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Thriving in a Broken System: An Ecological Investigation of Academic Achievement and Resilience in Foster Youth

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Thriving in a Broken System: An Ecological Investigation of Academic Achievement and Resilience in Foster Youth

by

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Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

May 2017

Dedication

My mission in life is not merely to survive, but to thrive; and to do so with some passion, some compassion, some humor, and some style.

— Maya Angelou

This dissertation is dedicated to my mother, Addie, whose love and support has carried me through the arduous journey of my graduate education. My mother represents for me the icon of Black womanhood. Through her tireless example of integrity, confidence, and compassion, she has nourished my soul and person over the years. Every hurdle seemed less insurmountable when she would remind me that "I only need just the one spot" on the team, in the program, in the company, etc., and that I could graciously leave those other seats for my competition. In my mother's eyes, there was always a place for me in the world's elite circles. Now, her 30-year plan for me (did you think I'd forgotten?) has come to fruition, and I am able to dedicate my gifts, so lovingly bestowed upon me, to the uplift of others. I am able to help others find their place in the world, find their one spot.

Acknowledgements

I am immeasurably grateful to my mentors and co-chairs, Dr. Keisha Bentley-Edwards and Dr. Delida Sanchez. They have been in my corner every step of the way, taught me how to persevere, and picked up my pieces when I needed them. They have shown me how research conducted with intention and passion leads to greater effort and greater results. Their skills throughout the research process, from idea inception to manuscript submission (and acceptance!), have prepared me to be an excellent scholar. As women of color, Drs. Bentley-Edwards and Sanchez have shown me lives fulfilled both professionally and personally. I go forth into my career better for having known them and having been guided by their hands. They will always lift as they climb.

To my committee members, Dr. Tim Keith, Dr. Liz Gershoff, and Dr. Diane Schallert, I am indebted. Your expertise in your fields has strengthened my contribution to mine. Dr. Keith instilled in me a wonder for the statistical complexities of SEM and a calm in the face of uncooperative models. Dr. Gershoff gave me valuable insight into the contexts of development and showed me the beauty of a career enriched by the bridge of research and policy. Dr. Schallert cultivated in me a sense of passion and joy in all my endeavors by engaging me as an active learner and introducing me to the rich world of learning and educational psychology.

To both the participants and the data collection specialists for the dataset from which my results are drawn, I am immensely grateful. The youth involved in this study have experienced a variety of hardships, and they willingly shared these hardships and triumphs with researchers who were eager to understand their experiences. I am able to build my study and indeed my career because they have shared their lives with the field.

Thriving in a Broken System: An Ecological Investigation of Academic Achievement and Resilience in Foster Youth

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The University of Texas at Austin, 2017

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Foster youth experience many adverse educational outcomes as a result of their frequently changing home and school environments. A well rounded model that identifies areas of resilience for foster youth may bolster the academic strengths of these adolescents and help them achieve academic success. With these needs in mind, this dissertation employed an ecological approach to fill the gaps in current knowledge of factors that influence academic achievement for foster youth. This secondary data analysis study utilized structural equation modeling (SEM) to create a holistic view of academic resilience that was based on Spencer's 1995 Phenomenological Variant of Ecological Systems Theory (PVEST), using data from the National Survey of Child and Adolescent Well Being (NSCAW). The study determined what factors predicted academic achievement in foster youth, how development influenced achievement, and which factors most strongly predicted growth in achievement. Results indicated that relationships with caregivers and other supportive adults and activities that cultivate resilience among foster youth were important predictors of math and reading

achievement. Age also played a role as early adolescents (ages 11-13) and mid adolescents (ages 14-17) differed in how well constructs within the presented models were measured for each group. Additionally, age and maladaptive coping predicted variability in the initial levels and growth in reading and math achievement. Implications for supporting academic resilience by reducing school mobility and developing partnerships with key community members were discussed.

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CHAPTER 1: INTRODUCTION

Among adolescents in the United States, foster youth are an often overlooked population with unique educational needs (Levy et al., 2014). These students are part of a system that strives to help them meet their health and well-being necessities but often cannot offer them needed academic support as such services fall beyond the scope of the agencies. The child welfare system in nearly every state expends the majority of its scarce resources on ensuring that these adolescents have safe shelter, good nutrition, and mental health support. It is therefore understandable but no less concerning that little attention, if any, is given to the educational needs of these students, who are often struggling academically. Efforts have been made for states to better address the educational needs of children in foster care. Child welfare agencies must make it their goal to connect youth with beneficial services for their educational needs. More academic support is necessary to ensure that foster youth are able to obtain the educational skills they need to have a bright future.

CURRENT STUDY

With these needs in mind, this dissertation employed an ecological approach to fill the gaps in current knowledge of factors that influence academic achievement for foster youth. This secondary data analysis study used structural equation modeling (SEM) to create a holistic view of academic resilience that was based on Spencer's 1995 Phenomenological Variant of Ecological Systems Theory (PVEST), using data from the National Survey of Child and Adolescent Well Being (Dolan, Smith, Casanueva, &

Ringeisen, 2011). The study determined what factors predicted academic achievement in foster youth, how development influenced achievement, and which factors most strongly predicted growth in achievement.

Table 1. *Children in Foster Care in 2014 in the United States*

Total Number of Children	415,129		Mean(Mdn) Age in Yrs		8.7(8.0)
Sex	Percent	Number	**Age**	Percent	Number
Male	52%	216,645	< 1 Year	7%	28,607
Female	48%	198,426	1 Year	8%	33,264
			2 Years	7%	29,726
Most Recent Placement Setting	Percent	Number	3 Years	6%	26,512
Pre-Adoptive Home	4%	15,554	4 Years	6%	23,719
Foster Family Home (Relative)	29%	120,334	5 Years	5%	22,714
Foster Family Home (Non-Relative)	46%	190,454	6 Years	5%	22,070
Group Home	6%	23,233	7 Years	5%	20,456
Institution	8%	32,955	8 Years	5%	18,770
Supervised Independent Living	1%	4,474	9 Years	4%	17,216
Runaway	1%	4,544	10 Years	4%	15,500
Trial Home Visit	5%	21,989	11 Years	4%	14,974
			12 Years	4%	14,983
Case Plan Goal	Percent	Number	13 Years	4%	16,651
Reunify with Parent(s) or Principal Caretaker(s)	55%	218,889	14 Years	5%	19,138
Live with Other Relative(s)	3%	12,351	15 Years	5%	22,622
Adoption	25%	99,521	16 Years	6%	26,119
Long Term Foster Care	4%	15,008	17 Years	6%	26,476
Emancipation	5%	18,934	18 Years	5%	9,561
Guardianship	4%	14,739	19 Years	1%	3,245
Case Plan Goal Not Yet			20 Years	1%	2,386
Established	5%	18,408			

CHILD WELFARE BY THE NUMBERS

According to data released by the US Department of Health and Human Services from their Adoption and Foster Care Analysis and Reporting System (AFCARS, 2013, in Administration on Children, Youth and Families), over 415,000 children were in foster

care across the nation in 2014, with a growth in population as more children enter care than exit. Table 1 provides agency statistics across the country.

Thirty-two percent of these children were secondary school-age, between the ages of 12 and 18. The average time children spent in foster care was 20.8 months, but nearly 30% of youth spent two years or more in care. Foster youth skew slightly more male at 52%. The majority of children and youth in foster care (46%) are currently living with a foster family to whom they are not related. For over half of foster youth (55%), the major goal of their tenure in foster care is reunification with their parents. The variety of placements, age ranges, and case plans suggest that foster youth are a group with complex stories. The diversity of their stories means their needs are often just as complex.

<div align="center">STATEMENT OF THE PROBLEM</div>

Educational Outcomes for Foster Youth Are Poor

Children in the foster care system currently experience many adverse educational outcomes. In Texas, a state with one of largest populations of foster youth by virtue of being highly populated, the 2012 school year saw nearly a quarter of the foster youth population in special education as compared to only 9% of the state population (Burstain & Taylor, 2013). These children were most likely to be in special education for emotional disturbance issues rather than a learning disability. Additionally, foster youth were more often suspended from school for behavioral disruptions than the general child population. Foster youth are also more likely to drop out and less likely to graduate for myriad

reasons (Burstain & Taylor, 2013). States across the nation report similar patterns for the students in their child welfare system. Clearly these children need better academic, social, and emotional support.

   Trajectories to Poor Educational Outcomes. Adolescents in the child welfare system represent a population with a distinct set of educational challenges. These educational hurdles stem from the series of difficulties that foster youth face as they encounter maltreatment, placement instability, and school instability. As shown in Figure 2, the following section details the trajectory for many students from maltreatment, to removal, to shuffling across home placements, to experiencing multiple school changes. As a result of these uprooting changes, foster youth experience many negative educational outcomes.

Figure 1. Trajectory for foster youth displaying path from maltreatment to negative educational outcomes.
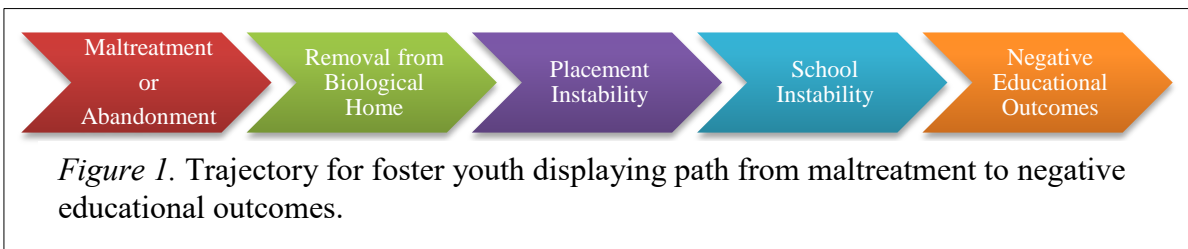
   The cascade begins with the pejorative effects of sustained maltreatment at the hands of their caregivers (Slade & Wissow, 2005). This maltreatment sometimes leads to removal from their family home and placement with relatives or foster care providers. The disruption of family life for transition into a foster care environment can continue to negatively affect the student if placements change frequently. A side effect of these changes, whether frequent or not, is school placement instability which occurs when students must change schools to accommodate their new living situations (Zetlin,

Weinberg, & Shea, 2006). These issues interact to produce concomitant effects that ultimately put the student who is involved with the child welfare system at risk for poor educational outcomes.

   Maltreatment or abandonment. Young people most frequently enter the foster care system due to maltreatment at the hands of their caregivers. Nationwide, neglect is the most common form of child maltreatment with 78.3% of substantiated maltreatment cases being identified as neglect in 2012 (Children's Bureau, 2013). The frequency of neglect stems from the difficulty in effectively treating it due to its entanglement with issues of poverty (see Slack, Holl, McDaniel, Yoo, Bolger, 2004 for an explanation of this relationship). The effects of chronic neglect as well as other forms of abuse on children's academic performance can be seen from an early age. Even pre-kindergarten children who experience episodes of abuse or neglect that is unsubstantiated, that is, investigated but not confirmed by an agency, still experience deficits in reading, language, and science skills (Fantuzzo, Perlman, & Dobbins, 2011). Conflict with teachers was found to be an issue among 3- and 4-year olds who were removed from their parents' care (Lipscomb, Schmitt, Pratt, Acock, & Pears, 2014). Pears, Kim, Fisher, and Yoerger (2013) found that, by third grade, children in foster care were less academically engaged than their non-maltreated peers. The effects of maltreatment continue through to middle and high school, as Slade and Wissow (2005) found that adolescents in these grades still reported problems completing their homework assignments and had lower grade point averages than their peers. Clearly maltreatment puts children and adolescents at risk for negative academic outcomes.

Placement instability. Another risk factor that youth in the foster care system face is the frequency and instability of their substitute care placements. Children may be placed in various types of non-parental care, such as with a foster family, in a group home, or in a residential treatment center, and children may transition through these placements during their stay in foster care. In 2013, Children in the Texas foster care system had an average of 2.5 placements during their time in foster care (Texas Department of Family and Protective Services, 2013). Research has looked at placement disruptions in terms emotional well-being from a presence of mental disorder and pathology, but less so in terms of soliciting reports from the students themselves (Hussey & Guo, 2005). As a more direct influence on academic performance, however, a frequent by-product of having to transition between substitute care placements is transitioning to different schools.

School instability. As students relocate to their new living situations, they must often change schools. These school disruptions have some obvious implications regarding continuation of educational pacing. Anecdotally, there is often a delay between the time of entry into a new placement and enrollment in a nearby school. Most schools require enrollment and identification paperwork before a child may attend classes, and a student's records must be manually—the transfer is done digitally but must be manually initiated—transferred between schools to facilitate class placement and address other academic needs (Advocates for Children of New York, 2000; Weinberg & Luderer, 2004). If this delay in school enrollment is not during the summer months, it translates to missed instruction time. As students transfer school, the inconsistency of course offerings

and electives may leave many students behind in the credits needed for an on-time graduation (Zetlin, Weinberg, & Shea, 2006.)

Negative educational outcomes. Truancy also has been documented as a result of placement disruption. Zorc et al. (2013) found that elementary school children who had frequent placement disruptions attended an average of 3.6 schools in two years. More importantly, they found that the high degree of school instability held for children who were reunited with their parents, and that this level did not differ before and after placement, suggesting that factors that lead to a child's entry into the foster care system may also contribute to school instability. Regardless of the reason for school instability, the main detriment of foster youth's school instability is truancy. In addition to the loss of instruction time in the classroom, students may be negatively perceived by teachers as uncommitted and disengaged from their schoolwork, which may in turn cause teachers to discriminate further against these students in the form of decreased attention, encouragement and assistance. This effect has not yet been explored in the literature, so future research should aim to establish the presence of negative perceptions of foster youth.

Educational Initiatives for Foster Youth: A New Frontier

Across the country, child welfare agencies are grappling with the issue of providing equitable educational outcomes for foster youth. As federal and state agencies assess the needs of youth in their care, the call for additional data to inform programs and initiatives has begun in earnest. In 2008, the Fostering Connections to Success and Increasing Adoptions Act was signed into law. Among a host of provisions to improve

the lives of foster youth, the Fostering Connections Act added a requirement that a foster youth's case files include plans for educational stability.

States are similarly mirroring the federal example by implementing data collection policies and putting programs in place. In 2006, California convened the first meeting of its taskforce for the Foster Youth Success Initiative (FYSI) due to the alarmingly low rate of foster youth representation in higher education. The FYSI is tasked with bolstering foster youth college enrollment levels by improving early access to academic support and services, academic performance and program completion. More recently in Texas, the Department of Family and Protective Services has collaborated with the Texas Educational Agency to create a new code in the Public Education Information Management System (PEIMS) that will collect aggregate level data on all students who are in foster care beginning in the 2014-2015 school year. Previously, no such centralized data tracking was available, which meant that students' status as foster youth was not recognized by PEIMS, so their progress could not be monitored as easily.

The examples here illustrate the current agenda of child welfare agencies as they realize the need for better data to support evidence-based practices and interventions. As such, the field must work tirelessly to provide this data so that foster youth can experience better educational outcomes as appropriate programs are implemented. To this end, this dissertation contributes to the field by developing a structured model of academic achievement for foster youth that also identifies areas of resilience along their paths.

An Ecological Approach to Understanding the Problem

Focusing solely on one aspect of a foster student's life does not offer the most complete picture of the environmental, developmental, and behavioral factors that influence the academic performance of that young person. Thus, an ecological approach that views the various impacts as a cyclical and all-encompassing system of effects is necessary to pinpoint the areas where current knowledge is lacking, as well as the areas where intervention may be most effective. Margaret Beale Spencer (1995) developed the model, Phenomenological Variant of Ecological Systems Theory, or PVEST, to help explain the processes at work in an individual's life, both within and outside of the control of that individual. PVEST improves upon the basic ecological model (Bronfenbrenner, 1979) by detailing the interactions between an individual and his or her environments as well as the resulting influence these interactions have for an individual's identity formation. Individuals are seen as active participants in shaping the responses of their environments. This model is ideal for examining the myriad processes at both the environmental and individual level that may affect the educational success of foster youth.

PVEST has five stages of impact. See Figure 2 for examples that illustrate relevant factors within each stage for a foster student. The first stage, Risk Contributors, identifies both risks and protective factors within an individual's environment, including characteristics of that individual, which mitigate or worsen the level of risk for adverse outcomes that an individual faces. A foster student may be Black Latina and thus subject

to ethnic biases. Though her biological family lived in extreme poverty which negatively affected her early development due to frequent emotional abuse, her responsive and sensitive foster parents live an upper middle-class lifestyle in an affluent neighborhood with a high school that is notable for its rigorous academic program and skilled marching band.

Risk Contributors

Community Environments

Protective Factors

Relationship w/ Caregiver

Special Educational Needs of Child

Net Stress Engagement

School Engagement

Relationship w/ Teacher

Relationships w/ Peers

Life Stage Outcomes

Academic Achievement

Reactive Coping Methods

Adaptive Coping Strategies
(Youth Activities)

Maladaptive Coping Strategies
(Problem Behaviors)

Emergent Identities

Social Identity
(Social Skills)

Academic Identity
(School Performance)

Figure 2. Phenomenological Variant of Ecological Systems Theory (PVEST, Spencer, 1995). PVEST consists of five interactive stages that demonstrate the active agency of a participant in his or her environment. The stages here display relevant factors for academic achievement of foster youth.

These risk contributors influence a person's Net Stress Engagement, so named because it accounts for both positive and negative experiences that interact to determine the different sources of stressors an individual will encounter, as well as how that individual's environment will respond to him or her. The student may face discrimination at her new, predominantly White school from teachers who consider her a problem student as well other students who exclude her from their social groups. She may find a small group of close peers who help acclimate her to school and shield her from bullying. In response to these stressors, a person exhibits Reactive Coping Methods. The methods may be adaptive or maladaptive and are context-and individual-specific, meaning that what works positively for someone in one situation could also lead to deleterious outcomes in other situations. Our student may engage in activities that promote resilience such as sports, hobbies, and school clubs. Alternately, she may cope poorly and exhibit severe anxiety or lash out aggressively.

As these coping methods are repeated and habitually performed, they become Stable Coping Responses which lead to the development of Emergent Identities. The individual constructs a sense of self from his or her actions and begins to piece together a new identity. After revealing to her chemistry teacher that she is a foster youth and has suffered emotional abuse, the student disengages from class and blames her poor performance on inherent incompetence because her biological mother frequently told her that she would never be good at science. She instead focuses her energy on music composition and finds that she enjoys the combination of mathematics and creativity that composition requires.

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Ultimately, this constructed identity and its contained behaviors lead to various Life Stage Outcomes, in which the performance of identity has consequences in that person's environment. These consequences can be positive, such as high math achievement, or adverse in the case of disengagement from school and truancy. These outcomes then feed back into the original risk contributors, and the system is affected accordingly (Spencer, 1995). See Figure 2 above for a representation of the PVEST stages.

SUMMARY AND ORGANIZATION

Foster youth experience many adverse education outcomes as a result of their frequently changing home and school environments. A well rounded model that identifies areas of resilience for foster youth may bolster the academic strengths of these adolescents and help them achieve academic success. This study sought to understand what factors contributed to academic achievement, including its growth, and how development played an additional role. The next two chapters of this dissertation highlight the current literature on academic resilience for foster youth followed by the methodology used to address this study's aims. The fourth and fifth chapters give the results of the study and conclude with a discussion.

Chapter 2 focuses on a review of the literature on academic achievement and resilience in foster youth as framed by PVEST (Spencer, 1995). The literature review is organized into five broad categories corresponding to the five stages of PVEST. Within each stage, relevant factors are identified as they pertain both directly to academic achievement and indirectly as sources of influence on factors that ultimately predict

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achievement. This chapter serves to ground the subsequent methodology in current theory and provide justification for choices made. Chapter 2 concludes with a list of research aims. This study has three broad aims: 1) develop a holistic understanding of academic achievement and resilience in foster youth, 2) explore developmental differences in achievement paths, and 3) explain growth in academic achievement.

Chapter 3 details the methodology and analytic strategies employed in this study. Secondary data analysis was used to address the three research aims of this study. Data came from the National Survey of Child and Adolescent Well-Being (NSCAW), a national longitudinal dataset of youth and families who have had interactions with child welfare agencies. Structural equation modeling provided analytic power to test this study's hypotheses. First, in Aim 1, a model of academic achievement that uses PVEST as a framework was developed using confirmatory factor analysis and path analysis. Next, developmental differences in Aim 2 were examined with invariance testing and multi-group modeling. Finally, growth in academic achievement, the focus of Aim 3, was tested via latent growth modeling. Descriptions of the data set, measures, and analytic techniques are covered in this chapter as well.

Chapter 4 displays the results of study for each of the three research aims. Baseline statistics are presented first. Aim 1's results included the final latent model, both the measurement and the structural portions. A description of the latent factors and their indicators are presented as well. Aim 2 details the lack of invariance found between the age cohorts and the details of those tests. Aim 3 explains the growth curve models for math and reading achievement. An unconditional model (with no predictors) and a

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conditional model (with relevant predictors assembled from the previous aims) are shown for each achievement type.

Chapter 5 summarizes the results and discusses their practical significance for the field. Implications for foster youth and the relationships they form are discussed. Limitations to the current study are offered, and future directions for further research on academic resilience in foster youth are explored. This chapter ends with a conclusion of the project and a call to action on behalf of the academic needs of foster youth.

CHAPTER 2: LITERATURE REVIEW

In 2014, over 415,000 children were in foster care across the nation, with a growth in population as more children entered care than exited (Administration on Children Youth and Families, 2013). Foster youth across the nation currently experience many barriers to academic success. In addition to the maltreatment sustained that caused them to enter care, other issues may complicate the path to academic achievement, such as high mobility in placements and schools which often leads students to fall behind (Zorc et al., 2013). Currently, national and state child welfare agencies and departments of education are beginning to recognize the need to adjust their data collection and program policies to better understand the myriad factors that influence achievement.

To this end, a model that encompasses a more developmentally holistic picture of achievement is best equipped to describe the academic trajectories that foster youth may take. When a holistic, ecological framework is applied here, environmental, developmental, and individual factors can be considered. Margaret Beale Spencer's Phenomenological Variant of Ecological Systems Theory (PVEST, 1995) serves as an ecological framework to examine five stages of influence that foster youth experience and to which they react. This review chronicles literature that details some of the pertinent factors for foster youth at each of the five stages.

As seen in Figure 2, PVEST has five stages of impact. The first stage, Net Vulnerability Level, identifies both risks and protective factors within an individual's environment, including characteristics of that individual, which mitigate or worsen the level of risk for adverse outcomes that an individual faces. This net risk influences a

person's Net Stress Engagement, so named because it accounts for both positive and negative experiences that interact to determine the different sources of stressors an individual will encounter, as well as how that individual's environment will respond to him or her. In response to these stressors, a person exhibits Reactive Coping Methods. The methods may be adaptive or maladaptive and are context-and individual-specific, meaning that what works positively for someone in one situation could also lead to deleterious outcomes in other situations. As these coping methods are repeated and habitually performed, they become stable coping responses which lead to the development of Emergent Identities. The individual constructs a sense of self from his or her actions and begins to piece together a new identity. Ultimately, this constructed identity and its contained behaviors lead to various Life Stage Outcomes, in which the performance of identity has consequences in that person's environment. These consequences can be positive, such as high math achievement and a positive self-image, or adverse in the case of disengagement from school and truancy. These outcomes then feed back into the original risk contributors, and the system is affected accordingly (Spencer, 1995).

PVEST is an ideal framework to examine the academic achievement of foster youth because it offers ways to highlight resilience in these students. Previous research has examined phenomena in this population with the primary purpose of establishing the presence of mental disorder and pathology instead of identifying places for resilience (Hussey & Guo, 2005). Resilience refers to the ability to adapt and excel despite hardships (Luthar, Cicchetti, & Becker, 2000; Masten, Best, & Garmezy, 1990). A study

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of resilience means a study of the strengths of foster youth instead of a sole focus on their

shortcomings. Much attention has been paid to resilience during the process of

transitioning out of care (Daining & DePanfilis, 2007; Driscoll, 2013; Hines, Merdinger,

& Wyatt, 2005; Samuels & Pryce, 2008), but foster youth demonstrate resilience

throughout their tenure in the child welfare system, and the effects of that determination

can be seen in outcomes before emancipation. Understanding how resilience foster youth

thrive academically is important to assembling the changes that must be implemented in

order to support the population as a whole. This study ultimately seeks to understand

academic resilience in foster youth.

NET VULNERABILITY LEVEL: RISKS AND PROTECTIVE FACTORS

Many factors impact the academic resilience of foster youth. PVEST posits that

an individual begins with a set of both risk and protective factors that shape the level of

adversity he or she will face (Spencer, 1995). This stage, shown in Figure 2, focuses on

net vulnerability because it is the combination of both supports and barriers for a person

that informs the adversity to be overcome. These factors often arise from environmental,

developmental, and individual sources. The communities in which foster youth are

situated as they transition across placements include the neighborhoods they reside in and

the schools they attend. The contexts of these environments influence academic

achievement indirectly through perceptions and behaviors. Relationships with caregivers

also determine the support and resources to which foster youth have access. Physical,

emotional, and cognitive impairments that stem from the maltreatment foster youth have

experienced often lead to interaction with special education systems, which may serve as

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support or impediment. Finally, race and intersectionality with gender may further complicate the academic path of students as they encounter disparate treatment in the classroom. These factors all inform the risks and protections that foster youth encounter in the path to academic resilience.

Community Environments. The contexts in which foster youth develop play a large role in determining the assets they have at their disposal as well as the obstacles that may hinder their success. As foster youth move through several placements, the neighborhoods and schools they interact with are constantly in flux. Despite this instability, several features of these contexts have definitive impacts on youth in general. The effects of neighborhood violence and perceptions of safety have been shown to influence different aspects of academic achievement. Features of poorly organized neighborhoods also affect students within them. Through analysis of a national longitudinal dataset of neglected children, Chapple and Vaske (2010) found that neighborhoods with low organization–characterized by infrequent youth supervision, low regard for the general type of activity in the neighborhood, crime, and violence–have a higher prevalence of children who repeated a grade, suggesting poor academic progression for these foster youth.

Illicit neighborhood behavior also affects youth in guiding some of the activity and habits formed. Neighborhood drug activity predicted substance use rates in a sample of almost 3,000 middle school students (Abdelrahman, Rodriguez, Ryan, French, & Weinbaum, 1998). Exposure to violence and delinquency within neighborhoods contributed to increased alcohol abuse and dependence among students (Keller,

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Blakeslee, Lemon, & Courtney, 2010). Milam, Furr-Holden, and Leaf (2010) assessed perceptions of neighborhood safety and violence in a late elementary sample of urban students. They found higher math and reading achievement were associated with increased perceptions of safety and decreased perceptions of violence. The associations for safety were larger than those for violence, suggesting that while violence is detrimental to success, the perceptions of safety are separately important as well. Safety within school is also important as it has been associated with increased academic engagement (Côté-Lussier & Fitzpatrick, 2016). The environment in which youth are developing should be considered when developing a holistic view of academic resilience for foster youth.

  Caregiver Relationships. While neighborhoods may contain detrimental features such as poor organization and violence, key adults in those neighborhoods offer a source of guidance to youth, fostering their resilience. As part of Bronfenbrenner's original 1979 Ecological Systems Theory, the microsystem represents the closest relationships that an individual has, and chief among them are connections within the nuclear family. While biological family bonds are disrupted for foster youth, other caregivers fill the parental role. The relationship between foster youth and their caregivers is of special significance because foster parents serve a crucial role in helping maltreated youth transition into substitute care placements. Foster parents help youth settle into the daily living pattern of a new home and adjust to the novelty both at home and at school as well (Castellanos-Brown & Lee, 2010). Indeed, when asked to give advice to their peers currently in the

child welfare system, former youth encouraged a close relationship with one's caregiver to help with transitions (Mitchell, Kuczynski, Tubbs, & Ross, 2010).

Warm foster homes and competent foster parents are a strong source of resilience for youth when they provide genuine connections, boundaries, and mentorship. Foster youth desire caregivers who parent organically as a good biological parent does when they help with homework, inquire about daily life, and enjoy activities together with the youth in their care (Storer et al., 2014). Beyond cultivating a sense of belonging, foster parents also can offer academic support at home. Cheung, Lwin, and Jenkins (2012) found a greater relationship between home-based involvement from foster parents and academic achievement than between school-based involvement and achievement. The authors attributed this relationship to the high academic expectations that foster parents espouse and reinforce in the home environment by encouraging their foster youth to get good grades and to obtain more advanced education. Clearly caregivers are an importance source of strength and resilience for foster youth.

Special Education. The special education system was designed to provide students tailored educational support, but in reality it may not always work as intended. While many foster youth benefit from special education services that address their physical, emotional, and cognitive impairments, the population as a whole is disproportionately placed into special education. A 2014 report on educational outcomes for foster youth placed the enrollment rate between one third and two-thirds of state child welfare populations (National Working Group on Foster Youth in Education, 2014). In a review of the special education experiences of foster youth, Zetlin (2006) found issues at

both ends of the enrollment spectrum. Foster youth may be more frequently enrolled in special education services than necessary due to behavioral issues or attempts to gain entry into certain group homes that require concurrent enrollment in their special education program.

Conversely, youth may not be receiving needed special education services due to the frequent school transitions they make when they change placements (Zetlin, 2006). As mentioned, records transfers are often slow and poorly coordinated (Advocates for Children of New York, 2000; Zetlin, Weinberg, & Luderer, 2004), resulting in youth missing the array of services which they need and to which they are legally entitled. On average, 17 and 18 year old foster youth read at a seventh grade level (National Working Group on Foster Care in Education, 2014). The emotional, physical, and cognitive impairments that foster youth experience as a result of both their maltreatment and their delayed educational progress are part of the reality faced by many youth and should be included in an encompassing view of factors that affect academic achievement, but they are not the end of the story in academic resilience.

Taken together, the risks and protective factors that foster youth experience contribute to an ecological picture of resilience. Poor neighborhood structure, including crime, violence, and drug abuse negatively impact youth. Inappropriate interaction with the special education may put some foster youth in more restrictive settings than necessary while leaving others without beneficial services. While these factors are detrimental to success, resilience is built through consideration of strengths such as good relationships with foster parents who encourage and support academic success, as well as

participation in activities that promote positive youth development. These factors represent the net vulnerability of foster youth.

NET STRESS ENGAGEMENT

Beyond those factors that contribute to an individual's vulnerability or resilience, PVEST posits that the perceptions surrounding those factors are important in understanding resultant effects (Spencer, 1995). A particular risk factor may be perceived as manageable and thus have its negative influence mitigated. I argue that often the perceptions of an event or circumstance have a greater influence on outcomes than the event or circumstance itself. As detailed in Figure 2, the perceptions of both foster youth and others in their environment work together to co-construct academic outcomes that foster youth experience. Foster youth's perceptions are important in understanding how they may react to the negative associations of being in foster care. If these students believe they have appropriate supports in place and that they do not face substantial barriers to success, they are more likely to strive for their goals (Oyserman, Harrison, & Bybee, 2001). In educational settings, these perceptions are manifested in foster youth's relationships with their teachers and peers. Moreover, the relationship that foster youth have with their school, which can be represented in school engagement, plays a key role as well.

Relationships with Teachers. Foster youth often rely on key adults in their lives to help them navigate the arduous task of adolescence. Relationships are two-sided in that teacher regard for foster youth affects the warmth experienced by foster youth, and vice versa. I begin this section with a study I conducted on teacher perceptions of foster youth

and conclude with empirical literature on foster youth-teacher relationships. Youth in the child welfare system may have academic needs that go unmet as a result of the perceptions that educators hold of this population. My study explored teachers' ideas about foster youth, both as a population in general and the specific foster youth with whom they had interactions. Fifteen current and former teachers at the middle and high school level were interviewed in a semi-structured format, and data were analyzed using a grounded theory approach (Strauss & Corbin, 1998).

  I found that teachers had low general knowledge of the child welfare system, and that this knowledge was often negative and stereotyped. Additionally, for the foster youth who may be present in their schools, teachers had expectations of poor emotional and academic performance. Foster youth were equated, perhaps erroneously, to economically disadvantaged students as a whole. This population was labeled with a stigmatized identity as irreparably damaged. On a positive note, these negative perceptions were combatted with more accurate depictions of each individual student when educators took time to connect with their students on a personal level. Based on these results, a school environment must include well trained staff and informed peers who are able to provide safe spaces for foster youth to discuss their situations in order to promote better emotional processing. This more open, less marginalized treatment of foster youth status may help foster youth better cope with the turmoil in their lives and ultimately foster resilience (Flannigan & Bentley-Edwards, 2016).

  Turning to the student-teacher relationship, foster youth identify educators as key figures in supporting their commitment to academics. In interviews with former foster

youth, Hass, Allen, and Amoah (2014) collected narratives of "turnaround people." These individuals were educators who helped foster youth remain resilient against academic failure by offering social support through caring relationships, high expectations, and encouragement to make positive contributions to their school and community. A training development project for working with court-involved youth revealed the high need for educators to have trauma-informed competence and resources (Crosby, Day, Baroni, & Somers, 2015). Unfortunately, many educators, particularly new teachers, find themselves challenged in connecting with the foster youth they encounter in their classrooms because these educators lack the information, skills, and support for such interactions (Zetlin, MacLeod, & Kimm, 2012). Nonetheless, such relationships influence foster youth resilience when they can be established.

Relationships with Peers. In addition to drawing strength from their educators, foster youth, much like adolescents in general, rely on the support of their peers. School instability often leads to the disruption of social support networks within schools, which contributes to smaller social networks (Negriff, James, & Trickett, 2015). Fortunately, social media has become an invaluable tool for keeping youth connected with their peers even over physical distances (Hedin, Höjer, & Brunnberg, 2011). Even if contact with multiple friends cannot be maintained, identifying a single important friend offers foster youth an outlet for discussion of their personal problems as well as moral motivation and positive peer pressure (Hass & Graydon, 2009). Establishing friends in a school can also reduce the amount of bullying foster youth may sustain (Vacca & Kramer-Vida, 2012). Peer social support continues to be instrumental to overcoming obstacles even after youth

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leave care. A study of Latino foster youth found the aged-out youth still depended on peer networks formed while in care to avoid homelessness (Perez & Romo, 2011). Peers provide a variety of support functions for foster youth, whether they are entering new schools, making adjustments, or transitioning out of care.

School Engagement. Another important source of perception is a student's level of engagement at school. Just as relationships with both teachers and peers inform the school climate in which foster youth exist, so too does the task of schooling itself further color foster youth's perceptions. Debate exists over the ideal definition for school engagement. Jimerson, Campos, and Greif (2003) conducted a systematic review of 45 studies and concluded that school engagement, while being narrowly defined in differing ways due to measurement differences, typically involves affective, behavioral, and cognitive dimensions and a variety of contexts. Regardless of the definition, school engagement is a much valued academic trait, and those students who demonstrate greater levels of resilience also tend to have greater school engagement (Bethell, Newacheck, Hawes, & Halfon, 2014). The following sections give a brief review of the scant school engagement literature on foster youth followed by a more general exploration of school engagement.

School engagement research specific to foster youth is scarce. Côté-Lussier and Fitzpatrick (2016) found that foster students with poor academic engagement were more likely to struggle with physical aggression, which indicates poor social skills. Results from a national longitudinal study of foster youth suggest that school engagement directly predicts school achievement among other factors (Leonard, Stiles, & Gudiño, 2016).

Additionally, foster youth who remained engaged in school are more likely, much like other youth, to attend college (Schulting, Malone, & Dodge, 2005). Clearly, more engagement research that focuses on foster youth is needed.

School engagement in the general student population is well studied. This important construct is implicated in many areas of the academic literature. Academic engagement may have a bidirectional relationship with achievement, with both constructs predicting each other over time (Chase, Hilliard, John Geldhof, Warren, & Lerner, 2014; Motti-Stefanidi & Masten, 2013). Engagement also serves as mediator between several constructs and achievement, such as peer relationships (Liem & Martin, 2011), parenting styles (Blondal & Adalbjarnardottir, 2014), community violence exposure (Borofsky, Kellerman, Baucom, Oliver, & Margolin, 2013), and mental health behaviors (Hoglund, 2007). Conversely, disengagement may serve as a mechanism for students to buffer themselves from the negative emotional effects of previous poor performance (Motti-Stefanidi, Masten, & Asendorpf, 2015). School engagement itself varies with context. Studies have found that engagement decreases with age (Van de gaer, Pustjens, Van Damme, & De Munter, 2009; Wang & Eccles, 2012), suggesting the need to investigate such effects with early and mid-adolescent age cohorts.

As foster youth better understand the supports and barriers that exist in their path to academic success, they can make plans to utilize their supports in overcoming their barriers. These perceptions are often manifested in their relationships with their peers, teachers, and school. Peers and teachers may serve as both support and obstacles. Resilient youth are able to identify those individuals who can offer them support and

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reduce interactions with problematic others (Schroeter et al., 2015). These relationships

gain further importance as youth navigate their school. Armed with this understanding of

their academic environment and the people within it, foster youth can take action.

REACTIVE COPING METHODS

The fourth stage of PVEST, shown in Figure 2, concerns the reactions foster

youth may have to stressors in their environment. These reactions reveal the coping

strategies that youth employ in managing their stressors. Several theories exist to describe

the manifestations of coping mechanisms in response to stress. Lazarus and Folkman

(1984) proposed the transactional stress model in which coping is a two-stage cognitive

process with resultant behaviors. In the first stage, the individual makes a primary

appraisal, which is the assessment of the event as positive or negative. If the event is

negative—positive events elicit no stress—the individual then assesses his or her ability

to cope with the situation through a secondary appraisal. Coping ability is determined

through the consideration of personal resources and external supports. If resources are

low, the event is more likely to be seen as a threat. The presence of high support may turn

the event into a challenge, which poses an opportunity for growth and further resilience

(Lazarus & Folkman, 1984).

The transactional stress theory also posits two distinct coping foci: problem-

focused coping and emotion-focused coping. When individuals employ problem-focused

coping, they are attempting to mitigate the stressor by eliminating its source. A student

who has experienced poor academic performance and is engaged in problem-focused

coping may decide to increase their studying efforts or take better notes in class.

Conversely, a student who engages in emotion-focused coping attenuates stress by reducing the resultant emotional effect of the stressor (Lazarus & Folkman, 1984). A student who is performing poorly may choose to disengage from school and regard school as unimportant in order to lower the felt stress of poor performance. Emotion-focused strategies tend to be more maladaptive because they do not directly address the source of stress that an individual is experiencing. This section details behaviors that constitute both adaptive and maladaptive coping mechanisms as foster youth may employ them.

Adaptive Coping Mechanisms. There are a variety of activities that engage youth in the development of resilience. Such activities encourage positive youth development, which promotes resilience through the development of an adolescent's strengths (Lerner, Phelps, Forman, & Bowers, 2009). Hass and Graydon (2009) conducted a study of resilient foster youth who had graduated from college or reached at least their junior year. They found a hallmark feature of the majority of these students to be engagement in community service activities, sports, and personal hobbies. Sports involvement in particular has been noted for its development of social skills, including team membership finesse and leadership skills (Barnes & Larcus, 2015; Manz, Pearce, Mott, Henson, & Sims Jr, 2013) as well as enhancing the ability to make decisions under pressure, a skill that may contribute to better test-taking skills (Cotterill & Discombe, 2016). These enhanced decision making abilities may also contribute to problem-focused coping. Activities also offer an environment in which to cultivate better peer connections

(Hedin et al., 2011). When foster youth are encouraged to participate in activities that promote their natural strengths, resilience is promoted as well.

Maladaptive Coping Mechanisms. While foster youth have many ways to exhibit resilience, the overwhelming stressors they face also lead to less positive coping strategies. The trauma of entering care—from both the maltreatment and the adjustment to being removed from family—and the resultant placement and school inability may leave youth with mental health and behavioral problems (Fratto, 2016). Trauma can lead to both internalizing and externalizing behaviors as a way to cope with stressors in an emotion-focused way. Internalizing behaviors are those focused inward on the self and include anxiety, depression, and withdrawal. Externalizing behaviors, such as aggression and attention deficits, have an outward target and are more readily identifiable.

The negative effects of these behaviors on academic achievement are well documented. Anxiety and depression have been linked to lower grade point averages, both as a predictor and outcome (Weidman, Augustine, Murayama, & Elliot, 2015). Anxiety has been implicated in a reduction of healthy sleeping patterns which result in lower achievement as well (Schmidt & Van der Linden, 2015). Haller and colleagues (2015) found that social anxiety leads to an impairment of necessary social skills for youth. In line with transaction stress theory, a large study of Spanish adolescents found maladaptive mental schemas about academic performance and self-perceptions to be determinants of depressive symptoms (Mateos-Pérez, Calvete, & Hankin, 2015). Social withdrawal from school often is related to academic disengagement (Elmore & Huebner,

2010). These inward behaviors, while sometimes difficult to identify in adolescents, nonetheless affect achievement.

Externalizing behaviors also contribute to poor academic performance and achievement. In academic settings, aggressive students are likely to be punished through suspension and expulsion. In 2014, foster youth aged 17 and 18 were twice as likely as their non-foster peers to be suspended from school and three times more likely to be expelled (National Working Group on Foster Care in Education, 2014). Youth with attentional problems are more likely to exhibit poor social skills (Mikami, Huang-Pollock, Pfiffner, McBurnett, & Hangai, 2007). While trauma does lead to real emotional and behavioral problems that schools may be ill equipped to handle (Zeitlin, Weinberg, & Shea, 2010), considering the findings in my qualitative study of teachers' perceptions of foster youth that behavioral problems are anticipated (Flannigan & Bentley-Edwards, 2016), some of the increase in discipline rates may be overreactions or inequitable treatment of the transgressions of foster youth. Regardless, externalizing behaviors often contribute to missed instruction and lower achievement.

As foster youth navigate their academic environments, they make decisions on how to handle the stressors they encounter. After assessing events for their relative threat or challenge, foster youth may employ a variety of coping strategies. These strategies may be adaptive and promote resilience. They may also be maladaptive and lead to increased mental health problems. While behaviors exhibited by resilient foster youth are the main interest of this study, negative cognitions and behaviors are a reality for many foster youth and must be accounted for in holistic models. In all likelihood, resilient

foster youth may still exhibit some negative behaviors, but they have found ways to overcome these barriers to academic success. Mentoring programs are one such method that has been shown to reduce both internalizing and externalizing behaviors through the development of prosocial skills (Jent & Niec, 2009).

EMERGENT IDENTITIES

As foster youth repeatedly employ their chosen coping strategies, enduring patterns of behavior emerge. As shown in Figure 2, these patterns solidify into identities, that is, characteristics with which foster youth may identify. Two important areas of identity in this model are social and academic selves. Students develop a social identity through a set of social skills. Additionally, academic performance sculpts the academic identity of students.

Social Identity through Skills. As youth successfully navigate social spaces, including school, they gain a diverse set of skills that facilitates this process. Stephens (1992) identified four broad categories of behaviors and cognitions that comprise social skills. Self-related behaviors focus on positive regard for the self and expression of that positive regard. Task-related behaviors, like following directions and turning in completed assignments, are performed in order to successfully complete some individual or group mission. Environmental behaviors focus on interactions with the environment, like group dynamics. Interpersonal behaviors focus on interactions with others, including conflict resolution and conversational skills (Stephens, 1992).

Social skills are involved in the enhancement of academic achievement in a variety of ways. A study designed to improve social skills and lower anxiety through

mindfulness meditation resulted in improved academic achievement for students with learning disorders (Beauchemin, Hutchins, & Patterson, 2008), which is a population that may include many foster youth. Social skills also are important to the developmental trajectory of other life skills. Campbell (2006) chronicled behavior problems in early childhood and found that social impairments in childhood lead to poor acquisition of age-appropriate learning skills, which turns into poor academic performance and achievement in adolescence. Ansari and Gershoff (2015) found that social skills in early childhood that are relevant for learning may actually be a prerequisite for academic skills. Conversely, as adolescents develop socially, their social skills cultivate extraverted personality traits, which translate into leadership skills as adults (Guerin et al., 2011). One promising aspect of existing research is the intervention and training nature of many current studies. As previously mentioned, social skills training can ameliorate maladaptive coping strategies that create internalizing and externalizing behaviors (Jent & Niec, 2009). The success of these and other projects (Durlak, Weissberg, & Pachan, 2010; Elksnin & Elksnin, 2009) suggests that social skills are a malleable trait that can be improved, offering one source of enhancing resilience in students who are currently struggling academically.

Academic Identity through Performance. In addition to the social self, students are attuned to their level of academic performance. Academic performance includes elements like grade progression, truancy, subject area performance, and involvement in disciplinary practices. While some markers like grade progression and subject area performance have obvious direct relationships with achievement, other factors like truancy and disciplinary practices have a greater range of causes and effects. A statewide

academic profile of foster youth in the 2009/2010 school year in California found that

foster youth are more likely than their peers to be held back, particularly at 9th grade

where nearly 10% of foster youth had been retained at least once (Barrat & Berliner,

2013). Additionally, foster youth are less likely than their peers to be enrolled in advance

subject areas (Burley & Halpern, 2001). Disparate disciplinary practices have been

previously discussed, so this section focuses on the effects of truancy for foster youth.

Truancy has been linked to many poor academic outcomes. In 2014, foster youth

were twice as likely as their peers to be absent from school (National Working Group on

Foster Care in Education, 2014). School transitions and court appearances are some of

the many causes of these absences. As children miss instruction and fall behind, they may

become less engaged in school. Foster youth are already at risk for greater academic

disengagement (Fantuzzo, Perlman, & Dobbins, 2011; Lipscomb, Schmitt, Pratt, Acock,

& Pears, 2014; Pears, Kim, Fisher, and Yoerger, 2013; Slade & Wissow, 2005). Chang

and Romero of the National Center for Children in Poverty chronicled the effects of

truancy at early ages, noting that children who frequently miss school in kindergarten

have the lowest academic performance among their peers by first grade, even when

accounting for differences due to ethnicity, gender, and socioeconomic status (Chang &

Romero, 2011). This increasing disengagement from school may lead adolescents to drop

out entirely (Balfanz, Herzog, & Mac Iver, 2007). Students who drop out are less likely

to be employed, more likely to be have poor mental and physical health, and more likely

to be incarcerated (Ikomi, 2010). Truancy experienced as a result of frequent substitute

care placement disruption poses a unique risk for foster youth. Chronic truancy may undermine a student's resilience.

As foster youth interact with their school systems, their academic identity is solidified through the development of a social self and particular performance characteristics. Truancy and disparate disciplinary practices contribute to poor academic performance. Additionally, social skills affect the interactions that foster youth have with others in their school settings and the perceptions of they hold of themselves.

LIFESTAGE OUTCOMES: ACADEMIC ACHIEVEMENT

As Figure 2 shows, the fifth PVEST stage describes the end product of an individual's environmental, developmental, and behavioral sequences. For foster youth in academic settings, the main life stage outcome is academic achievement, typically measured with standardized test scores. National statistics on foster youth achievement are difficult to obtain, which highlights the usefulness of analyzing existing national longitudinal datasets to better understand how youth across the country perform as a whole. In the absence of national data, several states have assembled statistics on the youth in their care. This section details some current state trends in academic achievement for foster youth.

The Washington State Institute for Public Policy released a report in 2001 on the educational outcomes of their foster youth. Foster care status predicted a 7 to 8 percentile point decrease in standardized test scores. In an analysis of 11th grade foster youth who continued to 12th grade, these students were 57% less likely than their peers to graduate

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from high school. The report attributes these differences to school mobility and grade retention (Burley & Halpern, 2001).

A 2004 Chapin Hall study of Illinois foster youth revealed that maltreated youth who were not removed from their homes tended to be a year behind their non-maltreated peers, while maltreated youth placed in foster care were more than a year behind non-maltreated students. This study also accounted for an often overlooked element of academic achievement for foster youth: these students are typically found in poor performance schools with lower school-wide achievement scores, which likely exacerbates achievement deficits. After comparing foster youth with only peers within the same school, the achievement gap narrowed but remained (Smithgall et al., 2004).

In 2013, WestEd published a study reviewing the achievement gap for foster youth in California. One important general finding was that foster youth were less likely to even take state-administered standardized exams, likely due to school mobility that has these students absent from school during the important testing dates. Foster youth were not proficient in reading or math, lowering their achievement scores. They also underperformed compared to students who were from low socioeconomic backgrounds, dispelling the notion that foster youth face the same perils and outcomes as economically disadvantaged youth. Fewer than half of foster youth passed their high school exit exams, compared to 76% of their peers statewide and 66% of their economically disadvantaged peers (Barrat & Berliner, 2013).

Beyond secondary school achievement, it is important also to consider college level outcomes. Pecora's 2012 review of educational outcomes for foster youth put

college completion rates between 3% and 11%. Promisingly, though, many foster youth do aspire to attend college, with some estimates at 70% for youth who desire this educational path (McMillen, Auslander, Elze, White, & Thompson, 2002). Unfortunately, foster youth reported being dissatisfied with college counseling advice (Burley & Halpern, 2001). The admirable goals of these youth make it imperative to understand how their former peers overcame the adversity faced in the child welfare system to experience academic success.

This literature review has chronicled the five stages of PVEST (Spencer, 1995) as they pertain to determinants of academic achievement and resilience in foster youth. In the first stage, Net Vulnerability Level, community environments, caregiver relationships, special education, and race and intersectionality serve as a network of risk and protective factors. Community factors like violence and drug use may lower youth's academic performance (Abdelrahman, Rodriguez, Ryan, French, & Weinbaum, 1998; Chapple and Vaske, 2010), while perceptions of neighborhood and school safety buffer these negative effects (Côté-Lussier & Fitzpatrick, 2016). Caregivers offer a strong source of resilience as they help the youth in their care navigate transitions and encourage their academic growth (Mitchell, Kuczynski, Tubbs, & Ross, 2010; Chueng, Lwin, and Jenkins, 2012). Many foster youth interact with the special education system, which may be both a support and risk depending on the quality of services provided (Zetlin, 2006). Together, these factors inform the net vulnerability level of foster youth.

A foster youth's set of risk and protective factors influence their Net Stress Engagement, which comprises the interactions and perceptions that youth have within

relevant environments (Spencer, 1995). Relationships with teachers and peers are key here. Flannigan and Bentley-Edwards (2016) showed that good student-teacher relationships dispel many of the negative, stereotyped notions that educators may have of foster youth. Peers offer support through listening and serving as a positive motivator (Hass & Graydon, 2009) while also reducing bullying victimization of foster youth (Vacca & Kramer-Vida, 2012). Additionally, school engagement is important because it is related bidirectionally with achievement as the two constructs predict each other over time (Chase, Hilliard, John Geldhof, Warren, & Lerner, 2014; Motti-Stefanidi & Masten, 2013). These relationships with peers, teachers, and the school environment offer sources of resilience when stressors are overcome.

Foster youth employ Reactive Coping Methods as they response to the stressors in their environment. Both adaptive and maladaptive methods can be employed (Spencer, 1995). Adaptive methods include community service, sports, and hobbies, which promote positive youth development (Lerner, Phelps, Forman, & Bowers, 2009) through enhancing a youth's strengths and thus their resilience. Maladaptive methods negatively affect achievement, whether they are internalizing behaviors like anxiety and depression (Weidman, Augustine, Murayama, & Elliot, 2015) or externalizing behaviors like aggression that lead to suspension and expulsion at higher rates for foster youth (National Working Group on Foster Care in Education, 2014). These coping mechanisms eventually settle into stable patterns.

Foster youth form Emergent Identities as their pattern of chosen coping strategies becomes part of how they perform (Spencer, 1995). In academic environments, the social

self and academic performance are two important spheres of identity. Social skills are important to the development of subsequent academic skills and thus academic achievement (Campbell, 2006) as well as later life skills like leadership qualities (Guerin et al., 2011). Furthermore, aspects of academic performance such as grade progression and subject area performance are directly related to achievement, while issues such chronic absence from school and disciplinary practices affect engagement and thus achievement indirectly. (Chang & Romero, 2011).

The performance of an enacted identity eventually leads to Lifestage Outcomes (Spencer, 1995), chief among them academic achievement. While national statistics are lacking, several states have chronicled the poor outcomes for youth in their care. These students have lower standardized achievement scores (Smithgall et al., 2004); Barrat & Berliner, 2013), are less likely graduate high school (Burley & Halpern, 2001), and complete college at very low rates (Pecora, 2012). These outcomes continue despite many foster youth having college aspirations (McMillen et al., 2002), which heightens the need to understand academic resilience in this population. Many factors previously discussed are implicated in these outcomes, including school mobility, chronic truancy, environmental characteristics, and disciplinary concerns, which lends support to the theory of a holistic ecological model. Some of these factors, such as truancy and school quality, fall beyond the scope of this study or are not factors that can be studied at present given the use of secondary data in this study. The following section details those factors that are presented in this study.

Research Aim 1. The first aim of this study was to develop a holistic understanding of academic resilience in foster youth.

> **RQ 1.1** Do special education involvement, quality of caregiver relationship, community environment, and protective factors compose net vulnerability for foster youth?

> **RQ 1.2** Do youth's relationships with their teachers and peers and their school engagement compose net stress engagement for foster youth?

> **RQ 1.3** Do adaptive and maladaptive strategies compose reactive coping methods for foster youth?

> **RQ 1.4** Do social and academic identities compose emergent identities for foster youth?

> **RQ 1.5** Which factors predict academic achievement for foster youth?

RQ1.1 Hypothesis. Net Vulnerability is a latent variable composed of special education involvement, quality of caregiver relationship, community environment, and protective factors.

RQ 1.1 Rationale. Foster youth may be involved in special education more frequently than necessary or may be underenrolled due to difficulties with the transfer of records needed for enrollment (Zetlin, 2006). Caregivers in the form of foster parents help youth build resilience by aiding in their transition among school and living arrangements and encouraging their academic growth (Castellanos-Brown & Lee, 2010). Youth who reside in community environments—neighborhoods and schools—that are perceived to be safe

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and well organized experience increased academic engagement and higher achievement (Milam, Furr-Holden, & Leaf, 2010; Côté-Lussier & Fitzpatrick, 2016), Various protective factors such as having a reliable adult figure (Castellanos-Brown & Lee, 2010) all contribute to the net vulnerability that foster youth experience because they directly and indirectly influence academic achievement.

RQ1.2 Hypothesis. Net Stress Engagement is a latent variable composed of a youth's relationships with their teachers and peers, as well as their overall relationship with their school, which is represented by school engagement.

RQ1.2 Rationale. When students feel supported, they aim to accomplish their goals (Oyserman, Harrison, & Bybee, 2001). Students and peers within the school, as well as school policies, contribute to a student's perceptions of support. When educators have more personal relationships with foster youth, they develop more realistic, less stereotyped notions of these students (Flannigan & Bentley-Edwards, 2016). Close peer relationships provide an emotional support outlet (Hass & Graydon, 2009) and protection from bullying (Vacca & Kramer-Vida, 2012).

RQ1.3 Hypothesis. Reactive Coping Methods is a latent variable composed of adaptive strategies and maladaptive strategies.

RQ1.3 Rationale. As students appraise their situations, they react to stressors through the activation of different coping methods (Spencer, 1995; Lazarus & Folkman, 1984). Students who employ adaptive strategies build skills such as decision-making (Cotterill & Discombe, 2016) , fostering their resilience which facilitates educational attainment (Hass & Graydon, 2009). Maladaptive strategies are associated with decreased

achievement (Weidman et al., 2015) and poor academic identity (Mateos-Pérez, Calvete, & Hankin, 2015). School engagement directly predicts achievement (Leonard, Stiles, & Gudiño, 2016).

RQ1.4 Hypothesis. Emergent Identities is a latent variable composed of social identity and academic identity.

RQ1.4 Rationale. As youth continue to perform their coping strategies, social and academic identities emerge. A better social identity can facilitate learning, which improves academic achievement (Campbell, 2006). Conversely, poor academic identity in the form of poor performance hinders achievement in obvious ways, but can also indirectly hinder achievement when foster youth are retained in previous grades (Barrat & Berliner, 2013) or experience sustained truancy and missed instruction (National Working Group on Foster Care in Education, 2014).

RQ1.5 Hypothesis. Net Vulnerability, measured at Wave 1 will predict Net Stress Engagement at Wave 1, Reactive Coping Methods at Wave 2, and Emergent Identities at Wave 2. Net Stress Engagement at Wave 1 will predict Reactive Coping Methods and Emergent Identities at Wave 2. Net Stress Engagement, Reactive Coping Methods, Emergent Identities will predict Academic Achievement at Wave 3.

RQ1.5 Rationale. Margaret Beale Spencer's (1995) PVEST model posits five stages of impact on life outcomes of an individual (See Figure 2). This theoretical framework guides the overall structure of the model. For each of the five stages, current literature has identified some key factors that contribute to the influence of that stage. The stages in turn predict each subsequent stage as well as having direct relationships with academic

achievement, with the exception of net vulnerability, which largely acts through its

relationships with other factors and has an indirect mediating effect on achievement.

Figure 3 depicts the full model for these relationships.
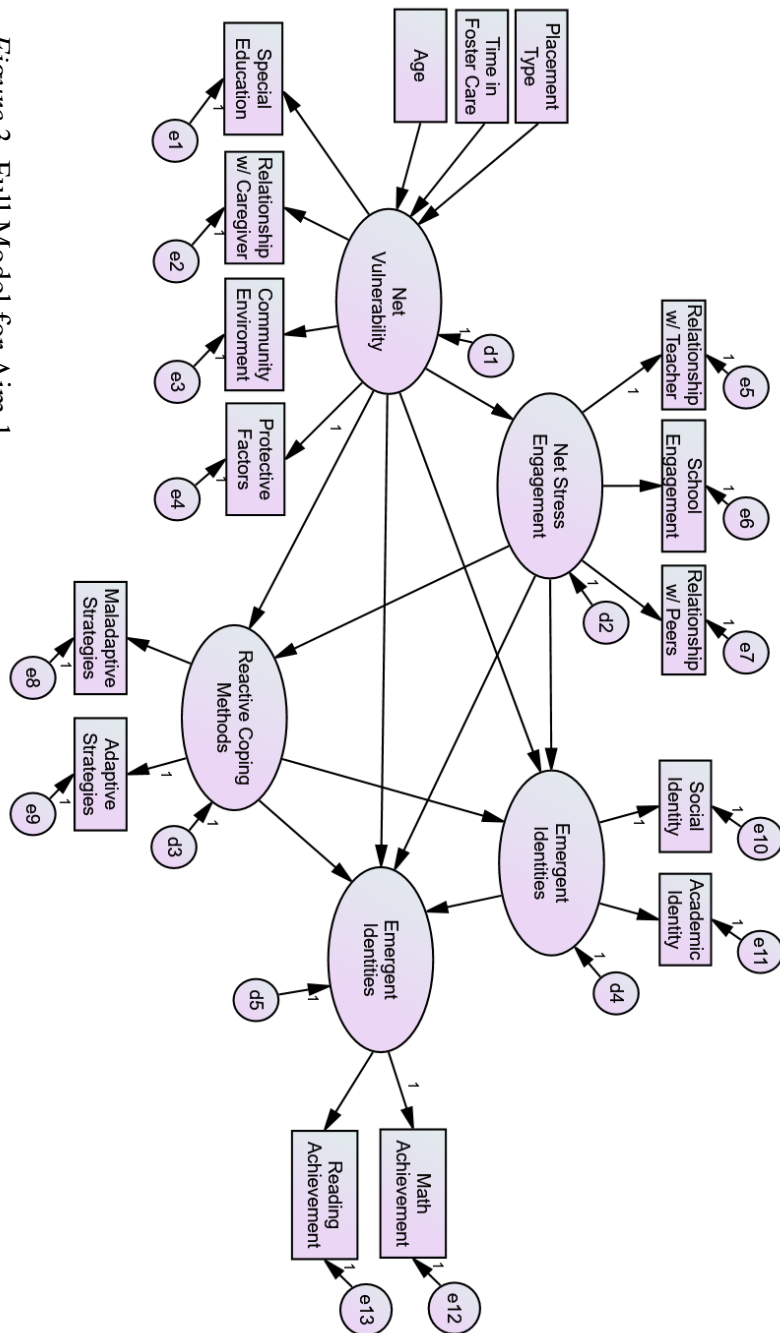
Figure 3. Full Model for Aim 1

Research Aim 2. The second aim of the study was to explore developmental differences in paths to academic achievement.

> **RQ2.1** Within each stage of the model (each latent variable), do age differences exist?

> **RQ2.2** Do the relationships in the full model differ between developmental cohorts?

RQ 2.1 Hypothesis. Relationships that involve school engagement will be smaller for the older cohort.

RQ 2.2 Hypothesis. Relationship strengths across the full model will be smaller for the older cohort.

Aim 2 Rationale. Studies have found that some constructs, such as engagement, decrease with age (Van de gaer et al., 2009; Wang & Eccles, 2012), suggesting the need to investigate such effects with early and late adolescent age cohorts. The relative effects of different factors may change as youth progress through adolescence, revealing some factors to be more important to academic achievement than others depending on age. A better understanding of age effects can contribute to more effective, developmentally appropriate targeting of constructs in support of academic resilience.

Research Aim 3. Given the general and developmental characteristics of achievement paths as established by the other aims, the final goal of the study was to understand which factors in each stage best predicted growth in academic achievement.

RQ3 What factors influence growth in academic achievement for foster youth?

Aim 3 Hypothesis. Factors that directly predict achievement will explain growth.

Aim 3 Rationale. The overall goal of this study is to describe academic resilience in foster youth. To this end, it is important to understand what factors contribute to a growth in academic achievement. The previous aims will establish which factors, both time variant such as the factors underlying the latent stages of PVEST as well as time invariant factors such as gender and age. As each of these analyses is conducted, the results will determine which factors are included in this growth model. For example, if age differences are found with respect to the overall path model, age will be included in the conditional growth model. Figure 4 represents a sample growth model in which four conditional factors are tested.
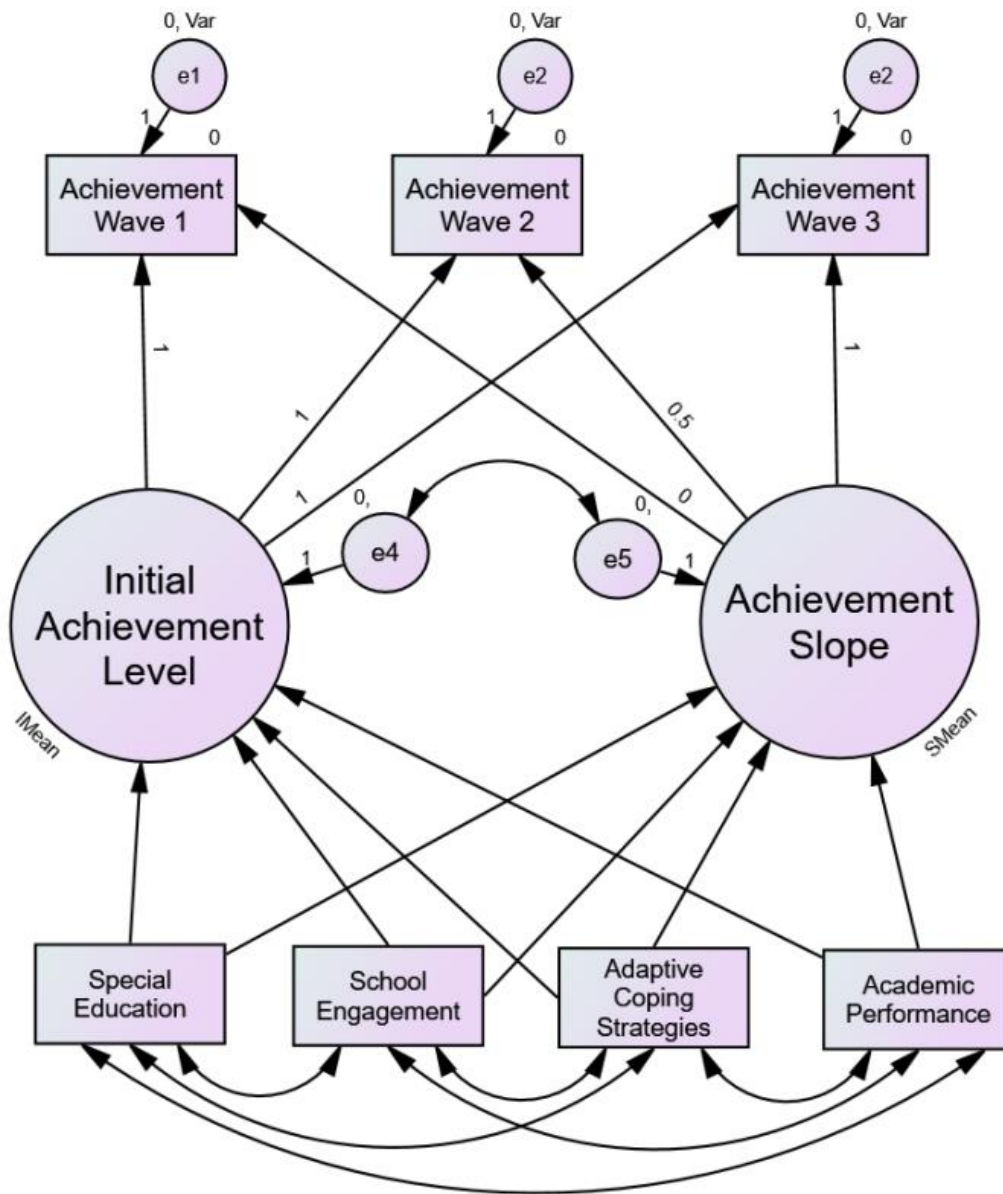
Figure 4. Example Latent Growth Model for Aim 3

CHAPTER 3: METHODS & ANALYTIC STRATEGY

DATASET

National Survey of Child and Adolescent Well-Being (NSCAW). The National

Survey of Child and Adolescent Well-Being was conducted to address three broad

research topics: 1) the demographic particulars of children and families who interact with

child welfare services, 2) the trajectories of these children and families as they make their

way through the system, and 3) the outcomes, both proximal and distal, of these

interactions. To this end, researchers employed stratified random cluster sampling to

measure the well-being, permanency outcomes, environmental safety, and services

received by child welfare system participants. The NSCAW dataset comprises a national

sample, making it the only such dataset in existence that includes nation-level

information, such as home environment characteristics, from children and families across

the country (Dolan, Smith, Casanueva, & Ringeisen, 2011).

Two study phases were conducted, termed NSCAW I, which ran between 1999

and 2007, and NSCAW II, which is the most recent dataset that includes improved

measures and an extended sampling timeframe. This study utilized NSCAW II.

Beginning in May 2009, three waves of data were collected 18 months apart. The third

wave, completed in December 2012, was released in 2014, which offers the benefit of

relatively recent information on the current state of child welfare system participants. The

dataset is unique in that it includes data from multiple informants: the child, their

caseworker, caregiver, and a teacher. For children younger than 11 years old, their

caregiver answers questions of the child's behalf in addition to completing the separate

caregiver modules. Child welfare cases were included in the sample regardless of substantiation status—whether a finding of maltreatment was confirmed—which allows researchers a broader view of all types of interactions with child welfare, including sub-threshold cases.

NSCAW II Participants. The NSCAW dataset includes 5,873 participants aged birth to 17.5 years whose child welfare cases were closed between February 2008 and April 2009. Eighty-three counties in 30 states are represented in the dataset. The dataset is evenly divided by gender with 51.4% male participants. Half (51.0%) of the children in the study are White, one-third are Black or African American (34.6%), and the remaining children are Asian/Hawaiian/Pacific Islander (3.4%), American Indian/Alaskan Native (8.3%) with 2.8% race unknown. In addition to the racial demographics, researchers recorded the overarching ethnic category of Hispanic origin. The sample is 27.5% Hispanic, which means that 27.5% of participants, in addition to identifying as one of the above racial identities, also identified themselves as Hispanic. The majority of participants (61.9%) still resided with their original caregivers. The remaining 38.1% (n=2,237) of participants resided in formal kinship care arrangements (8.4%; 495), informal kinship care (9.2%; 540), foster care in a non-relative single family household (1,105; 18.8), a group home or residential treatment center (1.6%; 68) or some other out of home living arrangement (0.49%; 29).

The Present Sample. This study included NSCAW II cases from children and youth age 11 and older who did not reside with their original caregivers at baseline. These participants were chosen to better understand influences on achievement at this

age, as well as because age 11 is the youngest age for which the participants themselves were interviewed to answer their own questions, as opposed to caregivers answering of their behalf. The residential status reflected participants who are foster youth; that is, those participants who had been removed from their original living arrangement and placed into a form of substitute care. The NSCAW researchers intentionally oversampled for infants in data collection, so while children age 11 and older only account for 17.9% of the total sample, the large overall sample size means this small percentage still equates to 1,054 children and youth. Of this age sample, 343 youth did not reside with their original caregivers at baseline. The study will be based on this sample, which was reduced after appropriate cleaning of data.

Two cohorts were created for analysis purposes. The cohorts were based on participant age at baseline during Wave 1. The early adolescent cohort (early cohort) was composed of participants aged 11 to 13 to capture effects relevant to middle school and earlier. Participants aged 14 to 17 composed the mid adolescent cohort (mid cohort) as they reflected high school aged youth. These cohorts were used for all age-based comparisons. Due to expectations of grade retention, age may not always match expected grade of students. Age, however, reflects adolescent development, and delays in development will likely be reflected elsewhere in variables such as grade retention and special education needs. For this reason, age was still used to split the cohorts.

MEASURES

This section details the measures included and the waves (1, 2, or 3) from which they were collected. Each latent variable was composed of several measured variables.

Reliability information is provided where available. Appendix A contains a list of items

within in each measure.

Wave 1: Philadelphia Family Management Study, Parent Interview Schedule

(Furstenberg, 1990). Reported by the caregiver and measured at wave 1, community

environment factors were assessed via a measure that was adapted from Furstenberg's

1990 Philadelphia Family Management Study. Seven items assessed levels of gang

activity, neighborhood drug activity, perceived safety, and general investment and

engagement of community members.

Wave 1: Special Educational Needs of the Child (NSCAW). Completed by the

child's teacher at wave 1, these 13 items were created by NSCAW researchers to assess

conditions that may hinder a child's educational progress, such as physical, mental, or

emotional issues. Questions regarding current enrollment in special education services

and individual educational plans (IEPs) were also posed.

Wave 1: Relationship with Caregiver (Wellborn & Connell, 1987). Completed

by the child at wave 1, this instrument was adapted from Connell's 1980's work for the

Rochester Assessment Package for Schools. Twelve items assessed levels of

interpersonal support that students received from their caregiver. Participants were asked

to rate the truthfulness of the items on a 4-point Likert scale ranging from Not At All

True to Very True.

Wave 1: Resilience Factors (Runyan et al., 1997). Completed by the child at

wave 1, this instrument measured protective factors from the Longitudinal Studies of

Child Abuse and Neglect (LONGSCAN) data archives. The 19 dichotomous (Yes/No)

items included questions about access to reliable adults, religious affiliation, social activities, and leadership roles.

Wave 1: Loneliness and Social Dissatisfaction Questionnaire for Young Children (Asher & Wheeler, 1985). This measure of poor relationships with peers was completed by the child at wave 1. The 16 item scale ($\alpha = .90$) measured a student's ability to initiate and maintain friendships as well as markers of school adjustment. Items were scored on a 5-point Likert scale ranging from Never to Always. Only participants who were enrolled in school (i.e. not home schooled) completed this measure, but that included all participants in the current sample.

Wave 1: Your Relationship with the Student (NSCAW). These project-developed questions were completed by the teacher to assess his or her relationship with the target child at wave 1. Information on subject area taught, class size, length of acquaintance with child, and familiarity with child was gathered in four items.

Wave 1: Drug Free Schools (DFSCA) Outcome Study Questions (US Department of Education, 1989). School engagement, completed by the child at wave 1, was assessed by nine items from the DFSCA study. Questions measured how the student felt about school and the learning process. Only participants who were enrolled in school (i.e. not home schooled) completed this measure, but that included all participants in the current sample.

Wave 2: Youth Self Report – Social Competence Scale, Activities (Achenbach, 1991). Taken at wave 2, adaptive coping strategies were assessed through 20 items ($\alpha = .89$) that measured involvement in activities that help develop social skills

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and cognition. Activities included hobbies, sports, chores, and jobs. Participants were given the opportunity to list out three activities within each category if they indicated that they engage in that activity (e.g., three hobbies or three jobs). Time spent on the activity and skill levels relative to peers were measured on a 3-point Likert scale of Below Average, Average, and Above Average.

Wave 2: Children's Depression Inventory (CDI; Kovacs, 1992). This maladaptive coping strategies measure from wave 2, completed by the youth, assessed depressive symptoms over the past two weeks. The CDI has 28 items rated on a 3-point Likert scale and yields a total score, standardized and used for this study, as well as two scale scales (Emotional Problems and Functional Problems) and four subscales: Negative Mood, Negative Self-Esteem, Ineffectiveness, and Interpersonal Problems. The CDI was standardized and combined with The Modified Self Report of Delinquency (discussed immediately below) to measure maladaptive coping. The CDI is a protected instrument; actual items are not available to report in Appendix A.

Wave 2: The Self Report of Delinquency (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983). This 47-item inventory measured delinquent and criminal acts committed in the past year at wave 2(α = .65-83) with a dichotomous Yes/No response set. Behaviors measured here included aggression and sex offenses (assault, possession of a weapon, prostitution, etc.), theft, generalized delinquency (arson, running away from home, truancy, theft, vandalism, etc.), and substance involvement (underage possession and/or distribution of both legal and illegal substances). A total score was created with each dichotomously coded Yes response contributing to the overall score. The result was

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standardized and combined with the CDI (discussed immediately above) to create a maladaptive coping measure.

Wave 2: Social Skills Rating System – Social Skills Scale, Teacher Report, Secondary School Version (SSRS; Gresham & Elliott, 1990). The SSRS (α = .90), completed by the teacher at wave 2, measured several domains of positive social skills in school settings: assertion, cooperation, empathy, responsibility, and self-control. Teachers indicated how often the target student performed the given social behavior within the past 2 months. The 30 items used a 3-point Likert scale that consists of Never, Sometimes, and Very Often.

Wave 2: Youth Self Report – Social Competence Scale, Academic Performance (YSR, Achenbach, 1991). Academic performance was assessed through this extension of the YSR (α = .89), which asked youth to rate their own performance at wave 2 in four subject areas: English/language arts, history/social studies, arithmetic/math, and science. Subject area performance was rated on a 4-point Likert scale with a range of Failing, Below Average, Average, or Above Average.

Wave 3; Waves 1 - 3: Woodcock-Johnson III Tests of Achievement (W-J III; Woodcock, McGrew, & Mather, 2001). Academic achievement was assessed via a standardized test of achievement administered by a licensed professional examiner at wave 3. Two subtests were used for youth age 11 and older: Letter-Word Identification and Applied Problems. Letter-Word Identification (α = .94) is a reading skill test that assesses reading decoding through having students read letters and words from a provided list. Applied Problems (α = .93) assesses math reasoning, math achievement,

and math knowledge through word problems. For Aims 1 and 2, Standardized Scores of the subtests from wave 3 were used. For Aim 3, W Scores from each subtest at all three waves were used; the W score is an equal interval ability score and the most appropriate W-J III metric to model growth. The W-J III is a protected instrument; actual items are not available to report in Appendix A.

APPROVAL BY HUMAN SUBJECTS COMMITTEE

This study followed the guidelines for human subject research set forth by the Institutional Review Board at the University of Texas at Austin. NSCAW is a restricted use dataset, and access must be approved prior to use. Assurances of data security were followed, including secure access of data for analysis purposes in a controlled, isolated facility and secured storage of data when not in use. Original informed consent from adult participants—caregivers, teachers, and caseworkers—and assent from youth participants, who were all under age 18 when the study began, were obtained by the NSCAW data collection team prior to interviewing. A criterion of sample inclusion was open access to child and family participants without a requirement to contact the state agency. Therefore, no agency consent was obtained, but caseworkers and agency directors, when interviewed, gave consent before the process began.

ANALYTIC STRATEGY

Baseline Data. Descriptive statistics were gathered for all participants. In addition to age, gender, race/ethnicity, living situation, and length of time in foster care, measures of central tendency for all included instruments were gathered. As age was a grouping variable of interest, t-tests of all measures were performed to assess cohort-based

differences. A t-statistic that was significant at the .05 alpha level indicated significant cohort differences.

Structural Equation Modeling. This study utilized Structural Equation Modeling (SEM) to create and analyze models that examined academic resilience in foster youth. The general purpose of SEM is to use models to determine the effects of a system of influences on various outcomes of interest, given the validity of the model (Keith, 2015). Due to the non-experimental nature of this study, the models were organized based on theory drawn from previous research and time precedence of variables. To accomplish the research aims of this study, confirmatory factor analysis, path analysis, invariance testing, multi-group modeling, and latent growth modeling were conducted. The details of each procedure are outlined in the relevant research aim.

Assumptions of SEM. As with any statistical method, SEM requires that data conform to a set of conditions in order for the analysis results to be valid. First, outcome variables must have linear relations with independent variables. Scatterplots of the variables were examined to check this assumption. Second, observations must be independently drawn from each other within the population. This assumption was met during the data collection process through random sampling techniques. Third, the data must be normally distributed. Scatterplots of the variables were used to assess this assumption along with measures of skewness and kurtosis. Lastly, the errors of the variables must be normally distributed and exhibit homoscedasticity. While SEM is fairly robust against this violation and proper sampling techniques largely eliminate the risk here, p-p plots and residual variances of the variables were examined. A p-p plot charts

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the cumulative frequency of variable residuals against their expected values, and normality results in adherence to a straight line. Homoscedasticity is met if the ratio of the highest variance to the lowest variance is less than 10 (Keith, 2015).

Missing Data. One weakness of the NSCAW dataset is the level of missing data, particularly for measures taken by teachers. Fortunately, SEM handles missing data well (Keith, 2015). Full Information Maximum Likelihood (FIML) estimation is the common method for dealing with missing data in SEM (Arbuckle, 1996) and was used here. FIML is ideal because it uses all of the data present, as opposed to listwise and pairwise deletion methods that remove cases.

RESEARCH AIMS AND STRATEGIES

Research Aim 1. The first aim of this study was to develop a holistic understanding of academic resilience in foster youth.

RQ 1.1 Do special education involvement, quality of caregiver relationship, community environment, and protective factors compose net vulnerability for foster youth?

RQ 1.2 Do youth's relationships with their teachers and peers and their school engagement compose net stress engagement for foster youth?

RQ 1.3 Do adaptive and maladaptive strategies compose reactive coping methods for foster youth?

RQ 1.4 Do social and academic identities compose emergent identities for foster youth?

RQ 1.5 Which factors predict academic achievement for foster youth?

Analytic Strategy. Confirmatory factor analysis and path analysis were used to estimate the effects of each latent variable on achievement. When path analysis is the goal, confirmatory factor analysis serves as the first step in establishing the measurement model, and path analysis tests the structural model. Thus, RQs 1.1-1.4 represent the measurement model for RQ1.5. For each PVEST stage, latent variables were created that were composed of relevant underlying factors. Confirmatory factor analysis first was conducted to ensure good construction of the latent variables. Good structure was assessed via significance of the chi-squared test (χ^2;non-significance desired) and standard benchmarks for RMSEA (<.05), SRMR (<.08), and CFI (>.95) indexes. Adjustments to the models were made as necessary before entering the latent variables into the structural model. Modification indexes (MIs) were used to determine appropriate adjustments. MIs are useful because they provide an estimated amount of model improvement if certain changes are made to the model, usually in the form of correlating variables or creating covariances between error terms. Adjustments were made based on theoretical logic and assessing which changes provided the largest improvement, as indicated by the largest MI value. Models were rerun after each modification. Analysis with bootstrapping then was used to estimate direct and indirect effects of the full PVEST model, and fit indexes were assessed once more to ascertain support of model structure. Foster care placement characteristics and age were entered as common causes. Tables 2 through 6 detail the measures to be included in each latent variable.

Table 2. *Measures for Net Vulnerability Latent Variable – Wave 1*

Construct	Instrument
Community Environment	Philadelphia Family Management Study, Parent Interview Schedule (Furstenberg, 1990).
Protective Factors	Resilience Factors (Runyan et al., 1997).
Relationship with Caregiver	Relationship with Caregiver (Wellborn & Connell, 1987).
Special Educational Needs of the Child	NSCAW developed

Table 3. *Measures for Net Stress Engagement Latent Variable – Wave 1*

Construct	Instrument
School Engagement	Drug Free Schools (DFSCA) Outcome Study Questions (US Department of Education, 1989).
Teacher Relationship with Student	NSCAW developed
Relationship with Peers	Loneliness and Social Dissatisfaction Questionnaire for Young Children (Asher & Wheeler, 1985).

Table 4. *Measures for Reactive Coping Methods Latent Variable – Wave 2*

Construct	Instrument
Adaptive Coping Strategies	Youth Self Report – Social Competence Scale, Activities (YSR, Achenbach, 1991).
Maladaptive Coping Strategies	The Self Report of Delinquency (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983). *combined with* Children's Depression Inventory (CDI; Kovacs, 1992).

Table 5. *Measures for Emergent Identities Latent Variable – Wave 2*

Construct	*Instrument*
Social Skills	Social Skills Rating System – Social Skills Scale, Teacher Report, Secondary School Version (SSRS; Gresham & Elliott, 1990).
Academic Performance	Youth Self Report – Social Competence Scale, Academic Performance (Achenbach, 1991).

Table 6. *Measures for Academic Achievement Latent Variable – Waves 1-3*

Construct	*Instrument*
Reading Achievement	Letter-Word Identification, Woodcock-Johnson III Tests of Achievement (W-J III; Woodcock, McGrew, & Mather, 2001)**.**
Math Achievement	Applied Problems, Woodcock-Johnson III Tests of Achievement (W-J III; Woodcock, McGrew, & Mather, 2001).

Note. Standard Scores from Wave 3, W Scores from Waves 1, 2, and 3.

Research Aim 2. The second aim of the study was to explore developmental differences in paths to academic achievement.

RQ2.1 Within each stage of the model (each latent variable), do age differences exist?

RQ2.2 Do the relationships in the full model differ between developmental cohorts?

Analytic Strategy. To test the developmental differences at each stage, invariance testing, a part of confirmatory factor analysis, was used. Invariance testing has several sequential steps that can compare factor structures for different groups. First, invariant models were set up to determine if the same constructs were being measured in both

groups. Next, measurement invariance was established, which sequentially tested

configural, metric, intercept, and residual invariance. Each new invariance model was

compared to the fit of the previous model, and the new model was accepted if a

significant change in χ^2 did not occur or if the change in CFI between the models was less

than .01. Configural invariance tested the similarity of the factors across cohorts. Metric

invariance tested the assumption that the latent construct is being measured on the same

scale for both cohorts. This allowed paths in the full model to be compared across

cohorts. Intercept invariance tested the assumption that the latent construct scales had the

same zero point across cohorts. Intercept invariance allowed for comparison of latent

means in the full model across cohorts. Residual invariance tested variance and

covariance of residuals across groups in order to make valid comparisons about the

variances and covariances for variables and to test hypotheses of interest.

       After measurement invariance was established, structural invariance was used to

test this aim's hypothesis that the means for each latent variable differed between age

cohorts. First, the variances were constrained to be equal across group to test the

similarity of the variances across cohorts. Next, covariances were constrained to be equal

to test the relative relationships of the latent variables across cohorts. Finally, the means

for the factors were constrained to be equal in order to test the hypothesis that latent

means differed across developmental cohorts. The hypothesis was supported if this final

constrained model had worse fit than the previous model, which was indicated by a

significant χ^2 increase and a change in CFI that is greater than .01.

Developmental differences in the full model were measured through multi-group

modeling. Specifically, Multigroup Means and Covariate Structures (MG-MACS) were

used. For this procedure age was used as a grouping variable to set up two separate

models. Next, the means for the variables of interest were constrained to zero for the

early cohort and freely estimated in the mid cohort. The direct path between each latent

variable and academic achievement was tested. The hypothesis was supported if the value

of the estimated achievement mean for the mid cohort differed significantly at the $p = .05$

level from zero, which was the value of the constrained mean for the early cohort. The

sign (positive or negative) of the mid cohort achievement means indicated the direction

of the difference (higher achievement or lower achievement, respectively), and the value

itself indicated the magnitude of difference. Additionally, moderation was tested by

examining the values of the path between the variable of interest and academic

achievement for each group and comparing models in which these paths are constrained

to be equal. A constrained model that had worse fit, indicated by a significant change in

χ^2 and violations of the standard benchmarks for RMSEA (<.05), SRMR (<.08), and CFI

(>.95) indexes, supported the hypothesis that cohort membership moderated the

relationship between that stage and academic achievement.

Research Aim 3. Given the general and developmental characteristics of achievement

paths as established by the other aims, the final goal of the study was to understand which

factors in each stage best predicted growth in academic achievement.

RQ3 What factors influence growth in academic achievement for foster youth?

Analytic Strategy. The longitudinal nature of the NSCAW dataset allows growth and change of variables to be assessed. Latent growth modeling (LGM) is a useful procedure for measuring change and the variables that influence it. It allows for analysis of variability in both the initial level of a construct as well as the variability in that construct's growth. LGM has a set of requirements and common steps. At least three time points are required. The NSCAW II dataset has three waves of data collection that were used. Scores for the dependent variable of interest must be continuous and use the same metric over each time point. For academic achievement, the Woodcock-Johnson III has W scores, which are an alternative to the standardized scores usually referenced because they function as equal interval raw scores. W scores measure change in the various subtest scores. They are derived as a Rasch transformation of the raw scores utilizing item response theory principles. Their equal interval characteristic makes them ideal for growth modeling.

LGM has two central steps. The unconditional model with initial achievement and achievement slope was analyzed to examine variability in growth across the waves. Initial achievement and achievement slope were considered significant at an alpha level of .05. Significance here indicated that a linear growth model could explain change in achievement scores. Also, significant variation in the initial levels of achievement as well as change in achievement scores existed. Next, the conditional model included variables that may explain the growth in achievement. For the conditional model in this study, the results of the previous aims' analyses were used to determine which explanatory variables would be entered. The strongest predictors--that is, the variable with the strongest direct

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path to academic achievement--from each stage in the Aim 1 analyses were entered in the conditional model. Additionally, if age was determined to have significant differences in achievement, age was also entered as an explanatory variable. Hypotheses were supported by significance in the conditional model, which indicated that the explanatory variable affected the initial levels of achievement, the growth in achievement, or both.

CHAPTER 4: RESULTS

This study sought to determine what factors predict academic achievement in foster youth, how development may influence achievement, and which factors most strongly predict growth in achievement. Foster youth have many unique life experiences that influence their academic achievement, including environmental and developmental circumstances. Using Spencer's PVEST theory that posits stages of contextual and behavioral influences on life outcomes, structural equation models that represented the various factors at play in academic success for foster youth were developed. The following sections detail the samples used in this study and the results of the three research aims.

DESCRIPTIVE STATISTICS

Overall Sample. Participants were selected based on two criteria: a) age 11 and older and b) residence in some form of out of home care at baseline (i.e., not with their original caregiver). These two criteria were used to sample foster youth who could complete measures themselves (versus their caregiver answering on their behalf). This resulted in a sample of 343 participants. Data cleaning to remove outliers that created excessive skewness and kurtosis yielded a final sample size of 275. Table 7 contains descriptive statistics for the sample. Participants ranged from 11 to 17 years old with a mean age of 14.09 years ($SD = 1.86$) and were fairly evenly divided by sex (51.6% female). Thirty-five percent of the sample self-identified as Black with 28.8% and 24.2% identifying as White and Hispanic, respectively. The remaining participants indicated

another unspecified ethnic or racial identity. Participants averaged fewer than three total

substitute care placements and spent an average of 670.71 days in out-of-home (OOH)

care. Nearly 45% of participants resided in a single-family foster home.

Table 7. *Sample Descriptive Statistics. N=275*						
	Mean		SD		Range	
Age	14.09		1.86		11-17 years	
Total Placements	2.64		2.20		1-11 placements	
Total Days in Care	670.71		423.90		1-1547 days	
	n	%			n	%
Gender			*Type of Out of Home Care*			
Female	147	51.6	Foster Care		128	44.9
Male	138	48.4	Kinship Care		98	34.4
			Specialized Care		3	1.1
			Group Home/RTC		49	17.2
Ethnicity/Race			Other Care		7	2.5
Black	100	35.1				
White	82	28.8	*Adolescent Cohort*			
Hispanic	69	24.2	Early (11-13)		107	38.9
Other	34	11.9	Mid (14-17)		168	61.1

Final Measures. After consideration for amount of data present and utility to the

included models, Table 8 displays the final variables included in the study. Appendix A

details each measure. As age is a variable of interest in later study aims, t-tests were

conducted to assess mean differences between the adolescent cohorts. Only reading

achievement differed between the cohorts [$t(192)=2.69$, $p < .01$]. The mid-adolescent

cohort (ages 14-17) had lower reading achievement at baseline than the early-adolescent

group (ages 11-13).

Table 8. *Variables Included in Study.*			
	Mean(SD)	Skewness	Kurtosis
Caregiver Relationship (W1)	13.47(2.24)	-0.92	0.49
Community Environment (W1)	12.38(3.33)	1.53	2.73
Protective Factors (W1)	4.55(0.80)	-1.90	2.93
School Engagement (W1)	34.08(5.05)	-0.76	0.90
Peer Relationships (W1)	27.85(10.30)	1.16	1.40
Maladaptive Coping (W2)	-0.16(1.41)	1.68	3.35
Adaptive Coping (W2)	0.0031(4.05)	0.041	-0.25
Social Identity (W2)	95.15(16.18)	0.21	0.090
Academic Identity (W2)	12.21(2.08)	-0.73	1.64
Reading Achievement (W3)	92.31(14.00)	-0.31	1.40
Math Achievement (W3)	87.91(10.83)	-0.23	0.90

Note. W1, W2, and W3 indicate measure was taken at Wave 1, Wave 2, or Wave 3, respectively.

HYPOTHESIS TESTING

Research Aim 1. The first aim of this study was to develop a holistic

understanding of academic resilience in foster youth.

RQ 1.1 Do special education involvement, quality of caregiver relationship,

community environment, and protective factors compose net vulnerability for

foster youth?

RQ 1.2 Do youth's relationships with their teachers and peers and their school

engagement compose net stress engagement for foster youth?

RQ 1.3 Do adaptive and maladaptive strategies compose reactive coping methods

for foster youth?

RQ 1.4 Do social and academic identities compose emergent identities for foster

youth?

It was initially hypothesized that a latent factor structure would emerge with Net

Vulnerability, Net Stress Engagement, Reactive Coping Methods, Emergent Identities,

and Achievement being the five underlying factors that explained foster youth academic experiences. However, confirmatory factor analysis ultimately revealed a four-factor solution (see Table 9 for included indicators) with good fit [$\chi^2(28) = 33.74$, $p = .209$; RMSEA = .03; CFI = .98, SRMR = .044], providing partial support for this hypothesis. Figure 5 below shows the standardized loadings for this solution.

Table 9. *Final Factor and Indicator Structure.*

Factor	Indicator
Net Vulnerability	Protective Factors (W1)
	Caregiver Relationship (W1)
Net Stress Engagement	Peer Relationships (W1)
	School Engagement (W1)
Resilience[*]	Adaptive Coping (W2) [a]
	Maladaptive Coping (W2) [a]
	Social Identity (W2) [b]
	Academic Identity (W2) [b]
Academic Achievement	Math Achievement (W3)
	Reading Achievement (W3)

Note: W1, W2, and W3 indicate measure was taken at Wave 1, Wave 2, or Wave 3, respectively. [*]Resilience is a factor that represents a combination of Reactive Coping Methods and Emergent Identities. [a] Original indicators of Reactive Coping Methods. [b] Original indicators of Emergent Identities
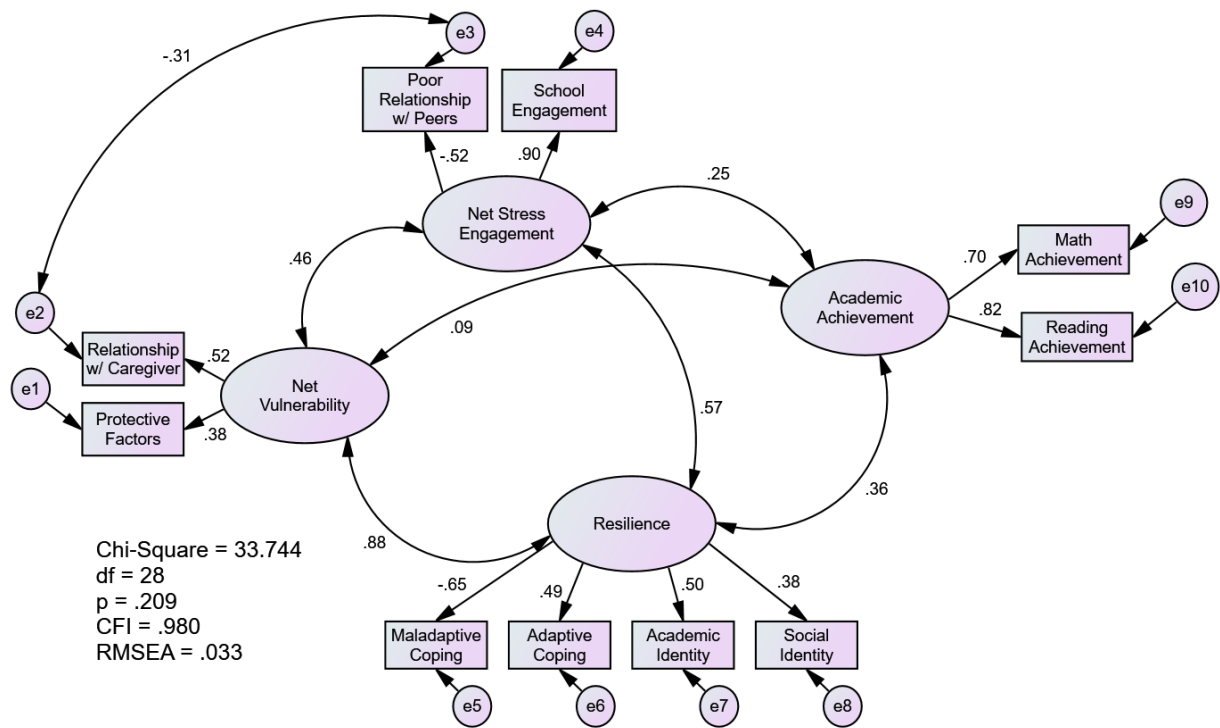
Figure 5. Four Factor Measurement Model

The first factor, Net Vulnerability, was hypothesized to have Poor Community

Environment, Protective Factors, Special Educational Needs, and Relationship with

Caregiver as indicators. Special educational needs had too much missingness (97%) to be

included, as was the case with many teacher-reported variables in the NSCAW dataset,

and was dropped from the model. Poor community environment was not a significant

indicator and also was dropped. Both relationship with caregiver (.52) and protective

factors (.38) significantly loaded to net vulnerability.

The second factor, Net Stress Engagement, was composed of Relationship with

Teacher, Relationship with Peers, and School Engagement. Similar to special educational

needs, relationship with teacher was dropped from the model due to excessive missing

data. School engagement (.90) and poor relationship with peers (-.52; higher scores denote a worse relationship) both indicated net stress engagement. The hypothesis was supported. Additionally, examination of suggested modification indices supported a correlated error term (-.31) between caregiver relationship and relationship with peers, which was theoretically defensible given the interpersonal nature of the two measures.

The third and fourth factors, Reactive Coping Methods and Emergent Identities, respectively, were proposed as two separate latent constructs composed of Adaptive Coping/Maladaptive Coping and Social Identity/Academic Identity, respectively. These four indicators, however, were highly correlated, which suggested the presence of a single underlying factor. This third factor was considered latent Resilience. All four indicators loaded significantly onto this Resilience factor (Adaptive Coping .49; Maladaptive Coping -.65; Social Identity .38; Academic Identity .50). Hypothesis was partially supported through the inclusion of all indicators but misspecification of latent variable structure. Beyond these hypotheses, Achievement was composed of Math Achievement and Reading Achievement, which significantly loaded onto the proposed latent variable (.70, .82, respectively).

RQ 1.5 Which factors predict academic achievement for foster youth?

After latent factor structure was established, correlations among latent variables were replaced with substantive paths, and common cause variables (measured at Wave 1 to establish a baseline) of Age, Days in Foster Care (transformed to reduce variance), Type of Foster Placement (dichotomously coded as single family placement or other arrangement), and Number of Placements were entered. It was hypothesized that the flow

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of prediction would be as follows: net vulnerability to net stress engagement to resilience to achievement. Figure 6 shows standardized path coefficients for significant path parameters shaded purple in the model, which had excellent fit [$\chi^2(53) = 54.37$, $p = .42$; RMSEA = .012; CFI = .99, SRMR = .042]. Age negatively predicted Achievement with older foster youth having lower levels of academic achievement. The number of days foster youth had spent in substitute care negatively predicted their Net Vulnerability but positively predicted their Resilience. Youth who had spent more time in foster care at wave 1 had worse their relationships with their caregivers and other adults in their environments. Conversely, longer foster care tenure translated to greater participation in activities for resilience. Net Vulnerability positively predicted Net Stress Engagement and Resilience, which indicated that students who had better relationships with the adults in their lives tended to have more positive engagement within their academic environment and greater activities for resilience.
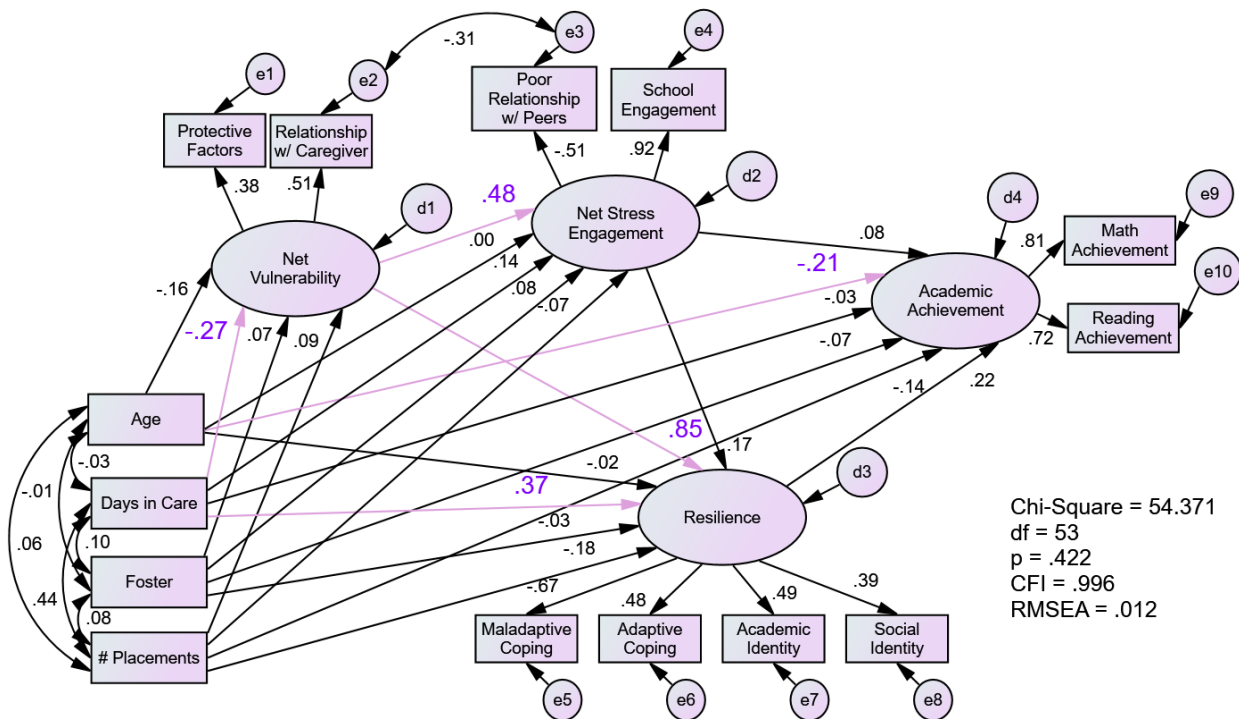
Figure 6. Four Factor Path Model

Further findings from bootstrap analysis of this model (Table 10) showed that Net

Vulnerability had significant positive indirect effects on Achievement. Foster youth who

had more support from the adults in their lives were more engaged in school and

developed better coping skills, performed better academically, and demonstrated greater

social skills. Resilience likely mediated the relationship between Net Vulnerability and

Achievement. Students who were had better relationships with caregivers and other

adults exhibited high levels of resilience, and such resilience was marginally related to

achievement.

Table 10. *Standardized Effects on Academic Achievement.*

	Direct	Indirect	Total
Type of Foster Placement	-.07	.02	-.05
Number of Placements	-.14	-.03	-.17
Days in Care	-.03	.03	.00
Age at Wave 1	-.21*	-.04	-.25*
Net Vulnerability	—	.25†	.25†
Net Stress Engagement	.08	.03	.12
Resilience	.22	—	.22

Note. Estimates obtained via Monte Carlo bootstrapping with bias-corrected CIs
* $p < .01$; † $p <. 05$

Research Aim 2. The second aim of the study was to explore developmental differences in paths to academic achievement.

RQ2.1 Within each stage of the model (each latent variable), do age differences exist?

RQ2.2 Do the relationships in the full model differ between developmental cohorts?

Invariance testing of the latent four-factor model was performed for this aim. The sample was divided into two cohorts to establish a multi-group model: the early adolescent cohort, ages 11-13 ($n = 107$) and the mid adolescent cohort, ages 14-17 ($n = 168$). These two groups simulate the distinction between students in middle school and high school. It was hypothesized that any relationships involving school engagement would be smaller in the mid adolescent cohort due to lower levels of general school engagement seen empirically in this age group. Table 11 details the models compared in this aim.

Table 11. *Tests of Invariance for Factor Structure for Early- and Mid--Adolescent Cohorts*

Model	χ^2	df	$\Delta\chi^2$	Δdf	p	RMSEA	RMSEA*	SRMR	CFI	AIC
1. Combined	33.74	28	-	-	0.21	0.03	0.03	0.04	0.98	107.74
1a. Mid Adol	71.88	68	34.1	29	0.35	0.02	0.02	0.07	0.98	145.88
1b. Early Adol[a]	-	-	-	-	-	-	-	-	-	-
2. Metric	148.4	120	115	92	0.04	0.04	0.05	0.09	0.92	324.44

* RMSEA corrected for the number of groups. *Note.* Early Adolescent model does not converge. Negative error variance values present.
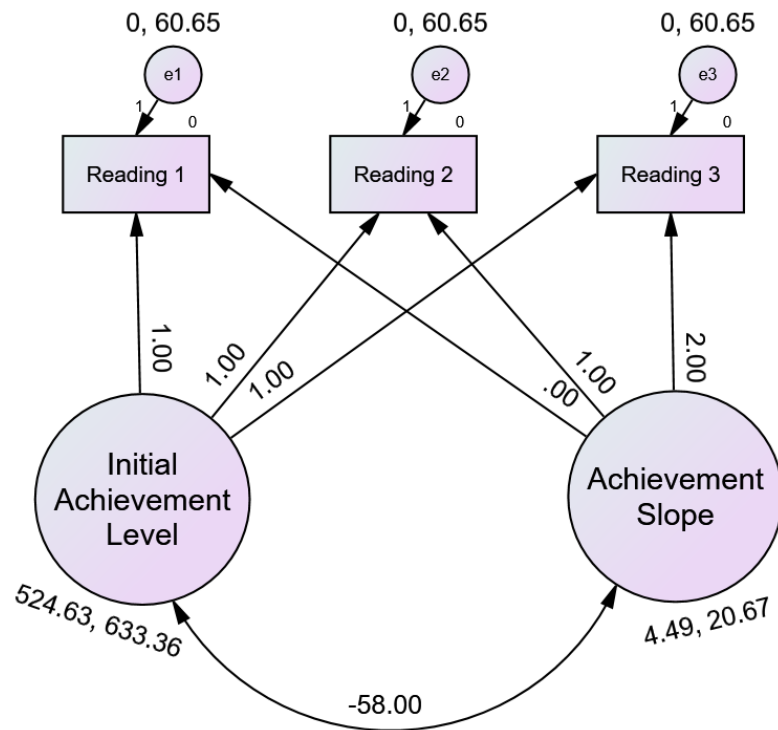
Configural invariance testing was the first step in comparing the cohort models. After establishing a model with the two cohorts combined in Aim 1, the models were run using only data from each cohort separately. Table 10 shows that the mid-adolescent model performed similarly to the combined model. The early-adolescent model did not converge, likely due to negative error variances for School Engagement (e4) and Academic Achievement (d4). These inadmissible values may have indicated that the model is misspecified for the early adolescent group. However, it may have also been that the sample size ($n = 98$ for this model) is insufficient for testing. To gain further information on the relationship between measured and latent variables for the two cohorts, metric invariance testing was done next. Metric invariance tests the assumption that the scales of the latent variables are the same across age cohorts. This model exhibited poor fit statistics [$\chi^2(62) = 82.09$, $p < .05$; RMSEA corrected = .058; CFI = .93, SRMR = .074], indicating that the relationship between measured and latent variables is not the same across age cohorts. Given the lack of invariance here and the misspecification seen during configural invariance testing, further tests were not conducted.

Research Aim 3. Given the general and developmental characteristics of achievement paths as established by the other aims, the final goal of the study was to understand which factors in each stage best predicted growth in academic achievement.

RQ3 What factors influence growth in academic achievement for foster youth?

A latent growth model was developed for this research aim to model variation in and predictors of growth in reading achievement and math achievement. Three time points of Woodcock-Johnson W scores for Letter Word Identification (reading) and Applied Problems (math) were used. W scores meet the model requirement for non-standardized scores that can demonstrate growth. Results for the reading achievement model are discussed first.

The unconditional model for reading achievement, seen in Figure 7 below exhibited adequate fit [$\chi^2(3) = 0.716$, $p = .86$; RMSEA CI $= 0.000 - 0.072$ (interval acceptable when values beyond 0.10 are excluded); CFI $= 1.00$, SRMR $= .003$]. Residual variance constraint was held. Means and variances of the initial construct level and slope in the unstandardized model were of importance here. The mean level of reading achievement was 524.63 points, while the variance in reading achievement was 633.36 points ($p < .001$), indicating significant variability in the initial reading achievement level of participants. The mean slope was 4.49 ($p < .001$) and variance in slope was 20.67 ($p < .01$), indicating a significant amount of growth on average in reading achievement over time as well as significant variability in the growth experienced across participants. The correlation (coefficient in Figure 7 above is covariance) between initial level and slope for reading achievement was significant as well (-.51, $p < .001$), which meant that adolescents with higher levels of initial reading achievement experienced slower rates of growth than their initially lower achieving peers.

0, 60.65   0, 60.65   0, 60.65

e1   e2   e3

1   0   1   0   1   0

Reading 1   Reading 2   Reading 3

1.00   1.00   1.00   1.00   2.00
                   .00

Initial   Achievement
Achievement   Slope
Level

524.63, 633.36   4.49, 20.67

-58.00

Chi-Square = .757
df = 3
p = .860
CFI = 1.000
RMSEA = .000

Figure 7. Unconditional Reading Achievement Growth Model

The conditional growth model of reading achievement contained explanatory predictors. As discussed in the analytic strategy, relevant variables entered here coincide with the strongest indicators of latent variables from Aim 1: Relationship with Caregiver, School Engagement, and Maladaptive Coping. Age was also entered to further examine cohort differences. The model demonstrated good fit [$\chi^2(12) = 9.74$, $p = .64$; RMSEA = 0.000 – 0.069 (interval acceptable when values beyond 0.10 are excluded); CFI = 1.0, SRMR = .046] with these predictors. Modification indices suggested a defensible

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correlation between School Engagement and Maladaptive Coping, given their joint loading to the Resilience latent factor. Hypotheses were partially supported. Age significantly predicted both initial reading level and slope ($p < .001$), indicating that for every additional year of age, students started an average of 4.54 points higher on reading achievement and experienced a decrease in growth of 1.51 points per year increase in age. Figure 8 below shows this conditional model with unstandardized estimates and significant paths shaded purple.
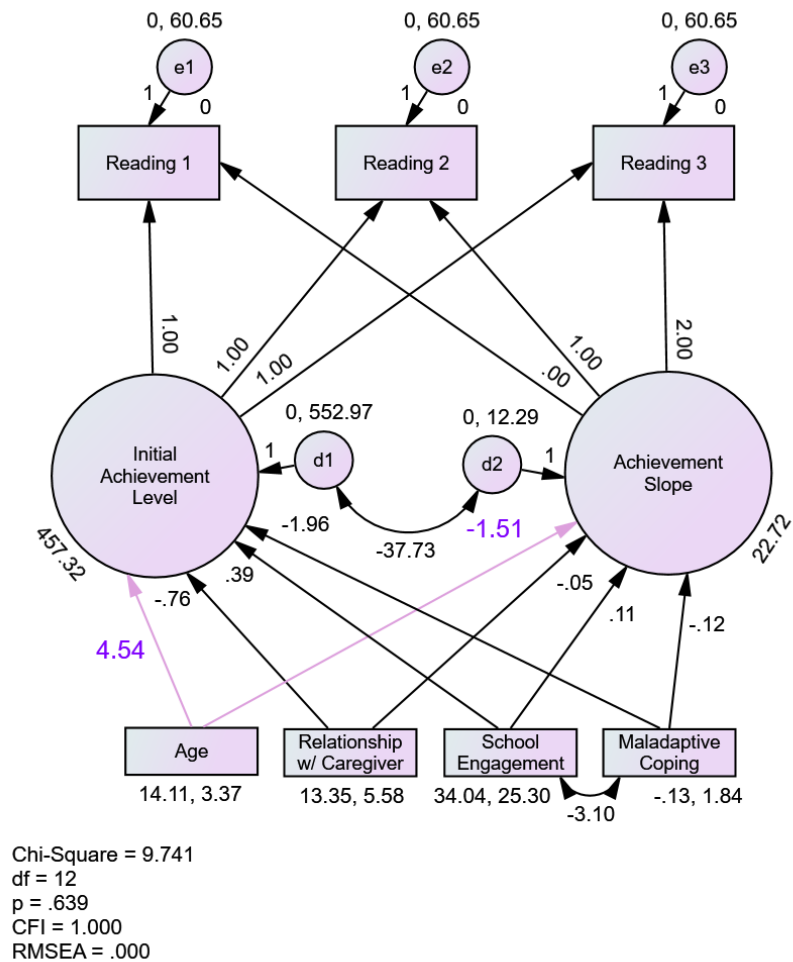

Figure 8. Conditional Reading Achievement Growth Model

Turning to math achievement, the unconditional model in Figure 9 without

residual variance constraint yielded a good fit [$\chi^2(1) = 0.098$, $p = .75$; RMSEA CI $= 0.000$

$- 0.15$; CFI $= 1.00$, SRMR $= .0001$].
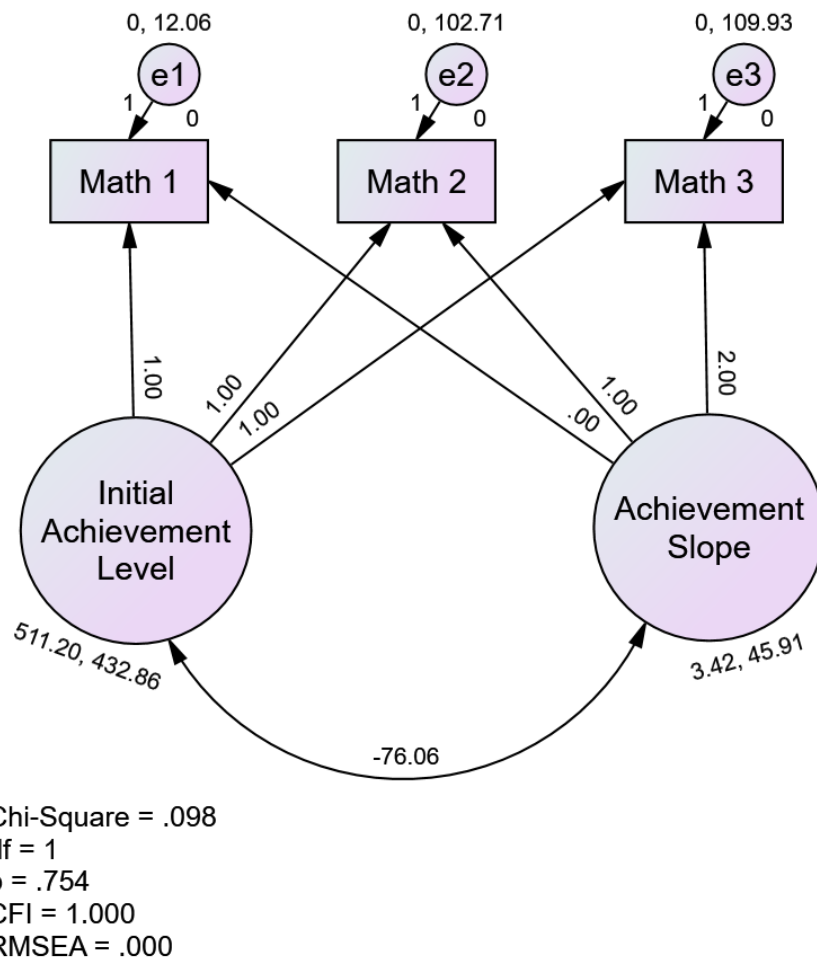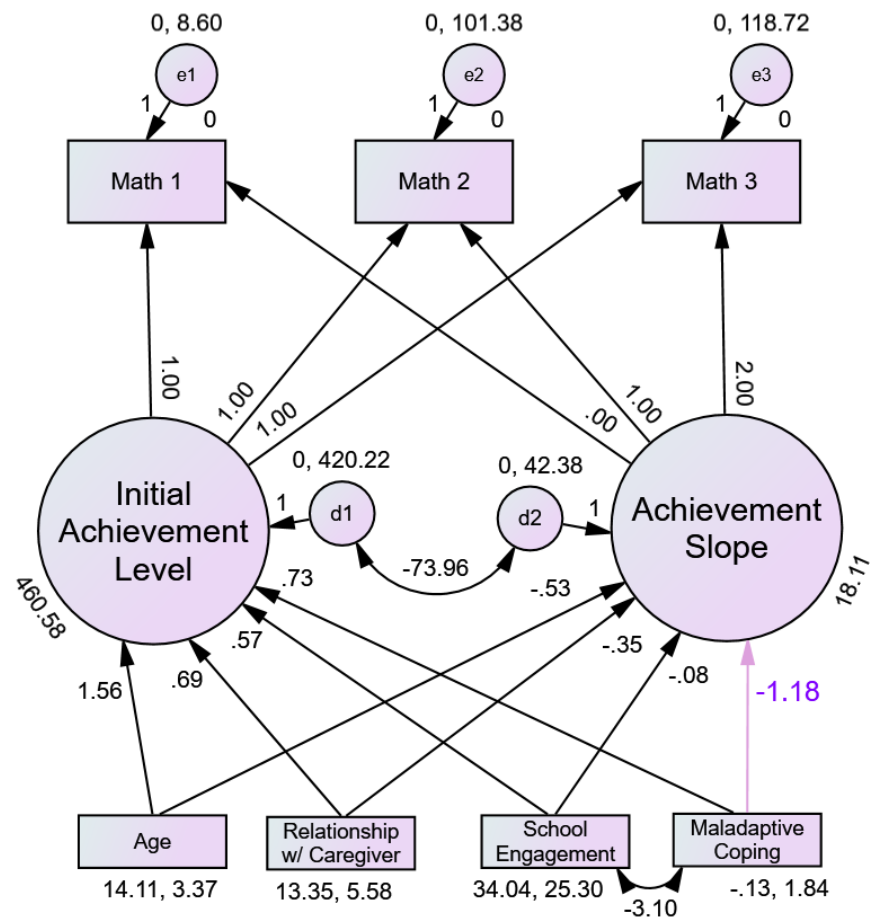

Figure 9. Unconditional Math Achievement Growth Model

Means and variances of the initial math achievement level and slope were

significant. Initial math achievement had a mean of 511.20 points and a variance of

432.87 points ($p < .001$), indicating significant variability in average starting levels of

math achievement across the sample. Similarly, mean math achievement slope was 3.42

($p < .001$) with a variance of 45.91 ($p < .05$), which demonstrated significant average growth in math achievement as well as variability in that growth across participants. The correlation between math achievement initial level and slope was -.54, ($p < .01$), indicating a similar relationship to reading achievement with early high achievers experiencing lower growth in scores than early low achievers.

Figure 10. Conditional Math Achievement Growth Model

The conditional model of latent growth, seen in Figure 10, in math achievement with the same predictors demonstrated good fit when School Engagement and Maladaptive Coping were correlated[χ^2(10) = 13.14, p = .216; RMSEA =.055; CFI = .99, SRMR = .048]. In this model, Maladaptive Coping significantly predicted math achievement slope ($p < .05$), which indicated that each one point increase in maladaptive coping skills translated to a 1.18-point decrease in math achievement growth over time. Students who exhibit internalizing and/or externalizing behaviors experience slowed growth in their math achievement.

In sum, findings showed that predictors of academic success for foster youth can be modeled. As seen in Aim 1, relationships with caregivers and adults, engagement in the academic environment, and activities for resilience all influenced math and reading achievement. Aim 2's results suggested that developmental factors such as age played a large role in academic achievement for foster youth. Students in middle and high school may experience different contextual determinants of academic achievement. Additionally, Aim 3 demonstrated that students in foster care had disparate achievement trajectories that vary both in their initial levels of achievement and in the subsequent growth in achievement experienced over the years. Growth tended to slow with age, suggesting a leveling off of math and reading achievement such that students end up at similar levels regardless of their starting point. Age, again, was a good predictor of this variability for reading achievement, and maladaptive coping predicted this decrease in growth for math achievement. The aims of this study worked together to reinforce the

message that foster youth are navigating multifaceted academic spaces, the implications

of which may be not well captured with extant data collections.

CHAPTER 5: DISCUSSION

This study examined factors that predicted academic achievement in foster youth and how those factors related to development and growth in achievement. Foster youth experience life events that may uniquely impact their academic achievement and thus require special attention. Using the framework of Spencer's 1995 PVEST theory of contextual and behavioral influences on life outcomes, determinants of academic achievement outcomes were modeled. This chapter focuses on discussing the study's findings as they relate to extant research. The contributions made by the study as well as future avenues of research are detailed as well.

The child welfare system is in crisis. Cases of children, youth, and families needing services continue to grow as caseworkers leave their highly demanding positions at alarming rates; national rates of turnover average 30-40% (United States Government Accountability Office, 2006). Spending on child welfare continues to plummet as federal support is withdrawn, leaving states across the nation scrambling to cover the budget shortfalls (Rosinsky & Connelly, 2016). In 2015, a federal judge ruled that the long-term foster care in Texas, a state with one of the largest populations of maltreated children (National KIDS COUNT, 2014), was "broken," having violated children's 14th Amendment rights by failing to keep them free from "rape, abuse, and psychotropic medication and instability" while under the care of the state ("Stukenberg et al. v. Greg Abbot, et al.," 2015). Regardless of where fault lies, the people most affected by this crisis are our nation's most vulnerable population: children and youth in foster care.

When society turns its attention to youth in the child welfare system, certain needs take priority. The physical health and safety as well as the mental well-being of foster youth are the primary concern of the public and of the agencies tasked with their care, and the vast majority of child welfare agency resources are expended on these efforts (Rosinsky & Connelly, 2016). These overtaxed systems leave little available then for seeing to the educational success of foster youth. In 2014 nationally, only 2% of federal spending went towards preparing youth to transition from foster care (Rosinsky & Connelly, 2016). As a result, these young people have academic needs that are poorly understood and insufficiently addressed in practice. For youth in a system where support is typically withdrawn after high school, academic success at the secondary level is critical to future life success. Foster youth must be prepared for adult living, whether that means attending college or beginning a career, and they must achieve this readiness by the end of high school. If we as a society are to serve these vulnerable citizens justly, we must provide the resources to ensure they can thrive and not merely survive.

As with many vulnerable populations, research tends to hold a deficit view of foster youth, identifying the sources and outcomes of risks these youth face (Slack, et al,, 2004; Slade & Wissow, 2005; Zetlin, Weinberg, & Shea, 2006; Zorc et al., 2013). While it is an important first step to understand the pejorative effects of maltreatment, our work must not stop here. It is an equally important next step to identify sources of resilience for youth that exist within their environments and circumstances. Adopting a strengths-based approach to studying foster youth leads to greater life success for them because such research contributes to the development of best practices that connect foster youth with

the resources they need to thrive. To that end, this study sought to identify sources of academic resilience within the lives of foster youth that relate to their academic success.

A STRUCTURAL APPROACH TO ACADEMIC RESILIENCE

Using Spencer's 1995 Phenomenological Variant of Ecological Systems Theory (PVEST) as a theoretical framework, the present study examined a variety of factors that contribute to academic achievement. The first research aim was an organization of these factors into a path model that could predict achievement for foster youth. PVEST posits that the interactions an individual has with his or her environment function as stages of impact on a specific outcome. The risks and protective factors that foster youth face influence the perceptions of their environment. These perceptions in turn determine how foster youth will react to certain situations. These reactions, repeatedly performed, solidify into an identity. This self-appraisal and identity act to influence the outcome of interest, achievement here. Using data from the National Survey of Child and Adolescent Well-Being (NSCAW), variables that fit into each stage were identified and analyzed first as an SEM measurement model. Four latent variables emerged with statistical validity. These latent factors were characterized as the stages of the PVEST model: Net Vulnerability, Net Stress Engagement, Resilience (not a defined stage and thus a slight departure from this theory), and the life stage outcome of Academic Achievement (math and reading achievement). This section discusses first the structure of the latent factors and then the significant predictors of achievement.

The first latent variable, Net Vulnerability, was positively indicated by protective factors and caregiver relationship. This stage represented environmental factors that serve

to hinder or bolster an individual (Spencer, 1995). Both of these variables centered on relationships with the adults in a foster youth's life, and the value of such relationships was in line with extant literature. Having adults, and particularly foster parents, who offer academic support by encouraging educational endeavors, listening to the youth's struggles, and cultivating a warm, rich home environment improves achievement by providing a source of comfort and consistency during stressful transitions (Mitchell, Kuczynski, Tubbs, & Ross, 2010; Cheung, Lwin, & Jenkins, 2012).

Net Vulnerability positively predicted both Net Stress Engagement and Resilience. Foster youth with vulnerability mitigated by good relationships with adults are better engaged in their academic environments and exhibit more activities for resilience. CASA (Court Appointed Special Advocate) volunteers are an excellent example of non-caregiver support for foster youth. These adults guide youth through their legal proceedings and represent the youth's best interests. CASA volunteers build a strong bond with the foster youth for whom they advocate. Children with CASA volunteers have been found to do better academically and have fewer conduct problems, are more likely to be adopted and find permanent homes, and have a more positive outlook in the future (National CASA Association, 2014). Net Vulnerability also had a significant indirect effect on academic achievement. It is likely that Resilience—having a modest but directly insignificant relationship with achievement—mediated the relationship between Net Vulnerability and achievement. These findings suggest that foster youth who have good relationships with adults in their lives use the encouragement and strength from those relationships to engage in activities for resilience and positive

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youth development, such as staying connected to extracurricular activities, developing close friendships, and participating in the upkeep of their home environments as well. These activities help develop coping skills and self-care opportunities that contribute to academic achievement.

The second factor, Net Stress Engagement, was characterized by school engagement and poor relationships with peers. In this stage of PVEST, a youth's perceptions of his or her environment are highlighted (Spencer, 1995). Here, school engagement was a positive indicator with net stress engagement while poor relationship with peers, in which a higher score indicates greater feelings of loneliness and isolation, was negatively associated with Net Stress Engagement. Much like adults, peers can offer motivation and comfort to foster youth (Hass & Graydon, 2009). Having this source of support at school can prepare foster youth to cope more positively with the rigors of education as well as with their personal circumstances.

In the PVEST model, the third and fourth stages are Reactive Coping Methods and Emergent Identities, respectively. These stages represent the behaviors in which an individual engages to respond to the stressors he or she experiences, followed by the enduring identity that emerges as a result of those consistently repeated behavioral patterns (Spencer, 1995). Here, results diverge from the theoretical model. Two separate latent factors were not observed from the current data. Instead, a single factor that was indicated by all variables from these two stages best fit the data. This factor was named Resilience and was indicated positively by adaptive coping, social identity, and academic identity while having a negative relationship with maladaptive coping. The divergence

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from theory here may have been due to the nature of available variables from the existing dataset used in the study. These four variables all represent behavioral measures. While such variables are appropriate to Reactive Coping Methods (adaptive and maladaptive coping), Emergent Identities is conceptualized as a self-appraisal construct (Spencer, 1995). The NSCAW dataset did not contain any variables that measured foster youth's perceptions of themselves or their identity. All relevant measures were behavioral in nature, so social identity and academic identity capture skills and performance instead of self-concepts. This finding reveals a gap in perception research for foster youth. Researchers ask these youth about what they do but fail to inquire more abstractly on how they feel about themselves and how they view themselves. More research on self-concepts by foster youth is needed to understand and identify further sources of resilience for this population. Positive self-concept has been shown to mitigate stereotype and identity threat and improve achievement for foster youth (Sherman et al., 2013). When foster youth develop positive ideas about themselves, these appraisals can serve as a buffer against stressors in the environment, which is why Spencer (1995) also labels this identity stage as stable coping mechanisms. Moving beyond measurement issues though, these behavioral measures seemed to indicate activities for resilience. That is, they all described various behaviors that promoted academic resilience in the face of vulnerability and stress.

Overall, findings for the first research aim generally support an ecological model of academic resilience for foster youth. Contexts such as home environment and school settings both contribute to the educational experiences that youth have. These contexts

influence the behavior of youth by encouraging adaptive strategies for handling stressors and further developing positive behaviors, which enhance academic achievement.

DEVELOPMENTAL DIFFERENCES

The second aim of the study was to explore age-based developmental differences for foster youth. The sample was divided into early- and mid-adolescent cohorts to represent middle school and high school age foster youth. Participants in the early adolescent cohort ranged in age from 11 to 13 years old, while the mid adolescent cohort participants ranged in age from 14 to 17 years old.

A multi-group model was tested in which the path model established in Aim 1 was analyzed separately for the two age cohorts and then compared. The relationships in the mid adolescent cohort were the same as the overall sample, but the model was misspecified for the early adolescent cohort; that is, the model in its present form does not accurately capture the relationships of these constructs to each other and to academic achievement for 11 to 13 year olds. Further invariance testing confirmed lack of metric invariance, which indicated that the instruments in the model were measuring different constructs.

The PVEST model originally was developed with a mid adolescent cohort aged 14 to 16 years. This model is well established to hold for this age group, so hypotheses formed for mid adolescents were generally valid. The early adolescent group may present a unique stage of development for which relationships among these factors must be re-examined. Early adolescence is a developmental period characterized by many social and emotional changes in self and cognition (Ackerman & Izard, 2004). Emotions evolve and

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change rapidly at this age, so the relationships among the variables in the model may exhibit greater instability as middle schools constantly re-evaluate their emotional ties. As adolescents mature from the early to middle stages, their emotional regulation improves (Graber, 2004). It is possible that this settling of emotions improves stability of the measured variables for the mid adolescent cohort.

GROWTH IN ACHIEVEMENT

The third and final research aim was to understand which factors best predict growth in academic achievement. To accomplish this analysis, latent growth curve modeling was used with three time points of non-standardized scores on math achievement and reading achievement in separate models. Unconditional models were first created to establish patterns of growth in the sample. Participants varied significantly in their initial levels of math and reading achievement as well as the growth experienced in their achievement scores over time. Foster youth begin at different levels of achievement and have a variety of changes in their achievement as they age, much like their peers with no child welfare involvement (Barton, 2009). Foster youth who begin as higher achievers in math and reading experienced less growth than their peers who began as lower achievers. This suggests that growth levels out as foster youth make gains in achievement, and the variation in achievement decreases over time.

After establishing variability in achievement growth, conditional models using the variables from Aim 1's path model were included along with age. Age predicted initial levels of reading achievement (positive) as well as the growth in reading (negative). As expected, older foster youth perform better at reading tasks and growth slows as foster

youth age. This is likely due to practice effects, seen often with the repeated re-administration of achievement tests (Hausknecht, Halpert, Di Paolo, & Gerrard, 2007). For math achievement, maladaptive coping negatively predicted growth in achievement scores. Foster youth who engaged in delinquent behaviors or exhibited more depressive symptoms experienced a slowed growth in achievement. These findings are consistent with the literature that shows maladaptive coping strategies negatively affect achievement, whether they are internalizing behaviors like anxiety and depression (Weidman, Augustine, Murayama, & Elliot, 2015) or externalizing behaviors like aggression that lead to suspension and expulsion at higher rates for foster youth (National Working Group on Foster Care in Education, 2014).

IMPLICATIONS FOR BEST PRACTICES: REDUCE SCHOOL MOBILITY

The findings of this study can inform many practices and policies for ensuring academic success for foster youth. Findings showed that relationships with supportive adults, better academic engagement, and positive coping strategies are shown here to predict achievement. Thus, one way to improve foster youth's access to these resources is to decrease the number of schools attended throughout their tenure in the system. Policies that reduce school mobility should be a primary goal of child welfare agencies and education administrations as they make placement decisions and school arrangements for foster youth. When foster youth are able to remain in the same school, even or perhaps especially across placements, they can maintain contact with peers who help ground them in their academic environments and offer them support (Hass & Graydon, 2009). Foster youth are also better able to progress more smoothly and remain on a steady educational

track when they can keep their credit hours and elective courses carrying forward (Zetlin, Weinberg, & Shea, 2006). Additionally, having a steady school environment can promote engagement at school as foster youth remain anchored to their peers, teachers, and courses. As Flannigan and Bentley-Edwards (2016) demonstrate, teachers are a main point of contact for foster youth, so the perceptions that these educators hold is important. Empowering teachers with the tools to create a better culture of care around foster youth within the school environment can ensure that these youth maintain positive connections with school. To these ends, policymakers should support initiatives that increase teacher competency around the lives of youth in the child welfare system, and school districts should focus on policies that limit school mobility.

LIMITATIONS

While the present study has made several contributions to the knowledge surrounding academic resilience among foster youth, some limitations should be noted. The study's aims may have been hindered by missing data for certain variable types, the analytic constraints of the existing data set, and the absence of certain types of information from the data set. One of the advantages of using the NSCAW dataset is the presence of the multiple informant sources. NSCAW contains data reported by youth themselves, their caregivers, caseworkers, and teachers. A major issue with this dataset, however, is the high amount of missing teacher report data and variables related to academics. The focus of this study has been to examine educational contexts. Several variables that would have been valuable to have in the present analysis, including special

educational needs and relationships with teachers, had too much missing data to be used, some up to 70% missingness.

Teachers are a valuable source of information for educational contexts, so this translates to a loss of important information on foster youth's academic outcomes. Additionally, grade equivalent achievement scores were frequently missing. These scores would have enabled further comparisons across the age cohort to see if foster youth were performing at grade level. Some of these variables were recovered by seeking similar information provided by another informant, but such substitution was not always possible and, regardless, represents a different perspective than that of an educator. Even with these missing variables, the current study still provides new insight into a holistic view of environmental and developmental factors that combine to influence academic achievement.

A second issue is the use of the weight variables during analysis. NSCAW is a nationally representative dataset with an unequally weighted, stratified, clustered design. To analyze data while maintaining the national representativeness, weight variables were provided with each wave of data. These weights, however, will not work when only subsamples of the data are used because the weight algorithms represent probabilities of selection that only hold in the full sample. Thus, the present results may not be nationally representative and generalizable to the entire population of youth who reside in some form of out of home care. Subsequent analyses that include the full sample and utilize the weights may provide a more complete picture of foster youth across the country. The

present sample still contains foster youth and their experiences, so the results remain applicable to middle and high school age foster youth.

A third limitation, mentioned in the discussion of Research Aim 1's findings, is the type of data collected by NSCAW. The measures tend to be behavioral in nature, and few measures that capture self-appraisals and identity as reported by the youth are present. Working with existing data sets necessarily limits analysis to the variables present, but the particular framework used for this study is better suited when self-appraisal data is available. This lack of self-perception data likely resulted in the collapse of the factor structure in the first study aim and may have contributed to other relationships being statistically insignificant. Even in the absence of self-concept measures, the latent factors still coalesced, suggesting that behavioral measures are still valuable contributors to academic achievement for foster youth.

A fourth limitation to the current study is the lack of a non-maltreated comparison group. The argument is made that several factors exist that are unique to foster youth and operate in unique ways for this population, but this assumption cannot be tested in the absence of a non-maltreated sample. Some relationships among the factors in the study may change for youth who have not been involved in the child welfare system, and even the type of maltreatment experienced (neglect versus sexual abuse, for example) may create additional sources of variability in outcomes. Nonetheless, the present study portrayed a variety of influences on academic achievement for foster youth.

FUTURE DIRECTIONS

Beyond the findings of this study, several new directions for exploring academic resilience in foster youth are presented. The study demonstrated that age played a role in examining academic achievement. Studies should examine correlates of achievement for the early adolescent, middle school years more closely. Identifying contextual factors that influence achievement for middle school foster youth can guide interventions tailored to this age group and better prepare them for the high school academic environment and beyond.

Future research also should focus on creating profiles of academic resilience using cluster analysis and logistic regression. By incorporating a strengths-based approach that examines what works along with why and how it works, the field can focus on what academic success looks like in order to replicate such success for current and future youth in the child welfare system. Having a model of high achieving foster youth and the predictive factors of this success would greatly advance best practices in connecting youth with the resources and tool needed for success, and incorporating a longitudinal design would allow researchers to understand how timing of different intervention efforts could play a role in achievement.

Additionally, layers of such analysis could contribute to the understanding of disparate racial and gender effects for foster youth. Currently, research is often race-comparative, demonstrating differences among different ethnic groups on the same constructs while holding certain variables constant. Such research, while theoretically informative, may have less practical implications because such constraints do not apply in our society of complex racial hierarchies and systemic and institutional inequity. It also

treats ethnic groups as monolithic and overlooks diversity in academic achievement within racial/ethnic groups. Intra-racial and intra-ethnic analyses are more useful to conduct, so as to compare, for instance, African American youth who are high versus low achieving. Comparisons when done in this manner better mirror differences found in the real world, or least offer results that can be implemented in real world settings—a child's ethnicity and the societal weight of that ethnicity cannot be changed—versus inter-racial comparisons. Research on gender effects should follow a similar pattern with contextual differences being compared with instead of across gender.

CONCLUSION

The goals of this study were to identify sources of academic resilience for youth in the child welfare system residing in foster care. These youth often have their educational needs overlooked due to overtaxed child welfare systems in crisis that must focus resources to prioritize health and safety. Additionally, while many of the disparaging effects of foster care and maltreatment have been empirically explored, sources of strength and resilience are less frequently identified for this population. Using Spencer's 1995 PVEST framework to develop an ecological model via structural equation modeling, sources of environmental and developmental resilience were identified.

Relationships with adults and peers, school engagement, and resilience-promoting behaviors were among some of the important sources of strength from which foster youth draw to maintain good academic progress and achievement in reading and math. Age was also shown to play a role in academic achievement as well, with factors being more

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readily identified for mid adolescent high school age foster youth than their middle school counterparts. Future research needs to delve more deeply into sources of resilience relevant to the early adolescent years of a foster youth's life. This study contributes a holistic view of resilience factors for foster youth that was previously absent in the literature. The interplay among ecological factors coupled with the causal inferences that can be drawn using a longitudinal data set offer a unique nuance to studies in foster youth populations by identifying concrete sources of academic resilience for youth in the child welfare system. The findings together highlight the need for policies and practices that promote school stability and keep foster youth in a steady academic environment where they can make friends, participate in elective activities, and maintain an involved home life.

Foster youth may be a vulnerable population within a broken system, but they are neither helpless nor hopeless. We cannot end our support of these youth at their removal from unsafe environments. We must offer them a way up, not just a way out. Education is a powerful resource, and we are obligated to provide our most vulnerable citizens with opportunities for resilience and success. When school is made a priority, foster youth can do more than survive. They can thrive.

APPENDICES

APPENDIX A

MEASURES

Demographic Variables from Child Household Module (NSCAW)

1. Age at Wave One: 11 to 17.5 years

2. Gender: Male or Female

3. Race/ethnicity (reported by Child, no inferences from interviewer permitted)
   - Hispanic or Latino
     - No
     - Mexican, Mexican-American, Chicano
     - Puerto Rican
     - Cuban
     - Other
   - Race
     - American Indian or Alaska Native
     - Asian
     - Black or African American
     - Native Hawaiian or other Pacific Islander
     - White
     - Don't know

4. Type of Out-of-Home Setting
   - Foster home
   - Kin-Care setting (Relative's Home)
   - Treatment foster care, Specialized foster care, or Family foster agency
   - Group home or Residential facility
   - Some other out-of-home care arrangement

5. Length of time in out of home care: reported in days, weeks, months, or years

6. For each measure, the informant: Child, Caregiver, or Teacher

Neighborhood Factors - Philadelphia Family Management Study, Parent Interview Schedule (Furstenberg, 1990).

Prompt: Now I'd like to ask you some questions about your neighborhood and community. For each item I read, please tell me if this issue is not a problem at all, somewhat of a problem, or a big problem in your neighborhood.

Answer Scale for These Interview Questions:
- o *Not a Problem at All*
- o *Somewhat of a Problem*
- o *A Big Problem*

1. Assaults and muggings?
2. Delinquent gangs or drug gangs?
3. Open drug use or drug dealing?
4. Unsupervised children?
5. Groups of teenagers hanging out in public places and making a nuisance of themselves?

Please think about how your neighborhood compares to most other neighborhoods.

6. Is your neighborhood…
   - o safer,
   - o about the same, or
   - o not as safe as most neighborhoods?

7. Does your neighborhood have…
   - o more neighbors help each other
   - o about the same number of neighbors help each other, or
   - o fewer neighbors help each other than most neighborhoods?

8. Does your neighborhood have…
   - o more involved parents,
   - o about the same number of involved parents, or
   - o fewer involved parents than most neighborhoods?

9. Is your neighborhood…
   - o a better place to live,
   - o about the same, or
   - o a worse place to live than most neighborhoods?

Special Educational Needs of the Child (NSCAW).

Please consult the student's folder, as necessary, in order to answer the special education items below.

Answer Scale for These Interview Questions:
- *Yes*
- *No*
- *Don't Know*

1. Does this student have any physical, emotional or mental condition which interferes with or limits his/her ability to do regular school work at grade level?

2. Does this student have any physical, emotional or mental condition which interferes with or limits his/her ability to take part in sports, games, or other activities with students his/her age?

3. Has this student EVER been classified as needing special education? That is, has he/she ever been given an Individual Education Plan (I.E.P.) or an Individualized Family Services Plan (I.F.S.P.)?

4. Is this student currently receiving special education? That is, does he/she currently have an Individual Education Plan (I.E.P.) or an Individualized Family Services Plan (I.F.S.P)?

Questions 5 through 13 should only be answered if you responded YES to Question 3 above (that is, the student has special educational needs).

5. How is the student classified? What is the PRIMARY special education handicapping code? Mark an X in <u>one</u> box

- Autism.
- Deafness.
- Emotional disturbance.
- Hearing impaired.
- Mental retardation.
- Multiply disabled.
- Orthopedic impairment.
- Specific learning disability.
- Speech or language impairment
- Traumatic brain injury
- Visual impairment including blindness
- ADHD (Attention deficient hyperactive disorder).

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o Developmental disability
o Other health impairment.

6. As part of the Individual Education Plan (I.E.P), does this student have any SECONDARY handicapping codes or problems? Mark an X in *each* box that applies.

    o Autism.
    o Deafness.
    o Emotional disturbance.
    o Hearing impaired.
    o Mental retardation.
    o Multiply disabled.
    o Orthopedic impairment.
    o Specific learning disability.
    o Speech or language impairment
    o Traumatic brain injury
    o Visual impairment including blindness
    o ADHD (Attention deficient hyperactive disorder).
    o Developmental disability
    o Other health impairment.

7. Is this child being educated in a:

                                                                               Yes No

a) Regular class (i.e., general education)? .... ☐   ☐

b) Special school? .... ☐   ☐

c) Special class in a regular school (i.e., self-contained) .... ☐   ☐

d) Resource room (i.e., special education/services are provided outside the regular classroom for 21-60% of the day)? .... ☐   ☐

8. About what portion of the school day is this student served by special education?
    o 0%
    o 25%
    o 50%
    o 75%
    o 100%
    o Don't know

9. Approximately how many years of special education instruction have been provided for this student, including kindergarten?

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- 1 year or less
- 2 - 4 years
- 5 years or more
- Don't know

10. What agency provides (delivers) the special education instruction to the student? Select as many agencies as apply.
    - Public school
    - Private school or program
    - Social Service (child or family welfare) agency
    - Mental health agency
    - Public health (including substance abuse) agency
    - Private community-based agency
    - Other agency

The next questions are about other services the student or his/her family may be receiving to support his/her disability or special educational needs.

11. Which of the following services is the student or his/her family receiving? Mark an X in _each_ box that applies.
    - Speech-language pathology and/or audiology services?
    - Psychological services?
    - Physical and/or occupational therapy?
    - Recreation/therapeutic recreation services?
    - Social work services?
    - Counseling services, including rehabilitation services?
    - Orientation and mobility services?
    - Medical services for diagnostic and evaluation purposes?
    - Special transportation services?
    - Parenting classes?
    - Assistive technology services?
    - Assistive technology devices?
    - Transition from preschool to elementary school services?
    - Transition from secondary school to post-secondary school services?
    - Any other services to address the student's disability or special educational needs?

12. What is the involvement of the child's parent or caregiver in the decision-making regarding the child's special education and related services? Mark an X for _all_ that apply.
    - Participates in meetings regarding the child's Individualized Education Program (IEP)
    - Is actively and regularly involved with the school

- Is actively and regularly involved with other agencies providing services to the child
- Receives assistance or services from a training center for parents of children with disabilities.
- Not involved at all

13. Overall, do you believe the student is receiving the appropriate special education and related services needed to address his/her disability?
    - Yes, definitely
    - This child is receiving some education and services, but they could be improved
    - No, this child is not receiving the education and services he/she needs

Relationship with Caregiver (Wellborn & Connell, 1987).

Prompt: Now I want to ask you about your relationship with your Caregiver. I am going to read a list of different statements and for each one I want you to tell me how true the statement is about you. Remember that your answers are private. Please tell me what you really feel or think.

Note: Students are asked to respond to the following questions regarding two caregivers, resulting in 24 questions.

Answer Scale for These Interview Questions:
- o *Not at all True*
- o *Not Very True*
- o *Sort of True*
- o *Very True*

1. When I'm with my caregiver, I feel good.
2. When I'm with my caregiver, I feel mad.
3. When I'm with my caregiver, I feel unhappy.
4. My caregiver enjoys spending time with me.
5. My caregiver does a lot to help me.
6. My caregiver doesn't seem to have enough time for me.
7. My caregiver doesn't seem to know how I feel about things.
8. My caregiver trusts me.
9. My caregiver doesn't let me make any of my own decisions.
10. My caregiver is fair with me.
11. My caregiver doesn't think I can do very much.
12. I don't know what my caregiver wants from me.

Resilience Factors (Runyan et al., 1997).

Prompt: The next questions are about whether or not there are adults that you can count on to help you with problems that come up. There are also a few questions about the kinds of things that may make you feel better.

Answer Scale for These Interview Questions:
- *Yes*
- *No*

1. Is there an adult or adults you can turn to for help if you have a serious problem?
2. Do you feel you can go to a parent or someone who is like a parent with a serious problem?
3. Could you go to another relative (not a parent) with a serious problem?
4. Has there ever been an adult outside of your family who has encouraged you and believed in you?
5. Would you say this person has made a difference in your life?

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6. How important is religion or spirituality to you? Would you say...
- not important at all
- only a little important
- somewhat important, or
- very important

7. Over the past year, how many times did you go to church, synagogue, or attend religious or spiritual services or activities? Would you say...
- never
- rarely or occasionally
- once or twice a month, or
- once a week or more

Loneliness and Social Dissatisfaction Questionnaire for Young Children (Asher & Wheeler, 1985).

Prompt: Now I am going to read you different sentences and for each one I want you to tell me how often these things are true about you. For each sentence, pick one answer from this card.

For example, suppose I read the sentence "I like to do homework" and then I ask you "How often is this true about you?" If you never like to do homework, you would tell me "never." If you hardly ever like it, tell me "hardly ever." If you sometimes like it, tell me "sometimes."

Answer Scale for These Interview Questions:
- *Never*
- *Hardly Ever*
- *Sometimes*
- *Most of the Time*
- *Always*

1. It's easy for me to make new friends at school.
2. I have nobody to talk to at school.
3. I'm good at working with other kids at school.
4. It's hard for me to make friends at school.
5. I have lots of friends at school.
6. I feel alone at school.
7. I can find a friend when I need one.
8. It's hard to get kids in school to like me.
9. I don't have anyone to play with at school.
10. I get along with other kids at school.
11. I feel left out of things at school.
12. There are no kids at school that I can go to when I need help.
13. I don't get along with other kids at school.
14. I'm lonely at school.
15. I am well liked by the kids at school.
16. I don't have any friends at school.

Your Relationship with the Student (NSCAW).

1. Which subject areas do you teach the student currently? Mark an X in *each* box that applies.
    -   o Self-contained classroom
    -   o Language arts
    -   o Reading
    -   o Social studies
    -   o Science
    -   o Mathematics
    -   o Arts (e.g., art, music)
    -   o Enrichment or gifted
    -   o Health
    -   o Electives or exploratories
    -   o Physical education
    -   o Vocational or technical
    -   o Resource
    -   o Other

2. What is the average size of the classes you teach that include this student?
    -   o Less than 10 students
    -   o 10 - 15 students
    -   o 16 - 20 students
    -   o 21 - 25 students
    -   o More than 25 students

3. How long have you known the student?

    _____Months

4. How well do you know this student?
    -   o Not well
    -   o Moderately well
    -   o Very well

Drug Free Schools (DFSCA) Outcome Study Questions (US Department of Education, 1989).

Prompt: Now I'm going to ask you how often you have different types of feelings about school. For each question, pick _one_ answer from this card. You can pick never, sometimes, often, or almost always. For example, suppose I asked you how often you bring a lunch from home to school. If you don't ever bring your lunch, you would pick the answer "never." If you do this every once in a while, you would pick "sometimes." If you do this a lot, you would pick "often." If you always or almost always do this, you would pick "almost always."

Okay, let's start. Honest answers are important, so please tell me what you really feel or think.
Your answers will be kept private. No one will tell your family or teachers anything about your answers.

Answer Scale for These Interview Questions:
- o *Never*
- o *Sometimes*
- o *Often*
- o *Almost Always*

1. How often do you enjoy being in school?
2. How often do you hate being in school?
3. How often do you try to do your best work in school?
4. How often do you find the school work too hard to understand?
5. How often do you find your classes interesting?
6. How often do you fail to complete or turn in your assignments?
7. How often do you get sent to the office, or have to stay after school, because you misbehaved?
8. How often do you get along with your teachers?
9. How often do you listen carefully or pay attention in school?
10. How often do you get your homework done?
11. How often do you get along with other students?

Modified Self Report of Delinquency (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983).

Participants are asked to report whether or not they engaged in the following activities over the past year. Responses were dichotomously coded here.

1. Hit teacher
2. Hit parent
3. Hit students
4. Strong armed students
5. Strong armed teachers
6. Strong armed others
7. Carried hidden weapon
8. Aggravated assault
9. Gang fights
10. Sexual assault
11. Prostitution
12. Sexual intercourse
13. Pressured someone for sex
14. Physically threatened someone for sex

15. Used alcohol
16. Public drunkenness
17. Sold marijuana
18. Sold hard drugs
19. Possessed liquor

20. Stole motor vehicle
21. Stole something less than $5
22. Stole something $5-$50
23. Stole something more than $50
24. Stolen from family

25. Stole at school
26. Broke into building or vehicle
27. Did not return change
28. Credit card fraud
29. Bought stolen goods
30. Evaded payment
31. Panhandled
32. Used checks illegally
33. Fraud

34. Damaged family property
35. Damaged school property
36. Damaged other property
37. Thrown objects
38. Disorderly conduct
39. Run away
40. Cheated on school test
41. Skipped classes
42. Arson
43. Lied about age
44. Suspension
45. Obscene calls
46. Hitchhiked
47. Joyriding

Youth Self Report – Social Competence Scale, Activities (Achenbach, 1991).

Note: For each activity, if students select Yes, they are asked to provide up to three examples then asked the follow-up comparison questions.

1. Are there any sports that you like to participate in?

    a. Tell me which sports you like to take part in the most. You can give me up to 3 sports.

    b. Compared to others your age, about how much time do you spend taking part in these sports?
        ○ less than average
        ○ average, or
        ○ more than average

    c. Compared to others your age, how good are you at these sports?
        ○ below average
        ○ average, or
        ○ above average

2. Are there any hobbies, activities, and games, other than sports that you like to do?

    a. Tell me which hobbies, activities or games you like to do the most. You can give me up to 3 of these. (DO NOT INCLUDE LISTENING TO RADIO OR TV.)

    b. Compared to others your age, about how much time do you spend doing these hobbies, activities, and games?
        ○ less than average
        ○ average, or
        ○ more than average

    c. Compared to others your age, how good are you at these hobbies, activities, and games?
        ○ below average
        ○ average, or
        ○ above average

3. Do you belong to any organizations, clubs, teams, or groups?

    a. Tell me which groups you belong to that you like the most. You can give me up to 3 groups.

b. Compared to others your age, how active are you in these groups?
- o less active
- o average, or
- o more active

4. Do you have any jobs or chores? For example, a paper route, babysitting, making the bed, working in a store, etc. This includes both paid and unpaid jobs and chores.

   a. Tell me what are the main jobs or chores you have. You can give me up to 3 jobs or chores.

   b. Compared to others your age, how well do you do these jobs or chores?
   - o below average
   - o average, or
   - o above average

5. About how many close friends do you have?
   - o None
   - o 1
   - o 2 or 3
   - o 4 or More

6. On average, about how many times a week do you do things with any friends outside of regular school hours? Do not include brothers and sisters.
   - o Less than 1 time a week
   - o 1 or 2 times a week, or
   - o 3 or more times a week

Answer Scale for Interview Questions 7-10:
- o *Worse*
- o *About Average*
- o *Better*

7. Compared to others your age, how well do you get along with your brothers and sisters?
8. Compared to others your age, how well do you get along with other kids?
9. Compared to others your age, how well do you get along with your parents?
10. Compared to others your age, how well do you do things by yourself?

Social Skills Rating System – Social Skills Scale, Teacher Report, Secondary School Version (SSRS; Gresham & Elliott, 1990).

Prompt: Please read each of the following items and think about this student's behavior during the past month or two. Decide how often the student does the behavior described.

If the student never does this behavior, mark an X in the box for Never.
If the student sometimes does this behavior, mark an X in the box for Sometimes.
If the student very often does this behavior, mark an X in the box for Very Often.

	Never	Sometimes	Very Often
1. Produces correct schoolwork	☐	☐	☐
2. Keeps his or her work area clean without being reminded	☐	☐	☐
3. Responds appropriately to physical aggression from peers	☐	☐	☐
4. Initiates conversations with peers	☐	☐	☐
5. Volunteers to help peers on classroom tasks	☐	☐	☐
6. Politely refuses unreasonable requests from others	☐	☐	☐
7. Appropriately questions rules that may be unfair	☐	☐	☐
8. Responds appropriately to teasing by peers	☐	☐	☐
9. Accepts peers' ideas for group activities	☐	☐	☐
10. Appropriately expresses feelings when wronged	☐	☐	☐
11. Receives criticism well	☐	☐	☐
12. Attends to your instructions	☐	☐	☐
13. Uses time appropriately while waiting for your help	☐	☐	☐
14. Introduces himself or herself to new people without being told	☐	☐	☐
15. Compromises in conflict situations by changing own ideas to reach agreement	☐	☐	☐
16. Acknowledges compliments or praise from peers	☐	☐	☐
17. Easily makes transition from one classroom activity to another	☐	☐	☐
18. Controls temper in conflict situations with peers	☐	☐	☐
19. Finishes class assignments within time limits	☐	☐	☐
20. Listens to classmates when they present their work or ideas	☐	☐	☐
21. Appears confident in social interactions with opposite-sex peers	☐	☐	☐
22. Invites others to join in activities	☐	☐	☐
23. Controls temper in conflict situations with adults	☐	☐	☐
24. Ignores peer distractions when doing class work	☐	☐	☐
25. Stands up for peers when they have been unfairly criticized	☐	☐	☐
26. Puts work materials or school property away	☐	☐	☐
27. Appropriately tells you when he or she thinks you have treated him or her unfairly	☐	☐	☐
28. Gives compliments to members of the opposite sex	☐	☐	☐
29. Complies with your directions	☐	☐	☐
30. Responds appropriately to peer pressure	☐	☐	☐

Youth Self Report – Social Competence Scale, Academic Performance (Achenbach, 1991).

Answer Scale for Interview Questions 11-14:
- *Failing*
- *Below Average*
- *Average*
- *Above Average*
- *Child not currently taking class*

11. How well do you do at school in English or language arts?
12. How well do you do at school in history or social studies?
13. How well do you do at school in arithmetic or math?
14. How well do you do at school in science?

Woodcock-Johnson III Tests of Achievement (W-J III; Woodcock, McGrew, & Mather, 2001).
The W-J III is a protected instrument; actual items are not available to report.

Children's Depression Inventory (CDI; Kovacs, Multi-Health Systems, Inc., 1992).
The CDI is a protected instrument; actual items are not available to report.

APPENDIX B

TABLES

Table 1. *Children in Foster Care in 2014 in the United States*

Total Number of Children	415,129		Mean(Mdn) Age in Yrs		8.7(8.0)
Sex	**Percent**	**Number**	**Age**	**Percent**	**Number**
Male	52%	216,645	< 1 Year	7%	28,607
Female	48%	198,426	1 Year	8%	33,264
			2 Years	7%	29,726
Most Recent Placement Setting	**Percent**	**Number**	3 Years	6%	26,512
Pre-Adoptive Home	4%	15,554	4 Years	6%	23,719
Foster Family Home (Relative)	29%	120,334	5 Years	5%	22,714
Foster Family Home (Non-Relative)	46%	190,454	6 Years	5%	22,070
Group Home	6%	23,233	7 Years	5%	20,456
Institution	8%	32,955	8 Years	5%	18,770
Supervised Independent Living	1%	4,474	9 Years	4%	17,216
Runaway	1%	4,544	10 Years	4%	15,500
Trial Home Visit	5%	21,989	11 Years	4%	14,974
			12 Years	4%	14,983
Case Plan Goal	**Percent**	**Number**	13 Years	4%	16,651
Reunify with Parent(s) or Principal Caretaker(s)	55%	218,889	14 Years	5%	19,138
Live with Other Relative(s)	3%	12,351	15 Years	5%	22,622
Adoption	25%	99,521	16 Years	6%	26,119
Long Term Foster Care	4%	15,008	17 Years	6%	26,476
Emancipation	5%	18,934	18 Years	5%	9,561
Guardianship	4%	14,739	19 Years	1%	3,245
Case Plan Goal Not Yet Established	5%	18,408	20 Years	1%	2,386

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Table 2. *Measures for Net Vulnerability Latent Variable*

Construct	Instrument
Community Environment	Philadelphia Family Management Study, Parent Interview Schedule (Furstenberg, 1990).
Protective Factors	Resilience Factors (Runyan et al., 1997).
Relationship with Caregiver	Relationship with Caregiver (Wellborn & Connell, 1987).
Special Educational Needs of the Child	NSCAW developed

Table 3. *Measures for Net Stress Engagement Latent Variable*

Construct	Instrument
School Engagement	Drug Free Schools (DFSCA) Outcome Study Questions (US Department of Education, 1989).
Your Relationship with Student	NSCAW developed
Relationship with Peers	Loneliness and Social Dissatisfaction Questionnaire for Young Children (Asher & Wheeler, 1985).

Table 4. *Measures for Reactive Coping Methods Latent Variable*

Construct	Instrument
Adaptive Coping Strategies	Youth Self Report – Social Competence Scale, Activities (Achenbach, 1991).
Maladaptive Coping Strategies	The Self Report of Delinquency (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983). *combined with* Children's Depression Inventory (CDI; Kovacs, Multi-Health Systems, Inc., 1992).

Table 5. *Measures for Emergent Identities Latent Variable*

Construct	Instrument
Social Skills	Social Skills Rating System – Social Skills Scale, Teacher Report, Secondary School Version (SSRS; Gresham & Elliott, 1990).
Academic Performance	Youth Self Report – Social Competence Scale, Academic Performance (Achenbach, 1991).

Table 6. Measures for Academic Achievement Latent Variable – Waves 1-3

Construct	Instrument
Reading Achievement	Letter-Word Identification, Woodcock-Johnson III Tests of Achievement (W-J III; Woodcock, McGrew, & Mather, 2001)**.**
Math Achievement	Applied Problems, Woodcock-Johnson III Tests of Achievement (W-J III; Woodcock, McGrew, & Mather, 2001).

Note. Standard Scores from Wave 3, W Scores from Waves 1, 2, and 3.

Table 7.*Sample Descriptive Statistics. N=285*

	Mean	SD	Range
Age	14.09	1.86	11-17 years
Total Placements	2.64	2.20	1-11 placements
Total Days in Care	670.71	423.90	1-1547 days

	n	%		n	%
Gender			*Type of OOH Care*		
Female	147	51.6	Foster Care	128	44.9
Male	138	48.4	Kinship Care	98	34.4
			Specialized Care	3	1.1
			Group Home/RTC	49	17.2
Ethnicity/Race			Other Care	7	2.5
Black	100	35.1			
White	82	28.8	*Adolescent Cohort*		
Hispanic	69	24.2	Early (11-13)	107	38.9
Other	34	11.9	Mid (14-17)	168	61.1

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Table 8. *Variables Included in Study.*

	Mean(SD)	Skewness	Kurtosis
Caregiver Relationship	13.47(2.24)	-0.92	0.49
Community Environment	12.38(3.33)	1.53	2.73
Protective Factors	4.55(0.80)	-1.90	2.93
School Engagement	34.08(5.05)	-0.76	0.90
Peer Relationships	27.85(10.30)	1.16	1.40
Maladaptive Coping	-0.16(1.41)	1.68	3.35
Adaptive Coping	0.0031(4.05)	0.041	-0.25
Social Identity	95.15(16.18)	0.21	0.090
Academic Identity	12.21(2.08)	-0.73	1.64
Reading Achievement	92.31(14.00)	-0.31	1.40
Math Achievement	87.91(10.83)	-0.23	0.90

Table 9. *Final Factor and Indicator Structure.*

Factor	Indicator
Net Vulnerability	Protective Factors
	Caregiver Relationship
Net Stress Engagement	Peer Relationships
	School Engagement
Resilience[*]	Adaptive Coping [a]
	Maladaptive Coping [a]
	Social Identity [b]
	Academic Identity [b]
Academic Achievement	Math Achievement
	Reading Achievement

Note: [*]Resilience is a factor that represents a combination of Reactive Coping Methods and Emergent Identities. [a] Original indicators of Reactive Coping Methods. [b] Original indicators of Emergent Identities

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Table 10. *Standardized Effects to Academic Achievement.*

	Direct	Indirect	Total
Net Vulnerability	-1.40[*]	1.46[*]	0.06
Net Stress Engagement	-0.003	0.26[†]	0.26[†]
Resilience	1.59[*]	—	1.59[*]

Note. Estimates obtained via Monte Carlo bootstrapping with bias-corrected CIs. [*] $p < .001$; [†] $p < .05$

Table 11. *Tests of Invariance for Factor Structure for Early- and Mid-Adolescent Cohorts*

Model	χ^2	df	$\Delta\chi^2$	Δdf	p	RMSEA	RMSEA[*]	SRMR	CFI	AIC
1. Combined	33.74	28	-	-	.209	.033	.033	.044	.980	107.744
1a. Mid Adol	71.88	68	34.06	29	.351	.022	.022	.065	.982	145.875
1b. Early Adol[a]	-	-	-	-	-	-	-	-	-	-
2. Metric	148.44	120	114.7	92	.040	.035	.049	.091	.915	324.440

Note. Early Adolescent model does not converge. Negative error variance values present. * RMSEA corrected for the number of groups.

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APPENDIX C

FIGURES

Figure 1. Trajectory for foster youth displaying path from maltreatment to negative educational outcomes.
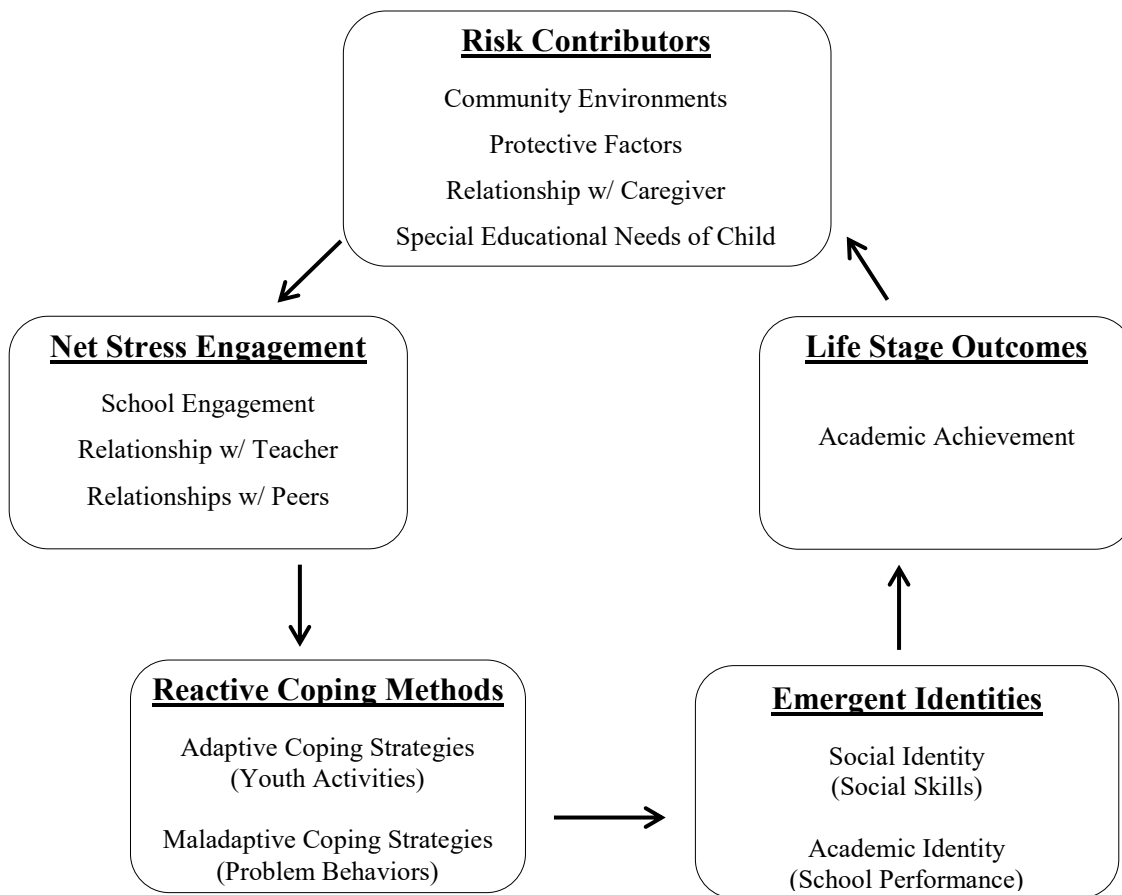

Figure 2. Phenomenological Variant of Ecological Systems Theory (PVEST, Spencer, 1995). PVEST consists of five interactive stages that demonstrate the active agency of a participant in his or her environment. The stages here display relevant factors for academic achievement of foster youth.
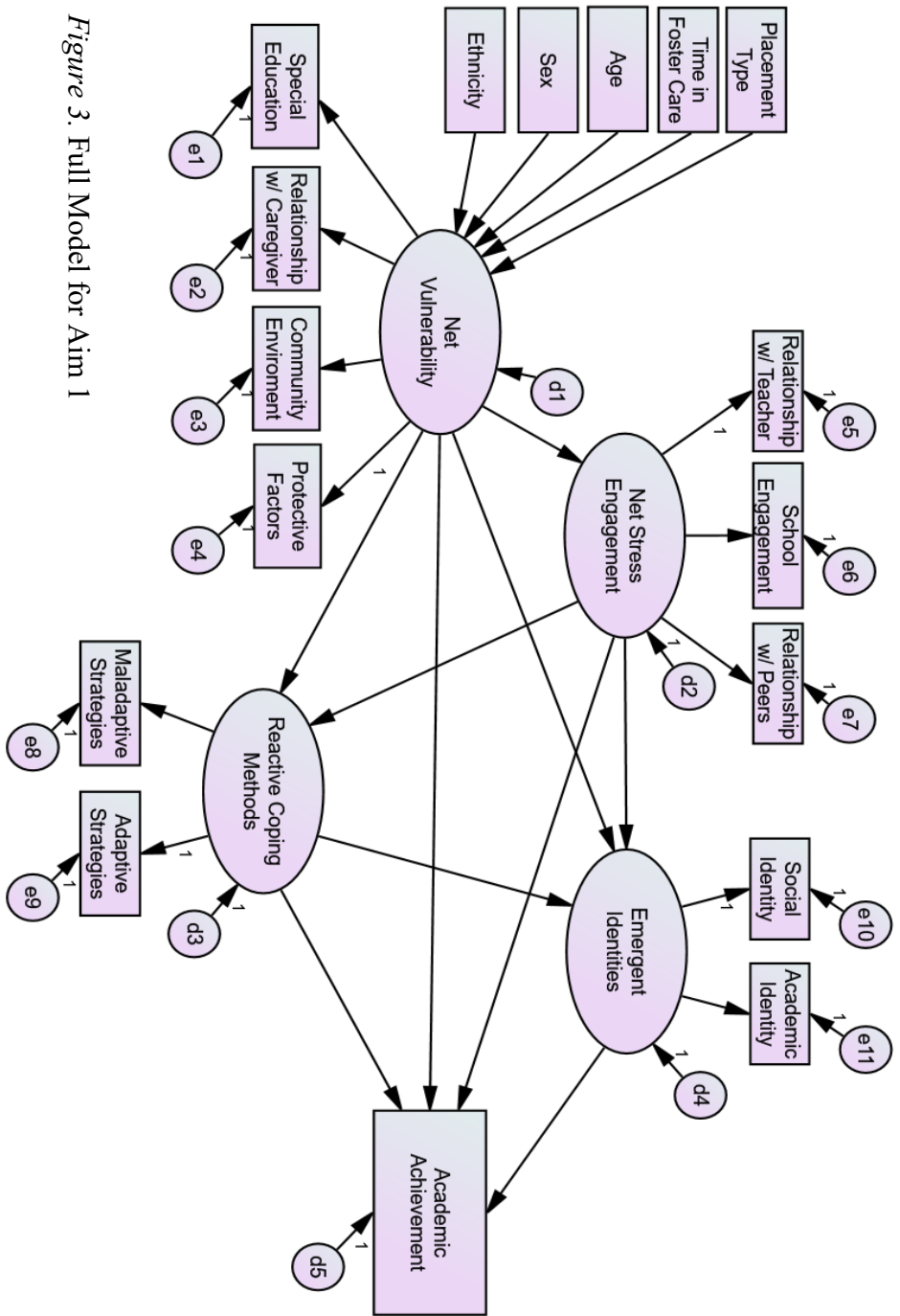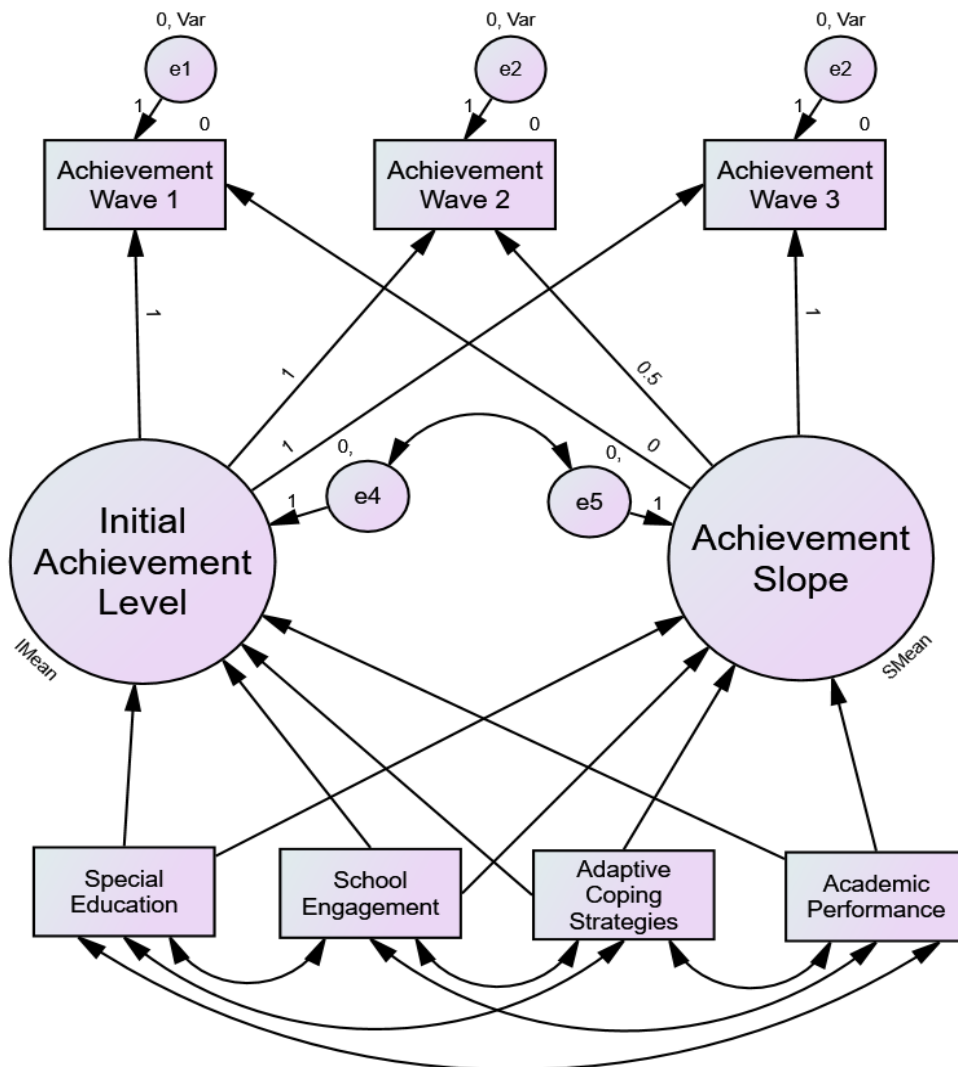
Figure 3. Full Model for Aim 1
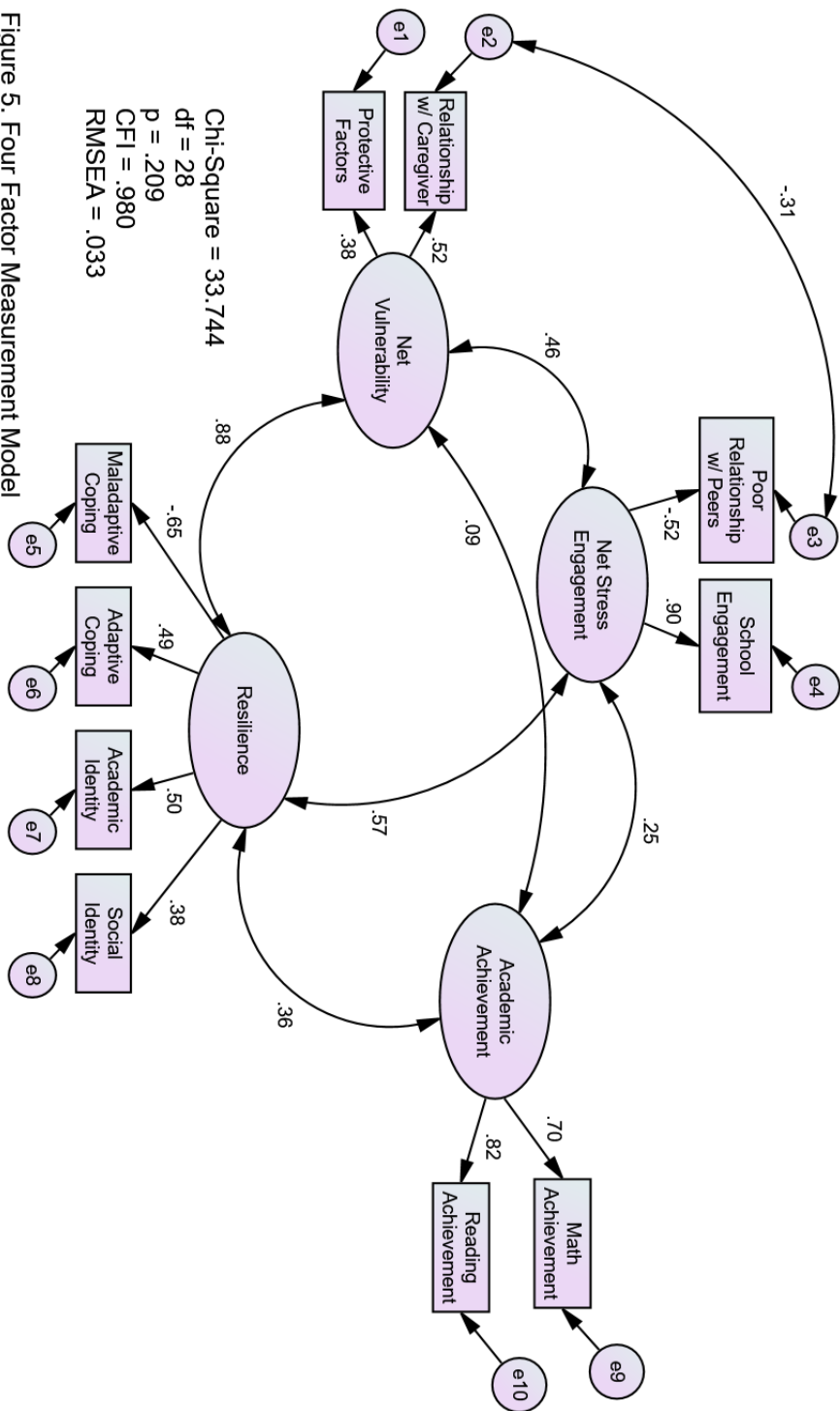
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Figure 4. Example Latent Growth Model for Aim 3

Figure 5. Four Factor Measurement Model
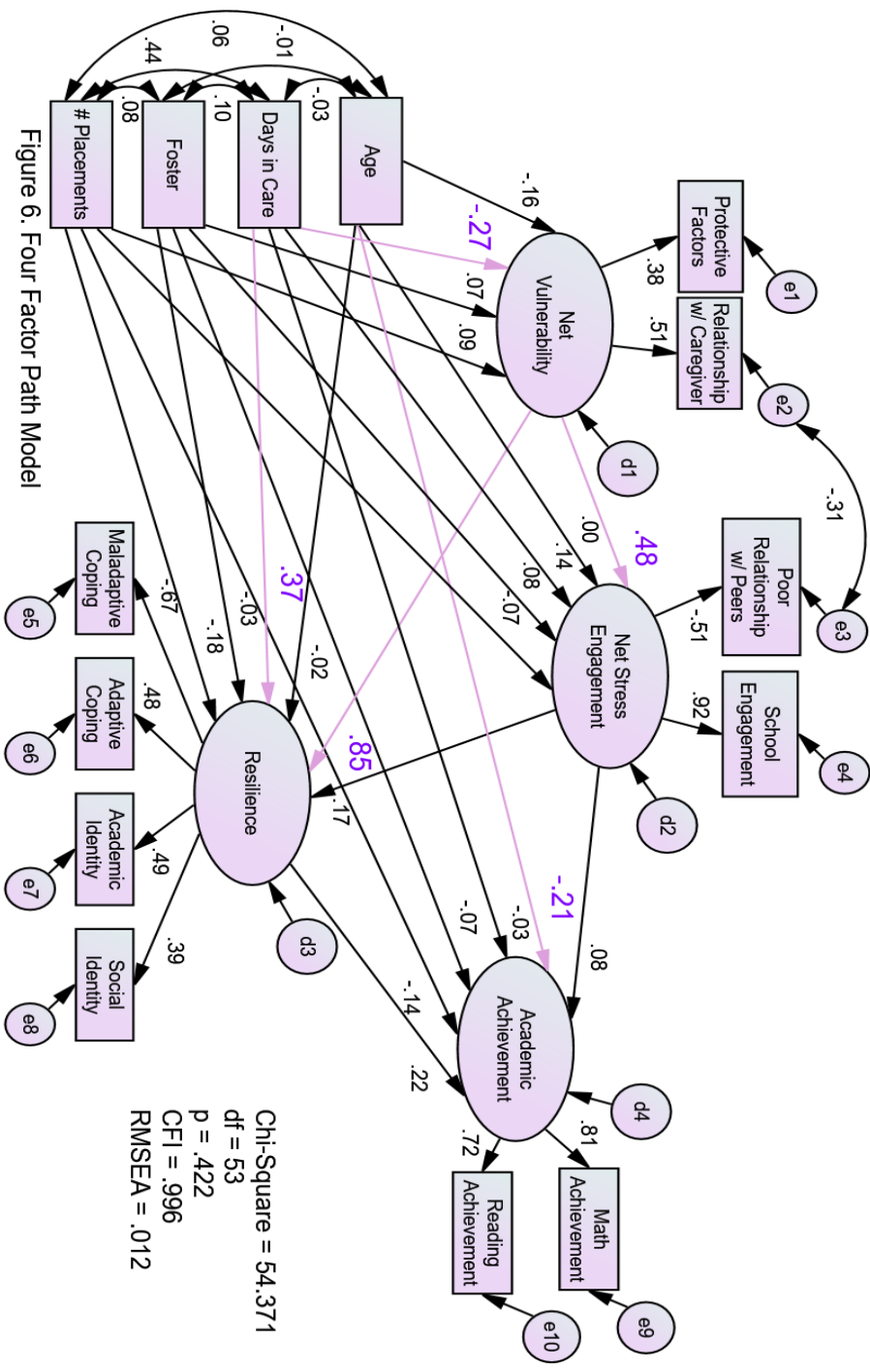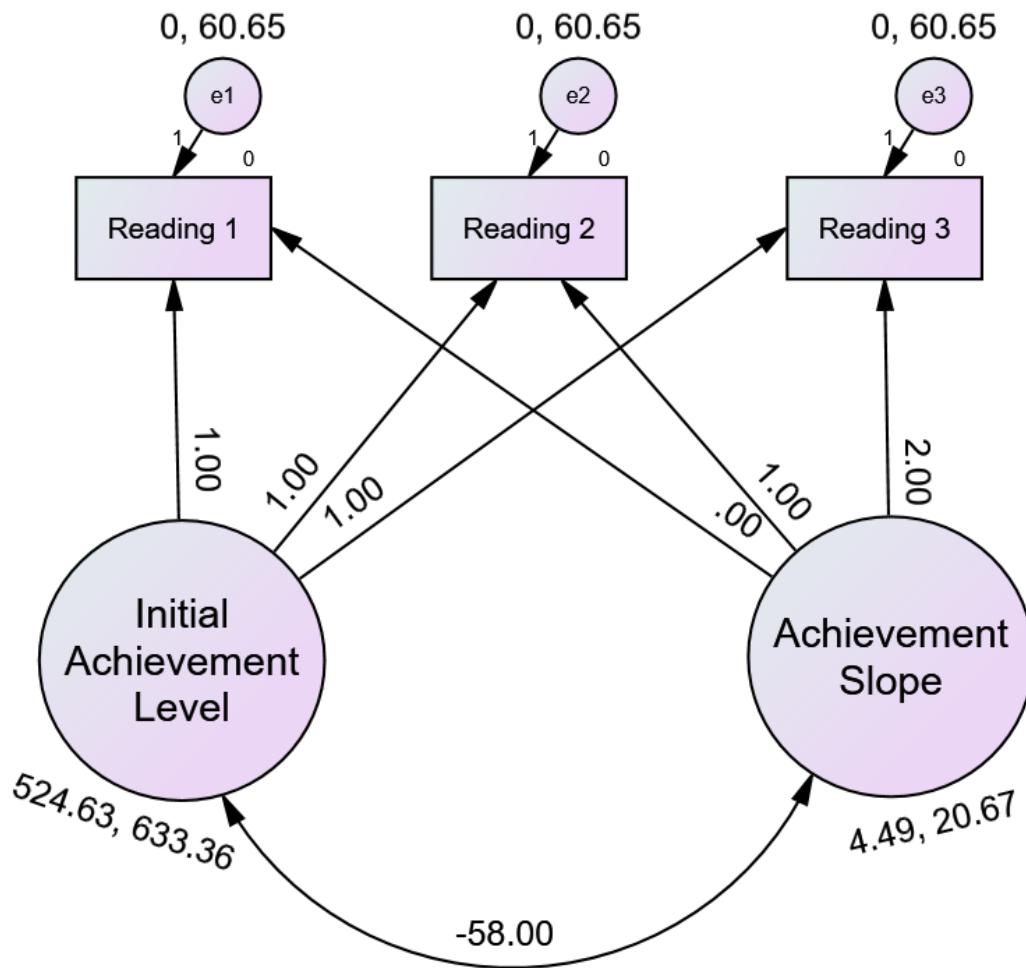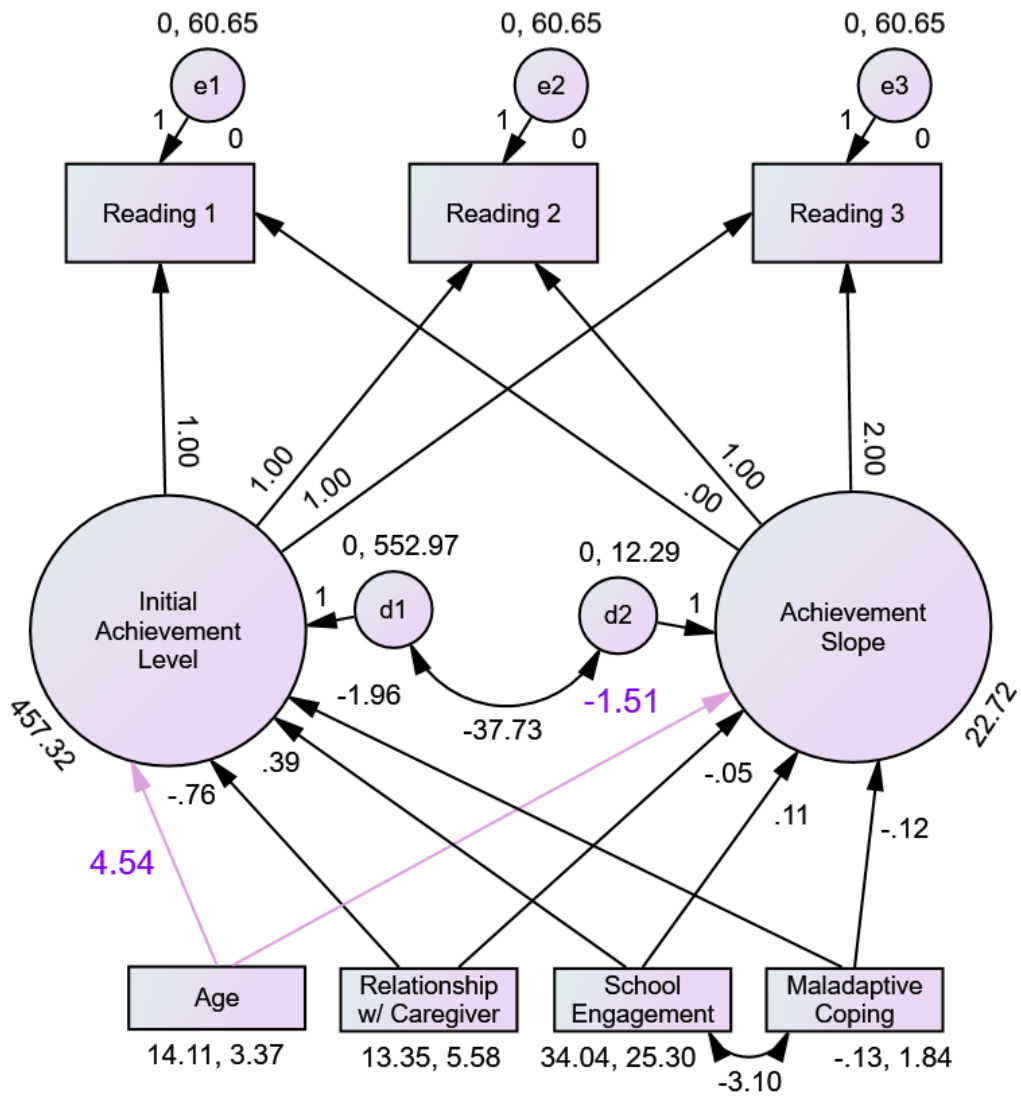
Chi-Square = 33.744
df = 28
p = .209
CFI = .980
RMSEA = .033

Figure 6. Four Factor Path Model

Chi-Square = 54.371
df = 53
p = .422
CFI = .996
RMSEA = .012

122

Figure 7. Unconditional Reading Achievement Growth Model

Figure 8. Conditional Reading Achievement Growth Model - Unstandardized

0, 12.06

0, 102.71

0, 109.93

e1

e2

e3

1   0

1   0

1   0

Math 1

Math 2

Math 3

1.00

1.00

1.00

1.00

.00

1.00

2.00

Initial Achievement Level
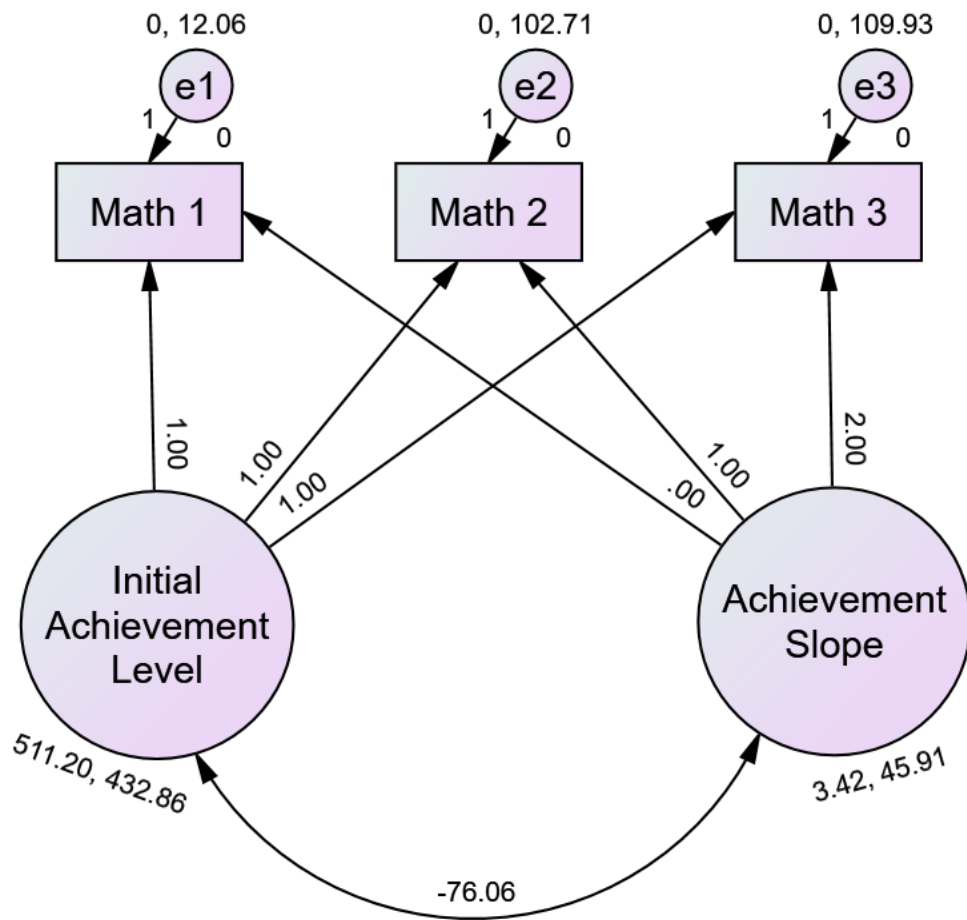
Achievement Slope

511.20, 432.86

3.42, 45.91

-76.06

Chi-Square = .098
df = 1
p = .754
CFI = 1.000
RMSEA = .000

Figure 9. Unconditional Math Achievement Growth Model
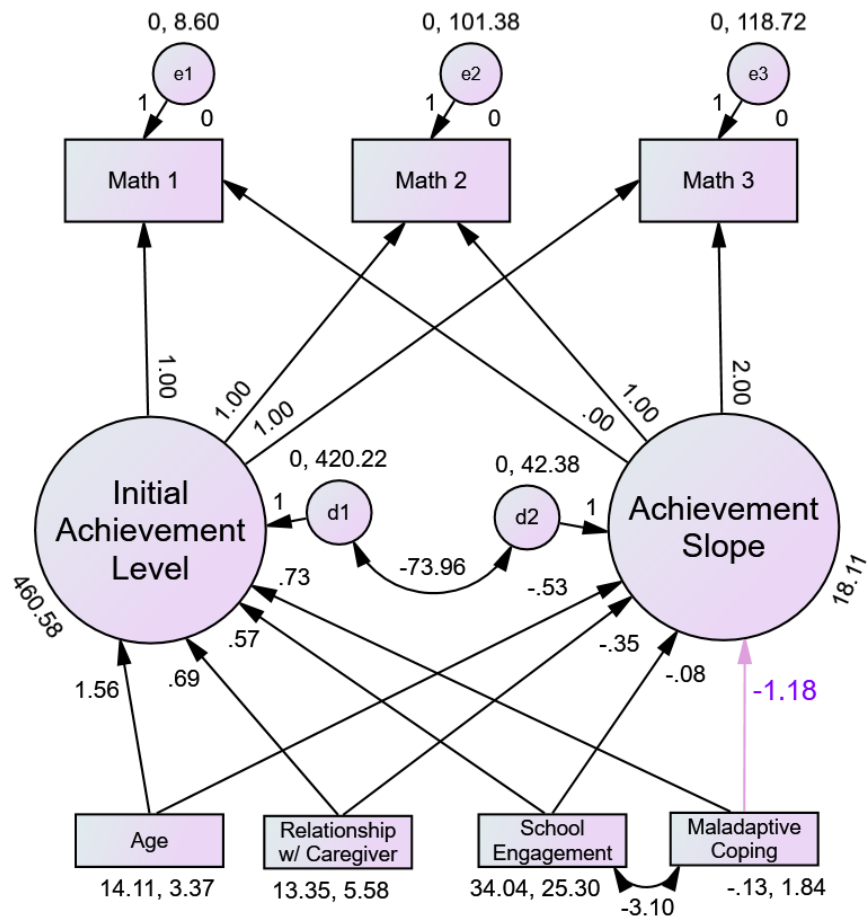
Chi-Square = 13.139
df = 10
p = .216
CFI = .990
RMSEA = .045

Figure 10. Conditional Math Achievement Growth Model - Unstandardized

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