Northwest Nazarene University prior to conducting this study (see Appendix D).

Permission was given to conduct the research from the superintendents of five school districts (see Appendix E). Two superintendents in one state granted permission to conduct the study in their districts. three superintendents in the neighboring state granted permission to the researcher to conduct the study in their districts. Each of the five school districts was contacted personally by the researcher. Detailed information regarding the purpose, scope, and duration of the study was provided to each superintendent. Informed consent was collected from the participating school staff, including all reporters (see Appendix F). Debrief statements that included contact information were provided via e-mail (see Appendix G). Follow-up questions

were answered via e-mail and phone conversation when applicable. A member checking e-mail was sent to districts to thank them for their participation and to share with them the results of the study as a whole and with specific data relevant to their district (see Appendix H).

Data Collection

Data collection is an extremely important part of research, and every assurance of accurate data collection must be made to ensure the study will provide valid results. Surveys were used at each school. The data for this study came from a 31-item survey report that was modeled on the original ACE survey and adapted by Blodgett. The researcher then modified the adapted version and included questions related to resilience. The information gathered reflected the prevalence of ACEs, presence of protective factors that serve as indicators of the presence of resilience, and indicators of successful school performance.

The protocols for each participant were created using the online data collection tool Qualtrics (Qualtrics, 2015). Randomly selected codes were generated using an online random code generator. Each reporter received a list of 15 codes. Reporters were asked to select every third student from their roster and assign them a code from the list provided. This multistep process provided an efficient method for reporters to complete the survey. The survey took, on average, 10 minutes to complete for each student. The average class size in this area was between 30 and 35 students. The reporters spend approximately 100 minutes to complete the surveys.

The surveys were completed during the months of October and November 2016. Reporters who completed the surveys gave consent, and all of the consent forms were signed and returned prior to reporters receiving the surveys. Permission from school district superintendents was received prior to conducting the interviews.

The manner in which data were collected differed based on individual schools. Reporters in some schools completed the reports individually, and then if the reporter needed to verify information, other staff could be consulted. Some schools chose to collect the data based on group conversations with their student problem-solving teams or through their response to intervention and instruction model.

Reporters were directed to provide only factual information that was known to them. Factual, or known, information could be gleaned from reports made by the children themselves, by the parents of the children, or made directly to school staff. Reports made to the school staff by social service agencies were also considered factual knowledge. Each time a yes was selected for a category of adversity, a score of 1 was assigned. If a no was given for a category of adversity, a score of 0 was assigned. The scores were then added together as a total ACE score for each child across his or her lifetime.

School performance was scored using a reporter's rating of concerns in three areas: academic failure, attendance, and behavior concerns. Concerns for academic success were identified utilizing state assessment data that indicated whether or not the child was meeting grade-level standards in literacy, writing, or math. Attendance problems were defined according to district-identified attendance policies. Districts have adopted policy relative to truancy, and each school district has the authority to script policy pertaining to district expectations. Behavioral concerns were defined based on the reporter consensus regarding a degree of internalizing or externalizing behaviors, as well as the utilization of any school- or district-determined parameters that defined behavior concerns.

Research has confirmed the impact that adversity has on development, including both physically and emotionally. Health concerns were listed, including seizure disorders, speech–

language disorders, autism spectrum disorders, asthma, diabetes, obesity, food allergies, serious dental problems, other chronic health conditions identified by the school staff, and a pattern of a student reporting poor health. There were limited data collected on health concerns. These data were not included in the analysis reports.

The collection window started when the researcher visited each site and received the signed consents from participants. Each site was informed that the data collection window would be open until November 31, 2016. The researcher began analyzing the 340 completed surveys in December 2016. Due to incomplete data, 24 cases were removed prior to the final data analysis.

Participation was voluntary for each reporter in the selected school sites. Participants signed the informed consent, indicating they were aware of the opportunity to withdraw at any time. Teachers, principals, and counselors were the only identifiable participants to the researcher; therefore, student and parent consent was not required or obtained. The data from the 340 minors that were involved in the study remained anonymous to the researcher. Anonymity was ensured by utilizing a random code generator to create codes for each student. The identity of students was not discernable to the researcher.

Analytical Methods

Student demographics, academic success measures, ACE scores, and resilience indicators were analyzed using IBM SPSS Version 24.0 to analyze the relationship between the variables. Research-based procedures were utilized to analyze the data. Correlational design was used to study the correlations between ACEs, resilience, and school outcomes. This design was chosen to relate two or more variables (ACEs, protective factors [resilience], and school outcomes) to see if the variables influenced each other (Creswell, 2015).

The predictive power of ACEs was tested for each of the following variables: academic success, attendance, behavior problems, and resilience, using binary logistic regression analyses when controlling for the level of ACE exposure dependent on the occurrence of no ACEs, one to two ACEs, or three or more ACEs. The number of ACEs was entered as a predictor in addition to student grade level, student gender, free and reduced meal enrollment status, and special education enrollment. When measuring academic success, school attendance, and school behavior concerns separately, the predictive significance of each variable was represented as an odds ratio controlling for the other variables.

Descriptive statistics and Pearson's correlation analyses were conducted to demonstrate which variables (adversity or protective factors) had the strongest correlation to student achievement, as measured by the responses from reporters regarding participants' academic standing (Tanner, 2012). A *p* value equal to or less than .05 was considered significant, and statistical analysis was completed using IBM SPSS Version 24.0 (IBM SPSS, 2016).

Role of the Researcher

Personal bias is a given when conducting research. The researcher had both personal and professional beliefs regarding adversity during childhood. The researcher's personal ACE score was quite high, and the researcher worked diligently to not only address the negative impact of exposure to adversity during childhood, but to also overcome the hurdles that are inherent in living an unsafe childhood. The researcher strongly believed that parents do the very best they can and that all parents love their children. However, the researcher just as strongly believed that everyone's best is not good enough.

As a foster parent for three little boys who had been in and out of the researcher's legal care for the past four years, the researcher had observed drastically different results based on the

ages and exposure to adversity, as well as protective factors. The youngest, who had just turned five years old, had spent the majority of his life in a loving, safe, and stable environment. He had been able to form healthy attachments to his foster parents and daycare providers. His experience had been one of a carefree infant, toddler, and preschooler. In spite of his very difficult start in life, he had been able to thrive. The researcher believed that his success was due, in large part, to the high number of protective factors that had been present in his life. His older brothers had very significant and lasting effects from the adversity they were exposed to, which was for a longer period and at greater severity than their younger brother. While they were finding more and more success each day, given more and more opportunities to access protective factors, they were both still in need of additional supports to help them address the negative impact of their early environment.

It is not difficult to see through this story that there is a high level of personal investment in understanding the impact of adversity and the neutralizing impact of protective factors in order to provide more and more children the opportunity to be successful, regardless of what happens to them in their home environment. Although, the researcher would love to be able to provide the loving, safe, and nurturing environment that is necessary for every child exposed to chronic adversity, that is just not a possibility.

On the professional front, the researcher had the opportunity to work in high-poverty schools in which it was very evident that the majority of students experienced many ACEs. The level of adversity students experience has implications toward the level of disruption and dysfunction that occurs in the classroom and school setting. The researcher had observed the negative impact that student behavior has on the individual student, the classroom, the school, and on the health and well-being of the classroom teacher. The researcher hopes to seek a

solution to this ongoing problem and have a positive impact on the lives of the people within a school setting and within communities.

Limitations

Creswell (2015) defined limitations as potential weaknesses or problems in the study that are identified by the researcher. Several limitations were identified by the researcher of this current study. The methodology chosen for this study was relatively new, and most importantly, this study was one of only a handful that had used this method within the school setting to report data relative to children. Further research utilizing this methodology will serve to strengthen the validity of utilizing this method within the context of the school setting.

This reporting method requires reporters to adhere closely to reporting information that is known to them and avoid reporting information that is conjecture or hearsay. Due to this limitation, the researcher provided onsite training on the meaning of “known information,” and gave several examples of known information.

Examining exposure to adversity in childhood presents many complications due to mandated reporting laws regarding child maltreatment. While the strategy of reporting addresses the ethical and reporting concerns, it also presents the possibility of the adults underreporting or hesitating because of a lack of confidence in the known adversity. Despite these concerns, studies conducted recently have demonstrated that professional reporting can be an effective strategy, and it may help to minimize the impact of intruding on children and families (Sedlak et al., 2010; WHO, 2014).

Although this study sought to correlate ACEs, resilience, and meeting school performance expectations, much is still unknown about the degree of each variable and the balance that may be needed to impact academic success (Bethell et al., 2014).

Chapter IV

Results

Introduction

There is an agreement that ACEs create disparities between and among populations (Walker et al., 2011). Although, more research is necessary, current research clearly has articulated that there is a relationship between exposure to adversity, prevalence of resilience, and their impact on outcomes. With a growing number of students exposed to adversity, a clear understanding of this relationship is key to ensuring the best possible outcomes for our nation's children.

The questions guiding this research study were:

1. What is the prevalence of ACEs in both urban and rural schools in the Pacific Northwest?
2. What is the relationship between ACE exposure and behavior?
3. What is the relationship between ACE exposure and academic success?
4. What is the relationship between resilience and meeting school performance expectations?
5. Is there a relationship between adversity, resilience, and school performance?

Chapter IV offers data analysis pertinent to each of the previous five questions. These data were gathered from reports completed by teachers relative to the presence of known ACEs, academic and behavior outcomes, and demographic information. The sites for this research consisted of five districts throughout the Pacific Northwest. The data collected for this research study were quantitative in nature.

Results

The impact of exposure to ACEs has been widely debated and is still a topic of continued research and discovery. With the growing body of knowledge bringing to light the negative impact of exposure to chronic adversity on development, learning, health, and overall life outcomes, the discussion is changing because of an awareness of the desperate need for early interventions (Bailey, 2011 Perry, 2006, Walkley & Cox, 2013).

Research question 1: What is the prevalence of ACEs in both urban and rural schools in the Pacific Northwest?

The results of 320 ex post facto student records were analyzed using descriptive statistics. Table 5 provides a look at demographics. Ethnicity was not included due to an error on the survey that did not include the option to select Hispanic/Latino.

Table 5

Demographics on Ex Post Facto Data

Variable	Number	Percentage
Male	172	53.8%
Female	148	46.3%
Sixth Grade	71	22.3%
Seventh Grade	119	37.3%
Eighth Grade	129	40.3%
Special Education Eligibility	33	10.3%
Free and Reduced Meal Eligibility	44	13.8%

Table 6 provides a demographic look at the percentage of the population that experienced each type of ACE exposure.

Table 6

Percentage of Students by Adverse Event Exposure Lifetime

ACE Exposure	Percentage of Students Exposed to ACEs
Parental Divorce/Separation	24.4
Residential Instability	8.04
Domestic Violence Witness	5.84
CPS Involvement	7.14
Substance Abuse in Family Member	6.82
Basic Needs Not Met	7.42
Mental Health Disorder in Family Member	5.92
Incarcerated Family Member	4.23
Loss of a Caregiver Due to Death	2.90
Community Violence	1.60

Note. $N = 320$

As compared to the data collected by the original ACE study conducted by Anda et al., (2006), the prevalence of ACEs in this study was significantly less. Anda et al., found that two out of three people had one or more ACE. In this dissertation study, only one in every three students had one or more ACE. It is important to note this may have been due to the limitation created by the short relationship between the teacher and the middle school student. This limitation will be discussed in greater detail in Chapter V of this dissertation. Due to the limited occurrences of five or more ACEs, the data were coded as the following: no known ACEs (226),

one to two ACEs (58), and three or more ACEs (36). Table 7 represents the prevalence of known exposure for each of the 10 types of adversity reported.

Table 7

ACE Exposure Counts

ACE Exposure Count	Number	Percentage	Original Kaiser- Permanente Study (CDC, 2014)
No Known ACEs	226	70.6	36.1%
1	45	14.1	26.0%
2	13	4.1	15.9%
3	14	4.4	9.5%
4	10	3.1	12.5% (Four plus)
5	6	1.9	
7	3	0.9	
8	1	0.9	
9	1	0.9%	
Total	320	100%	

In order to answer the five research questions within this study, descriptive statistics were analyzed, and a chi-square test and Pearson's Correlation were utilized to measure correlations. Pearson's Correlation is an effective way to find the relationship between variables that are normally distributed (Tanner, 2012). In this study, all variables were correlated with meeting school performance expectations to determine if there were significant relationships among the variables of academic success, ACE exposure, and resilience. A relationship among variables

was measured using a scale from 1 to -1. A small or weak relationship existed if the score was between .1 and .3 on the scale; a moderate or medium relationship existed if the score was between .3 and .5; and a large or strong relationship existed between variables if the score was larger than .5. For all relationships, the correlation determination or r^2 was calculated in order to control for variances that may have been present in the data (Tanner, 2012). If a p value of less than .05 was found, the results were considered to be statistically significant.

Research question 2: What is the relationship between ACE exposure and behavior?

There is a wealth of research surrounding behavior in schools. However, there are only a few that focused on the impact of ACEs on student behavior (Blodgett, 2015; Learn, 2014). One study found that when caregivers reported more ACEs, teachers tended to report more problem behaviors in their students (Learn, 2014). Exposure to adversity during childhood has been found to have negative effects on brain development, specifically in areas of the brain that regulate emotions and impulse control (Anda et al., 2006; Roos et al., 2016). ACE exposure causes a flood of stress chemicals through a child's system (Bailey, 2011; Nakazawa, 2015; Walker et al., 2011). Chronic cumulative stressors inhibit a child's ability to self-regulate and cope with the demands typically present in a school setting (Evans & Pilyoung, 2013). Without the ability to self-regulate, a child's ability to meet school behavior expectations is challenged (Evans & Pilyoung, 2013; Learn, 2014). Table 8 shows the correlation between a child's ACE score and the presence of behavior concerns.

Table 8

ACE Exposure and Behavior

Variable ($n = 320$)	Behavior Concerns
ACE Score	-.350**

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

The null hypothesis, $H_0 = p = 0$ was tested for this study. The null hypothesis stated that a correlation between ACE scores and behavior concerns did not exist. Correlations were calculated as cross tabulations utilizing the chi-square test with significance at $p < .05$. Teachers completed reports for 320 students based on their knowledge of behavior concerns for the students included in this study. The null hypothesis was rejected because the results of this study revealed a negative moderate correlation between the ACE score and the presence of behavior concerns for this population.

Research question 3: What is the relationship between ACE exposure and academic success? There is limited research in the area of adversity and its impact on school performance. There are numerous studies that confirm a relationship between adversity and cognitive development. When children experience chronic adversity, their cognitive development can be impaired (Perry, 2006; Walkley & Cox, 2013). For the scope of this study, teachers were asked to report known occurrences in three areas of school performance. School performance was measured in three areas of school indicators of success: academic success, significant attendance issues, and substantial behavior concerns (Bonnett & Maich, 2014). Meeting academic grade-level expectations was rated as yes based on the student meeting the adopted proficiency levels on state assessments. Attendance problems were defined as the student having a pattern of missing school that interfered with the student's ability to learn. School behavior concerns were

defined as the student demonstrating a present pattern of behavior that interfered with the student's ability to learn or behavior that disrupted the classroom (Blodgett, 2015). Research has suggested that there is a correlation between an increased incidence of ACE exposure and failing to meet successful school performance criterion (Bethell et al., 2014; Blodgett, 2015; Walkley & Cox, 2013).

The null hypothesis, $H_0 = p = 0$ was tested for this study. The null hypothesis stated that a correlation between ACE scores and meeting school performance expectations did not exist. Correlations were calculated as cross tabulations utilizing the chi-square test with significance at $p < .05$. Teachers completed reports for 320 students based on their knowledge of the students' school performance. The limitation present in this method of data collection will be discussed in greater detail in Chapter V of this study. Table 9 describes the significant correlations between the reported presence of ACEs and meeting school performance expectations.

Table 9

ACE Score and Meeting School Performance Expectations

Variable ($n = 320$)	Is the Student Meeting School Performance Expectations?
One or More Reported ACEs	-.321

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

The results demonstrate a correlation of statistical significance at $p < .01$. There is a negative moderate relationship between the ACE score and meeting school performance expectations of $-.321$. The researcher can say with 99% confidence that a relationship exists between the ACE score and meeting school performance expectations. Of the 320 reports, 57% of the students were meeting school performance expectations regardless of ACE exposure. Of the students who were reported to have no known ACEs, 64% were reported to be meeting

school performance expectations. In contrast, only 35% of the students who reported having one or more ACEs were meeting school performance expectations. For this correlation, the null hypothesis was rejected as there was a significant correlation between ACE score and meeting school performance expectations.

Research question 4: What is the relationship between resilience and meeting school performance expectations? Resilience is defined as the “complex interaction of child characteristics and external supports that buffer the effects of adverse situations that place children at risk of negative outcomes” (Prince-Embury, 2015, p. 56). Research has identified extensive lists of protective factors that can be present in the child’s family, school, and community, as well as internal characteristics that may affect the presence of resilience (Prince-Embury, 2015).

There has been little research addressing the relationship between ACEs and resilience and its impact on school outcomes. The developmental perspective refers to what Neal and Neal (2013) noted as a chronosystem: how an individual is changed over time by the impact of systems, such as mesosystems and exosystems. This study aimed to analyze whether or not the presence of protective factors that make up the presence of resilience can serve as a resource to children who are exposed to ACEs. Resilience is defined by the presence of protective factors (internal and external resources) that can aid in the protection against risk (Corcoran & Nichols-Casebolt, 2004). Data on known resilience indicators (protective factors) were reported by teachers on the same survey following reporting ACEs. Reporters completed 10 questions as yes or no, depending on their knowledge of the presence of such indicators. Resilience was measured using a 10-point scale similar to the original ACE survey scale. For each answer confirming the presence of an indicator of resilience, a point was assigned to that student. Student scores were

then placed in two categories: zero to five protective factors and six to 10 protective factors.

Table 10 shows the percentage of students with protective factor exposure.

Table 10

Protective Factors Exposure

Protective Factors	Percentage of Students by Protective Factors Exposure Lifetime
Three or More Close Friends	77.30
Stable/Cohesive Family Structure	67.09
Supportive Caregivers	76.75
Stimulating Home Environment	63.55
Social Support	75.40
Caregiver with Stable and Adequate Income	66.45
Adequate Housing	75.95
Positive Adult Mentor	76.90
Involved in the Community	62.97
Quality Health Care	75.72

Note. Prevalence of Protective Factors in Population

Without the presence of adversity, there cannot be a presence of resilience (Prince-Embury, 2015). In this study, the three most common protective factors were three or more close friends (77.30%), supportive caregivers (76.75%) and positive adult mentor (76.90%).

Based on the results of the descriptive statistics analysis, a presence of protective factors was found in the population sample. Table 11 describes the significant correlations between the reported presence of protective factors and meeting school performance expectations. Of the 320

reports, 65% of students who did not have more than five protective factors were not meeting school performance expectations. Conversely, only 32% of students reported to have at least six of the 10 protective factors were not meeting school performance expectations.

Table 11

Percentage Within Protective Factors and School Performance

Number of Protective Factors	Meeting School Performance Expectations		
	Yes	No	Total
Zero to Five	34.7%	65.3%	100.0%
	19.1%	48.2%	31.6%
Six to Ten	67.6%	32.4%	100.0%
	80.9%	51.8%	68.4%

For this research question, the null hypothesis tested was $H_0 = p = 0$. The null hypothesis stated that there was no correlation between resilience and meeting school performance expectations. Correlations were calculated as two-tailed probabilities with the significance at $p < .05$. The results (see Table 12) demonstrate a positive moderate correlation of statistical significance at $p < .309$. The null hypothesis was rejected due to the statistically significant finding.

Table 12

Protective Factors and Meeting School Performance

Variable ($n = 320$)	Is the Student Meeting School Performance Expectations?
Protective Factors	.309**

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

Research question 5: Is there a relationship between adversity, resilience, and school performance? For this research question, the null hypothesis tested was $H_0 = p = 0$. The null hypothesis stated that there was no correlation between ACE exposure, resilience, and meeting school performance expectations.

Binomial logistic regression estimates the probability of an event (in this case, not meeting school performance expectations) occurring (Laerd Statistics, 2015a). A binomial logistic regression was performed to ascertain the effects of ACE exposure and resilience when controlling for gender, eligibility for special education, and poverty, on the likelihood that participants would not meet all three indicators of academic performance. Academic performance was measured as students having met grade-level expectations on state assessments, not having behaviors that interfered with learning, and having regular attendance in school. In order for students to meet the criteria of school performance, they must have met all three indicators. There were two studentized residuals with values of 2.932 and 3.362 standard deviations that were kept in the analysis. The model explained 33% (Nagelkerke R^2) of the variance in meeting school performance criteria and correctly classified 73% of cases. Sensitivity was 92%, specificity was 36.5%, positive predictive value was 66%, and negative predictive value was 78.13%. Of the five predictor variables, only three were statistically significant: eligibility for special education, ACE exposure, and resilience (as shown in Table 13).

Table 13

Logistic Regression Predicting the Likelihood of Meeting School Performance Expectations

Category	<i>B</i>	<i>SE</i>	Wald	<i>df</i>	<i>P</i>	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Gender	.274	.264	1.071	1	.301	1.315	.783	2.207
SES	.369	.449	.676	1	.411	.691	.287	1.666
Sped	-2.248	.583	14.855	1	.000	.106	.034	.331
ACEs	-1.065	.250	18.077	1	.000	.345	.211	.563
Resilience	1.459	.284	26.359	1	.000	4.300	2.464	7.505

Note: Gender is for males as compared to females. Sped is Special Education.

Females had a 1.3 times higher odds of meeting school performance expectations. Students identified as being eligible for special education were 89% less likely to meet school performance expectations. Students eligible for free and reduced lunch were 30% less likely to meet grade-level expectations. Students with three or more ACEs were 65.5% less likely to meet grade-level expectations. Students with five or more protective factors (resilience) were more likely to meet grade-level expectations. A higher exposure to ACEs was associated with an increased likelihood of academic failure, but increasing protective factors (resilience) were associated with a reduced likelihood of academic failure. Due to the statistically significant findings, the null hypothesis was rejected.

Conclusion

Other studies, though limited, provide some support to the argument that exposure to adversity during childhood can be predictive of difficulty in succeeding in school (Blodgett, 2015; Walkley & Cox, 2013). Chapter IV provided a summary of findings from quantitative data

collections methods. Pearson's Correlations, chi-squared, and binomial logistic regression tests found statistically significant relationships between ACE exposure, resilience, and school performance expectations when controlling for gender and eligibility for special education services. This present study confirms a dose response relationship between ACE exposure and academic success, as well as a weak correlation between ACE scores, resilience, and a neutralizing effect on negative outcomes associated with failing to meet school performance expectations. The findings presented in this chapter will be expanded upon in greater detail in Chapter V. A closer look at how schools can embrace current research on the neutralizing impact of protective factors on the negative impact that early exposure to chronic adversity is needed. Research findings on the positive impact trauma-informed schools have on student success support the need for further discussion (Perry, 2006; Walkley & Cox, 2013).

Chapter V

Discussion

Introduction

In 1998, Anda et al., conducted a 10-question survey about childhood experiences. What they found proved to be groundbreaking. They discovered that ACEs can be linked with adult health and well-being. Over the years, the list of questions has expanded, but the survey ultimately describes the experiences children have in their family and social context (Kalmakis & Chandler, 2014). The 10 questions, referred to as ACEs, range from losing a caregiver due to death or incarceration to being physically or emotionally abused. Although there are only a few studies to date, the link between ACE exposure and outcomes is clear (Anda et al., 2006; Edwards, Dube, Felitti, & Anda, 2007). There have been limited prospective studies around the impact of ACEs on academic success (Bethell et al., 2014). This current study confirmed this relationship and addressed the additional impact of resilience as measured by the number of protective factors a child has as a resource for countering the impact of adversity (Corcoran & Nichols-Casebolt, 2004). As ACEs increase, the risk of academic failure also increases in middle school-aged children. The results support that an understanding of ACE risk and resilience can be useful for finding strategies to respond to children at risk of failure.

There is an urgent need for continued research in this field of study. It is clear that exposure to ACEs has an impact on a child's socioemotional development (Bailey, 2011; Clarkson Freeman, 2014; Perry, 2001). Based on these findings, it is crucial for CPS, as well as medical and educational providers, to increase their collaborative efforts in order to provide early detection, prevention, and interventions for children who are exposed to chronic adversity (Clarkson Freeman, 2014).

This study investigated the question surrounding the impact that exposure to adversity during childhood can have on school performance. Creswell (2015) recommended the use of both quantitative and qualitative methods, in combination, to help provide a much clearer understanding of the research problem rather than using either method by itself. However, due to the sensitive nature of examining adversity exposure in children, this study utilized a quantitative research method. Examining exposure to adversity in children creates complications for the adult reporters due to the mandatory reporting requirements for when child maltreatment is disclosed. There are additional concerns about introducing these topics to children without retraumatizing the child, or negatively impacting the relationship between the school and parents. This study focused on middle school students in grades 6–8. The target population may also add to underreporting due to the relatively shorter length of relationship the adult reporters have had with the students at the middle school level. Despite the constraints of this method of gathering data, the results of this study, as well as others, suggest that utilizing the reports of what educators know about a student can identify relative risk and resilience in a manner that reduces burden, intrusiveness, and unintended injury to the child or the relationships between families and the school.

This study utilized information already known to the educators. Each site received training in order to understand ACEs and resilience. It is important for educators to understand the significant resources that can be made available to at-risk children to expose them to protective factors that can combine to create a level of resilience (Powers, 2010). The school system has the rare opportunity to meet the needs of all children, regardless of the presence of development challenges due to exposure to adversity, by adopting trauma-informed practices that

can enhance the level of resilience present in the child's "toolbox" (Blodgett, 2015; Blodgett & Dorado, n.d.).

The research questions for this research study include the following:

1. What is the prevalence of ACEs in both urban and rural schools in the Pacific Northwest?
2. What is the relationship between ACE exposure and behavior?
3. What is the relationship between ACE exposure and academic success?
4. What is the relationship between resilience and meeting school performance expectations?
5. Is there a relationship between adversity, resilience, and school performance?

Summary of Results

This study investigated the relationship between school performance, exposure to ACEs, and the presence of protective factors. Each of the variables listed earlier plays an independent and dependent role in the impact each can have on school success or failure. In order to investigate these relationships, Pearson's Correlations, chi-squared, and loglinear regression tests were employed to test the results of 320 surveys that were completed by adult reporters who had a relationship with the students as educators. The reporters were asked to answer demographic data questions, known occurrences of exposure to ACEs, and known existence of protective factors for a randomly selected number of their students. The data were examined to determine the strength of relationships among the following variables:

- Number of ACEs
- Number of protective factors
- Socioeconomic status

- Gender
- Eligibility for special education
- Indicators of school performance

The survey was administered using Qualtrics, an online survey tool. Data gathered from the surveys were input into IBM SPSS Version 24.0 and analyzed utilizing Pearson's Correlation and loglinear regression tests.

Binomial logistics regression found three variables that were of statistical significance: (a) eligibility for special education services, (b) eligibility for free and reduced lunch, and (c) students with three or more ACEs. Students eligible for special education services were 89% less likely to meet school performance expectations. Students eligible for free and reduced lunch were 30% less likely to meet school performance expectations. Students with three or more ACEs were 65.5% less likely to meet school performance expectations. Students with five or more protective factors were more likely to meet school performance expectations. A higher exposure to ACEs was associated with an increased likelihood of academic failure, but increasing protective factors was associated with a reduced likelihood of academic failure.

Limitations

There were several limitations to this study. While the collection method was intended to protect both adults and children, using the knowledge of educators to report ACEs suggests a rather limited estimation strategy that potentially underestimates the severity of the risk in schools. Despite this limitation, the level of reported exposure was lower than other published studies. The reporting strategy was limited to middle schools that included sixth, seventh, and eighth graders. It is likely that this structure creates a challenge to gathering accurate data due to the limited time the middle school students have been in the care of the middle school teachers,

as compared with the opportunity for students to be in the same environment with adult reporters for up to seven years at the elementary level. The results of this study were consistent with similar studies, despite this limitation. While this study included data collected from six school districts throughout the Pacific Northwest, with potentially thousands of reports, the response rate fell short at 320. This sample size was sufficient for determining statistical significance, but generalization to other populations may be limited. A highlight of this study is that it found a statistically significant relationship between the presence of protective factors and positive school performance outcomes. There are very few if any studies that specifically address the interaction between the exposure to ACEs and the presence and impact of protective factors.

Quantitative Data

For this study, school performance expectations were defined as meeting three criteria:

- Not having attendance issues that interfere with learning
- Not having behavior concerns that interfere with learning
- Meeting grade-level expectations on state-adopted assessments

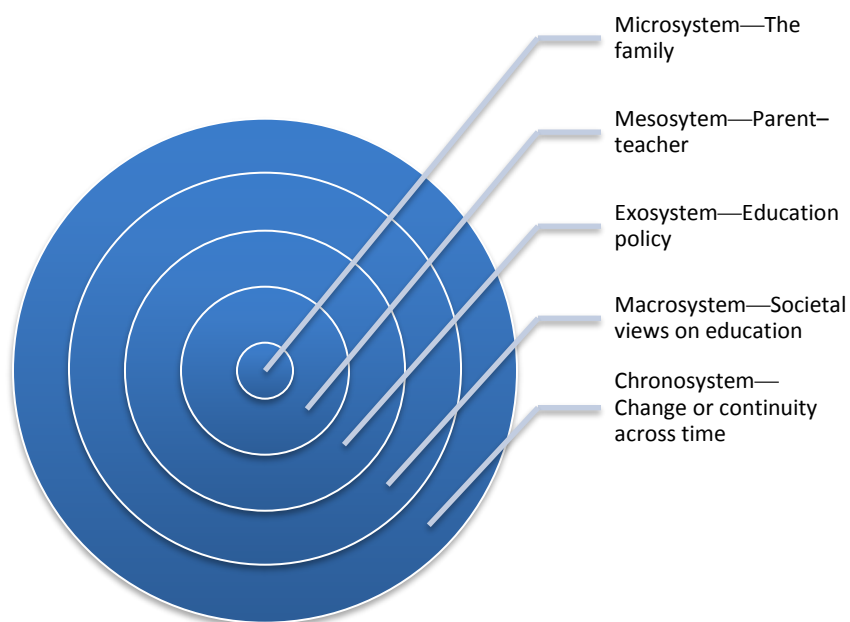
Randomly selected and coded student profiles were used to determine the prevalence of ACEs, socioeconomic status, eligibility for special education, presence of protective factors, gender, and school performance status. IBM SPSS Version 24.0 was used to calculate correlations (IBM SPSS, 2016). Table 13 displays the correlation matrix. This study tested the null hypothesis $H_0 = p = 0$. The null hypothesis stated that there was no correlation between ACE exposure, resilience, and meeting school performance expectations. The correlations were calculated as two-tailed probabilities with significance at $p < 05$. The results of this study found moderate to strong correlations between ACE exposure, resilience, and meeting school performance. Therefore, the null hypothesis was rejected.

Major Findings

The theoretical framework of Bronfenbrenner (2009) was utilized to better understand the impact a child's environment has on the ability to survive and thrive regardless of an exposure to adversity. Figure 5 illustrates the model of Bronfenbrenner's ecological system's theory that was shared in Chapter II of this study. The researcher felt that it was important to reflect upon the major findings in this study.

Figure 5

Nested Model of Ecological Systems as Modified by Bronfenbrenner (Revisited)



Note. The visual represents the nested model of ecological systems (Bronfenbrenner, 2009; Neal & Neal, 2013).

The major findings from this study connect directly to the microsystem, mesosystem, and exosystem of Bronfenbrenner's ecological systems theory. At the microsystem and mesosystem levels, children are directly impacted by their relationships with their immediate family and interactions in a variety of environments. This is the level at which ACE exposure has a direct

impact on the child. Question 1 of this research study, which focused on the prevalence of ACEs, found that one third of this population had at least one ACE. The findings related to resilience and the impact that protective factors can have on neutralizing the impact of adversity illustrate the importance of focusing on Bronfenbrenner's exosystem. Bronfenbrenner determined that there are systems in which an individual exists and that these systems impact each other and the individual child. The education system has an opportunity to serve as a system in which children are exposed to the protective factors, specifically the positive adult role model, that are proven to help neutralize the impact of adversity. The findings from this research study add to Bronfenbrenner's ecological systems theory through the following statements:

1. ACE exposure is common.
2. ACE exposure impacts a child's ability to meet school performance expectations.
3. Protective factors can counter the impact of adversity on meeting school performance expectations.
4. There is a correlation between ACE exposure, resilience, and meeting school performance expectations.

Conclusion

Of the 320 students included in the research study, 13.8% were reported to be eligible for free and reduced lunch. The results of this study show students eligible for free and reduced lunch are 30% less likely to meet grade-level expectations. While poverty is not synonymous with adversity, there is a clear correlation between living in poverty and the likelihood of exposure to adversity (Patterson, 2002). Directly connected to this is the finding related to ACE exposure and meeting school performance expectations. The results show that if a child has three or more ACEs, they are 65% less likely to meet grade-level expectations. Given these results, it

is imperative that researchers look for effective interventions that may provide training for parents and schools to help overcome the challenges created by low socioeconomic environments that lead to challenges for children.

There is reason to believe that the reporters were likely to underreport students who qualified for free and reduced lunch, because this is an area that is not typically known to educators due to confidentiality issues preventing the school administration from sharing this information with teachers. There is also reason to believe that students are not likely to share this specific information with teachers. Although there is a possibility that the true numbers were underreported, the results clearly point to a correlation between poverty and school failure.

Gender continues to play a role in determining outcomes for children. There are ongoing arguments as to which gender the current school setting is best suited. Advocates for both genders argue that their gender is at a disadvantage due to the current structures within the school setting (Cokley et al., 2015). Conventional wisdom holds that girls do better than boys in school. This study confirms that mind-set. Table 13 shows females being 1.3 times more likely to meet school performance expectations. The current population consisted of almost an even split between males (172) and females (148). While there have been many studies accounting for gender differences and outcomes, the results of this study support the gap between the academic success of boys and girls.

The 2011–2012 National Survey of Children’s Health found that the risk of negative school outcomes, such as absenteeism and grade retention, was associated with a higher incident of ACE exposure (Bethell et al., 2014). In their survey, 57% of students met school performance expectations regardless of ACE exposure. Of the students who were reported to have no known ACEs, 64% met school performance expectations. In contrast, only 35% of students reported to

have one or more ACEs met school performance expectations. Of the 320 students involved in this current study, 14% had three or more ACEs. Students with three or more ACEs were 65.5% less likely to meet grade-level expectations. Students with five or more protective factors were more likely to meet grade-level expectations. A higher exposure to ACEs was associated with an increased likelihood of academic failure, but increasing protective factors were associated with a reduced likelihood of academic failure. These results remained significant after controlling for additional threats to school performance, including gender, generalized poverty, and eligibility for special education. The finding in this study is similar to recent findings by Blodgett (2015).

Recommendations for Future Research

The prevalence of ACE exposure in subjects for this study suggests the need for awareness, prevention, and interventions. Seventy-one percent of students had no known ACEs. Recognizing protective factors as a resource to help at-risk students succeed has been overlooked (Christiansen & Christiansen, 1997). The results of this study confirm how important protective factors may be in addressing the needs of our most at-risk students. Students with five or more protective factors were almost 4.5 times more likely to meet the expectations for school performance. Sixty-five percent of students with fewer than six protective factors were not meeting school performance expectations. Conversely, 32% of students with six or more protective factors were not meeting school performance expectations.

Regardless of childhood experiences being positive or negative, these experiences have a remarkable impact on life outcomes, such as engagement in violence, health concerns, and opportunities for success (CDC, 2014). This study investigated the prevalence and impact of exposure to chronic adversity during childhood. Given the prevalence and intensity of the impact ACEs can have on life outcomes for students, it is imperative that future efforts are in place to

educate school systems and work towards providing social–emotional learning strategies as well as intentional efforts to increase resilience. These components are integral to trauma-informed schools. The school system is primed to provide prevention strategies to families, interventions for healing, and most importantly, education regarding the impact of adversity and the power of resilience. This current study confirmed what has been found previously: ACE exposure is common and pervasive nationwide (Anda, 2006; Bethell et al., 2014; Bynum et al., 2011). In the sample population for this study, one in every three students was found to have one or more ACE. One third of the population having one or more known ACEs is significant and can be considered pervasive based on the impact that ACEs have been known to have on successful outcomes for future generations. The risk for school performance failure increases exponentially as ACEs increase and protective factors do not increase accordingly. ACEs and protective factors occur within the child’s ecological systems (Duerden & Witt, 2010). Results of this study suggest there is hope for our most at-risk students regardless of where they come from and their experiences. When a child has been exposed to adversity, the negative effects may be neutralized by increasing the cultural resource of protective factors.

Given the impact that exposure to chronic adversity has on outcomes for children, the researcher encourages future research to be conducted on the impact of ACEs, resilience, and interventions that may prove effective at providing an environment that is conducive to fostering resilience. This will require an intense effort on behalf of educators and educational policy makers.

Implications for Professional Practice

Additional research may be necessary to determine effective professional development that will provide educators with the knowledge, skills, and mind-set required in school environments that are conducive to meeting the needs of our most at-risk children. It will also be important to focus on the ACE exposure of educators. This will prove to be a bit challenging, but if the research holds true, in high-stress situations, like classrooms with difficult behaviors, teachers who have experienced exposure to adversity during their childhood may have an overreactive response system as well. Further research is needed in order to explore the ACE exposure of educators and their ability to handle stressful behaviors from students.

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Appendix A

Adversity and Resilience Survey

* Factual knowledge includes child or parental report of experiences disclosed directly to school staff or notification by social service agencies such as CPS to school staff. Please complete the following survey for each of the chosen students in your class/on your roster based on your knowledge of the child and according to the above definition of factual knowledge.

* Required

Q 1. School Coded ID Number

Q 2. Student Coded ID Number

Q 3. Student Gender

- A. Male
- B. Female
- C. Other

Q. 4. Ethnicity

- A. American Indian or Alaskan Native
- B. Asian
- C. Black or African American
- D. Native Hawaiian or other Pacific Islander
- E. White (Caucasian)

Q. 5. Does the child have a pattern of absent days, late arrivals, or early dismissals (or any combination of these) that interfere with his/her learning?

- A. Yes
- B. No

Q. 6. Is there a current pattern of behavior either in the classroom or the school that interferes with the student's learning or disrupts the classroom environment?

- A. Yes
- B. No

Q. 7. Is the student meeting grade level expectations in reading, writing and math as measured by the Spring 2016 State Assessment?

- A. Yes
- B. No

Q. 8. Is the student eligible for the Free and Reduced Meal program?

- A. Yes
- B. No

Q. 9. Is the child eligible for Special Education Services?

- A. Yes
- B. No

Q. 10. Mark any known health concerns from the following list.

- A. Seizure disorder
- B. Speech/language disorder
- C. Autism Spectrum Disorder/Aspergers
- D. Asthma
- E. Diabetes
- F. Obesity
- G. Food Allergies
- H. Serious Dental Concerns

I. Other

Q. 11. Has the child ever experienced homelessness or high mobility?

A. Yes

B. No

Q. 12. Has the child ever been referred to CPS or been placed in an alternate home placement?

A. Yes

B. No

Q. 13. Has the child ever experienced not having their basic needs met to a degree that it interfered with school?

A. Yes

B. No

Q. 14. Has the child experienced parental divorce or separation?

A. Yes

B. No

Q. 15. Has the child lost a primary caregiver due to death?

A. Yes

B. No

Q. 16. Has any member of the family been incarcerated?

A. Yes

B. No

Q. 16. Has the child been a victim of community violence or witnessed community violence?

A. Yes

B. No

Q. 17. Has there been a diagnosis of mental illness in the child's family?

A. Yes

B. No

Q. 18. Has there been substance abuse problems in this child's family?

A. Yes

B. No

Q. 19. Does the child have 3 or more close friends?

A. Yes

B. No

Q. 20. Does the child have a stable/cohesive family structure?

A. Yes

B. No

Q. 20. Does the child have supportive caregivers?

A. Yes

B. No

Q. 20. Does the child have a stimulating home environment?

A. Yes

B. No

Q. 20. Does the child have social support?

A. Yes

B. No

Q. 21. Does the child's caregiver have stable and adequate income?

A. Yes

B. No

Q. 22. Does the child have adequate housing?

A. Yes

B. No

Q. 23. Does the child have a positive adult mentor?

A. Yes

B. No

Q. 24. Is the child involved in the community?

A. Yes

B. No

Q. 25. Does the child live in a safe neighborhood?

A. Yes

B. No

Q. 26. Does the child have access to quality health care?

A. Yes

B. No

Q. 27. Has the child ever experienced domestic violence or witnessed a family member being abused?

A. Yes

B. No

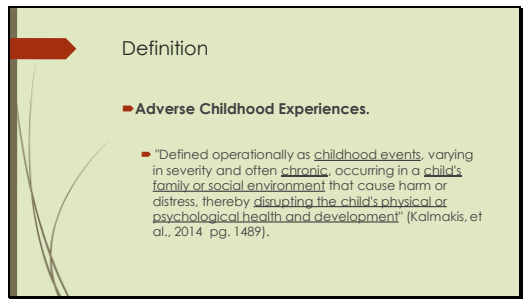
Appendix B

Training Presentation

Slide 1



Slide 2



Slide 3

Adversity

- Adversity during childhood has been associated with an increase in risk gradient for mental health problems (Desocio & Hootman, 2004).
- "Exposure to adversity in childhood violates children's basic human rights" (Jewkes, Dunkle, Nduna, Jama, & Puren, 2010).
- When we are exposed repeatedly to stress-inducing situations during childhood, our body experiences physiological overdrive in our stress response systems (Nakazawa, 2015).

Slide 4

Chronic Stress

- When exposure to adversity is cumulative, the trajectory changes for a child, leading to negative implications for cognition and psychological functioning as an adult, poorer educational attainment, and lower financial stability which leads to a cyclical process of inequalities for the next generation (Bethell, 2014; Center on the Developing Child, 2014).

Slide 5

Examples

Context	Adverse Childhood Experiences
Within the Family	<ul style="list-style-type: none"> Parental divorce Parental remarriage Physical neglect Emotional neglect Physical punishment Witnessing domestic violence Substance use Parental mental illness Household member's incarceration Parental substance use Parental marital conflict Social control Parental socioeconomic hardship
School context	<ul style="list-style-type: none"> Parental socioeconomic hardship Stigmatization Racial segregation Physical assault Harassment Community violence Childhood obesity/bullying Mistreatment by teacher Misbehavior

Slide 6

What ACEs look like...
Adverse Childhood Experiences



- 5 Personal—**
 - Physical Abuse
 - Verbal Abuse
 - Sexual Abuse
 - Physical Neglect
 - Emotional Neglect
- 5 Related to Other Family Members—**
 - Drug Addicted or Alcoholic Family Member
 - Incarceration of a Family Member
 - Loss of Parent to Divorce, Death or Abandonment
 - Mentally Ill, Depressed, or Suicidal Family Member
 - Witnessing Domestic Violence Against a Family Member

Dr. Nadine Burke Harris
Centers for Health Excellence

Slide 7

Adverse Childhood Experiences—ACEs
(Burke Harris, 2014)



Slide 8

Challenge ahead

- Adverse Childhood Experiences were found to be the **second highest predictor of academic failure** in a study conducted by researchers in Washington State (Stevens, 2013).
- Exposure to adversity is **second to only eligibility for special education services** (Stevens, 2013).
- A study conducted by the NSCH found that children had a higher chance of **retention, increased absenteeism, and disconnection from school as the rate of ACE increased** (Bethell et al., 2014).

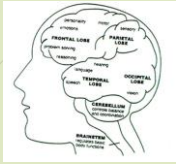
Slide 9

Impact

- If schools continue to utilize the traditional response to discipline infractions—suspension, expulsion or exclusion—children will continue to be traumatized and be robbed of the opportunity to build the one thing they need to regain and rebuild resiliency, relationships (Stevens, 2013).

Slide 10

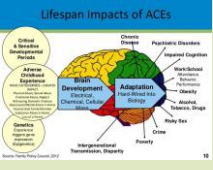
Brain State



(Lois Calder Memorial Library of the University of Miami School of Medicine, 1998).

Slide 11

Lifespan Impacts of ACEs



Slide 12

Brain State and Self-Regulation

- According to Perry & Salavitz (2006), if children experience constant chaos and threat during their developmental years, their brain's stress response systems and those areas of the brain that are responsible for reading threat related social cues will grow at a faster rate than the other areas of the brain.
- Children that are raised in settings that are determined to be in or below poverty experience settings that facilitate poor self-regulation skills (Walker et al., 2011).

Slide 13

Stress and Brain Change

HEALTHY BRAIN vs **RESULTS OF CHRONIC STRESS**

NEW FINDINGS CHANGE A CHILD'S BRAIN

3 YEAR OLD CHILDREN

- Children who experience chronic stress have a larger amygdala and hippocampus.
- Children who experience chronic stress have a smaller prefrontal cortex.
- Children who experience chronic stress have a smaller corpus callosum.
- Children who experience chronic stress have a smaller cerebellum.
- Children who experience chronic stress have a smaller brain overall.

Slide 14

Why this is important!

- Suicide is the 3rd leading cause of death in young people, taking the lives of nearly 4,400 children, with at **least half of those students committing suicide as a result of bullying** (Bullying Statistics, 2013).
- More than 160,000 children are absent from school due to bullying each year (Bernado R., 2015).
- Students that are bullies and or victims of bullying are found to experience poverty, fail at education, fail to maintain employment, are more likely to commit criminal activity, and to use/abuse drugs and alcohol (Bernado R., 2015).

Slide 15


Additional Statistics

- Every 17 seconds a child is arrested.
- Every 3 minutes a child is arrested for a drug offense.
- Every 6 minutes a child is arrested for a violent offense.
- Every 3 hours a child or teen is killed by a firearm
- Every 5.5 hour a child is killed by abuse or neglect
- Every 8 hours a child or teen commits suicide.

Resilience trumps Aces Manual

Slide 16


Tipping Point



Slide 17

Resiliency

- According to the Center on the Developing Child (2004), the more protective factors that a child who is exposed to adversity encounters, the more neutralizing the overall impact, therefore providing a springboard for school success (CCDC, 2004; Bynner, 2001).



Slide 18

Research

- Correlation between Adverse Childhood Experiences (ACEs), protective factors and school success.
- investigates the impact of the stress caused by ACEs on the physiological development of children.
- examines what protective factors are and the impact they have on neutralizing the negative impact of ACEs on school success as measured by academic indicators of performance.

Slide 19

Impact

- Research focused on the risk and resiliency framework has provided substantial evidence that people are able to overcome a variety of risk factors (Greene et al., 2003), and with enough protective factors the likelihood that later problems will develop from that adversity can be interrupted, and/or prevented (Greene et al., 2003).

Slide 20

Impact

- Research indicates that supportive, responsive relationships with caring adults as early in life as possible can prevent or reverse the damaging effects of toxic stress response.

Slide 21

Resiliency

- Current research on the impact of resiliency on neutralizing adversity points to the significant need for our schools to provide what at least half of our children lack, the environment in which caring, consistent and loving adults are present (Nakazawa, 2015).
- The result of this change can derail the negative trajectory for our children therefore for creating a pathway to success through our K-12 educational system and beyond.

Slide 22

Change in Action...

- <http://www.paper-tigers-movie.com>
- <http://www.acesconnection.com/clip/catching-up-with-kelsey-from-paper-tigers-pivot-2-02-minutes>

Slide 23

Research

- Retraumatization
- Mandatory reporting
- Anonymous
- Known ACEs
 - No wrong answer


Slide 24

Process

- Randomized list
 - Every 3rd student
 - Attach randomized code
 - Click on link
 - http://nu.c1.qualtrics.com/SF/SSID=5V_2t6A9CgmYd87U/
 - Enter_Tier/ta
 - Enter_Codes
 - Answer questions
 - Repeat until your list is complete

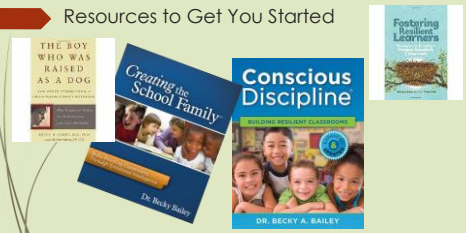
Slide 25

Questions



Slide 26

Resources to Get You Started



Free Online Book Study

Appendix C

National Institute for Health Certification

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Kristina Brinkerhoff** successfully completed the NIH Web-based training course “Protecting Human Research Participants.”

Date of completion: 03/23/2015

Certification Number: 1728926

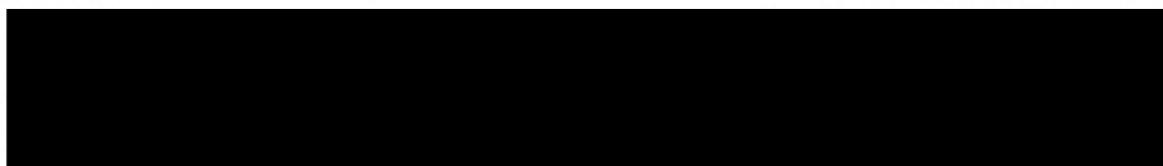
Appendix D**Human Research Review Committee Approval**

Dear Kristina,

The HRRC has reviewed your protocol: Protocol #8042016 -- Adverse Childhood Experiences: Neutralizing Impact of Resilience You received 'Full Approval'. Congratulations, you may begin your research. If you have any questions, let me know.

Heidi Curtis
Northwest Nazarene University
HRRC Member
623 S University Blvd
Nampa, ID 83686

Appendix E
Research Approvals



February 24, 2016

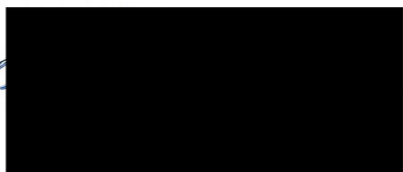
Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686


RE: Research Proposal Site Access for Mrs. Kristina L. Brinkerhoff

Dear HRRC Members:

This letter is to inform the HRRC Committee that Administration at [REDACTED] [REDACTED] has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mrs. Brinkerhoff has permission to conduct her research in the district of and with students and staff of [REDACTED]. The authorization dates for this research are July 2016 to April 2017.

Respectfully,





January 25, 2016

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686

RE: Research Proposal Site Access for Mrs. Kristina L. Brinkerhoff

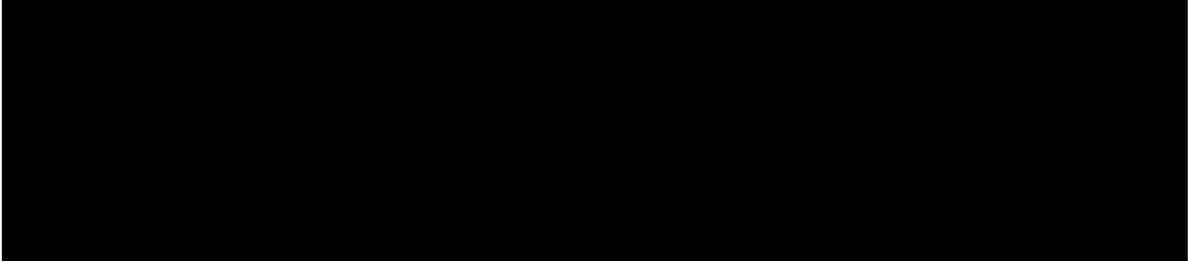
Dear HRRC Members:

This letter is to inform the HRRC that Administration at [REDACTED] School District has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mrs. Brinkerhoff has permission to conduct her research in the district of and with students and staff of the [REDACTED] School District. The authorization dates for this research are July 2016 to April 2017.

Respectfully,



[REDACTED]



December 9, 2015


Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686

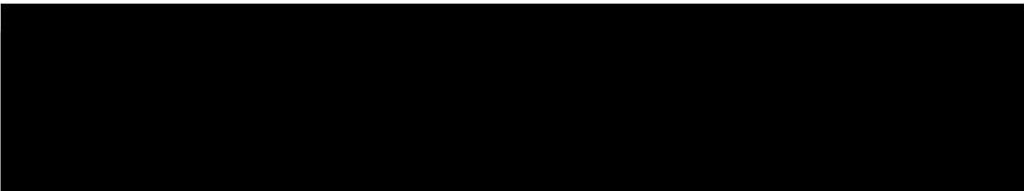
RE: Research Proposal Site Access for Mrs. Kristina L. Brinkerhoff

Dear HRRC Members:

This letter is to inform the HRRC that Administration at [REDACTED] School District has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mrs. Brinkerhoff has permission to conduct her research in the district of and with students and staff of the [REDACTED] School District. The authorization dates for this research are July 2016 to April 2017.

Respectfully,



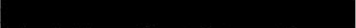



October 16, 2015

Northwest Nazarene University
Attention: HRRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686


RE: Research Proposal Site Access for Mrs. Kristina L. Brinkerhoff

Dear HRRRC Members:

This letter is to inform the HRRRC that Administration at 
No. 1 has reviewed the proposed dissertation research plan including subjects, intervention,
assessment procedures, proposed data and collection procedures, data analysis, and purpose of
the study. Mrs. Brinkerhoff has permission to conduct her research in the district of and with
students and staff of the . The authorization dates for
this research are July 2016 to April 2017.

Respectfully,





January 11, 2016

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686

RE: Research Proposal Site Access for Mrs. Kristina L. Brinkerhoff

Dear HRRC Members:

This letter is to inform the HRRC that Administration at [REDACTED] School District has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mrs. Brinkerhoff has permission to conduct her research in the district of and with students and staff of the [REDACTED] School District. The authorization dates for this research are July 2016 to April 2017.

Respectfully,



Appendix F

Informed Consent Form

A. PURPOSE AND BACKGROUND

Kristina L. Brinkerhoff, Ed.S., in the Department of Graduate Education at Northwest Nazarene University is conducting a research study related to awareness of the impact of adversity during childhood on a child's ability to find success both academically and behaviorally in a classroom setting, and how resilience formed through protective factors can neutralize the negative impacts and provide a safe and productive learning environment for all students in the classroom setting.. We appreciate your involvement in helping us investigate how to better serve and meet the needs of Northwest Nazarene University students.

You are being asked to participate in this study because you are a healthy volunteer, over the age of 18.

B. PROCEDURES

If you agree to be in the study, the following will occur:

1. You will be asked to sign an Informed Consent Form, volunteering to participate in the study.
2. You will be asked to participate in a brief training on reporting known incident of adverse childhood experiences and resilience factors.
3. You will complete a series of questionnaires based on your known professional knowledge of the selected students in the sample.

These procedures will be completed at a location mutually decided upon by the participant and principal investigator and will take a total time of about 145 minutes.

C. RISKS/DISCOMFORTS

1. Some of the discussion questions may make you uncomfortable or upset, but you are free to decline to answer any questions you do not wish to answer or to stop participation at any time.
2. For this research project, the researchers are requesting demographic information. Due to the make-up of Idaho's population, the combined answers to these questions may make an individual person identifiable. The researchers will make every effort to protect your confidentiality. However, if you are uncomfortable answering any of these questions, you may leave them blank.
3. Confidentiality: Participation in research may involve a loss of privacy; however, your records will be handled as confidentially as possible. No individual identities will be used in any reports or publications that may result from this study. All data from notes, audio tapes, and disks will be kept in a locked file cabinet in the Department and the key to the

cabinet will be kept in a separate location. In compliance with the Federalwide Assurance Code, data from this study will be kept for three years, after which all data from the study will be destroyed (45 CFR 46.117).

4. Only the primary researcher and the research supervisor will be privy to data from this study. As researchers, both parties are bound to keep data as secure and confidential as possible.

D. BENEFITS

There will be no direct benefit to you from participating in this study. However, the information you provide may help educators to better be prepared to meet the behavioral, social and academic needs of our most vulnerable children by having a clearer understanding of the cumulative impact of Adverse Childhood Experiences on their stress response systems.

E. PAYMENTS

There are no payments for participating in this study.

F. QUESTIONS

If you have questions or concerns about participation in this study, you should first talk with the investigator. Kristina L. Brinkerhoff can be contacted via email at kbrinkerhoff@nnu.edu, via telephone at 208-748-3700(W) / 208-413-2300 (C) or by writing: 39536 Blue Spruce Lane Lewiston, Idaho 83501.

Should you feel distressed due to participation in this, you should contact your own health care provider.

G. CONSENT

You will be given a copy of this consent form to keep.

PARTICIPATION IN RESEARCH IS VOLUNTARY. You are free to decline to be in this study, or to withdraw from it at any point. Your decision as to whether or not to participate in this study will have no influence on your present or future status as a student at Northwest Nazarene University.

I give my consent to participate in this study:

Signature of Study Participant

Date

Signature of Person Obtaining Consent

Date

**THE NORTHWEST NAZARENE UNIVERSITY HUMAN RESEARCH REVIEW
COMMITTEE HAS REVIEWED THIS PROJECT FOR THE PROTECTION OF HUMAN
PARTICIPANTS IN RESEARCH.**

Appendix G

Debrief Statement

Thank you for your participation in this study.

Once the data has been analyzed, I will email you the summary for your school as well as a copy of my final dissertation for your use as you feel appropriate. This study will conclude March 31, 2017.

Meanwhile, if you have any questions please do not hesitate to contact me via email at kbrinkerhoff@nnu.edu, or via phone at 541-821-8852.

Thank you for your participation!

Kristina L. Brinkerhoff
Doctoral Student
Northwest Nazarene University
HRRC Application # 8042016

Appendix H

Member Checking E-mail

Dear Participants;

Thank you for your contribution to my research. As I mentioned, once the data has been analyzed, I will email you the summary for your school as well as a copy of my final dissertation for your use as you feel appropriate. This study will conclude March 31, 2017.

Please do not hesitate to reach out if you have questions regarding the study, or anything else that we discussed during my visit to your school. Meanwhile, if you have any questions please do not hesitate to contact me via email at kbrinkerhoff@nnu.edu, or via phone at 541-821-8852.

Thank you for your participation!

Kristina L. Brinkerhoff
Doctoral Student
Northwest Nazarene University
HRRC Application # 8042016