Understanding Adverse Childhood Experiences and Adolescent Mental Health in the Context of Social Support from Caregivers, Schools, and Neighborhoods

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Approval of the Dissertation

This dissertation, "Understanding Adverse Childhood Experiences and Adolescent Mental Health in the Context of Social Support from Caregivers, Schools, and Neighborhoods", has been approved by the Graduate Faculty of the Curry School of Education and Human Development in partial fulfillment for the degree of Doctor of Philosophy.

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CHAPTER I

Statement of the Problem

Childhood adversities are various events that threaten children's physical or psychological well-being. Over the past few decades, the consequences of a subset of these adversities called, Adverse Childhood Experiences (ACEs), have become widely acknowledged across multiple disciplines, from public health to neurobiology to clinical psychology. Traditionally, ACEs consist of three overarching categories that include 10 specific types: abuse, including physical, emotional, and sexual; neglect, including physical and emotional; and household dysfunction, including divorce, domestic violence, and household members who are mentally ill, incarcerated, or abusing substances (Felitti et al., 1998). With an understanding of the detriments that ACEs have on health and mental health, it continues to be crucial to understand what can be done to alleviate these consequences. In addition to the vast work related to outcomes in adulthood, it is known that ACEs have more proximal effects on children and adolescents, making this a significant period for more focused attention.

Adolescence specifically is a critical time in development where changes occur at the level of the brain, body, and personal identity, including the onset of potential mental health issues (e.g., Lee et al., 2014; Merikangas et al., 2010). For adolescents, the incidence of internalizing disorders (e.g., anxiety and depression) is on the rise, resulting in poor functioning, hospitalizations, and suicide, demonstrating a public health crisis. In particular, adolescents who have experienced ACEs are at increased risk for developing mental health disorders (Duke & Borowsky, 2018; Moore & Ramirez, 2016; National Scientific Council on the Developing Child, 2014). Given the potential short- and long-term effects of ACEs for youth mental health, it is worth further expanding this body of work. This can be done in multiple ways: first, by better

understanding the contributions of timing, total, and high adversity of ACEs on adolescent outcomes; and second, by using a resilience framework focused on identifying protective factors (Bethell et al., 2014; Soleimanpour et al., 2017). There is evidence that social support, particularly from adults across multiple contexts, could be a key protective factor (Anderson Moore et al., 2016; Armstrong et al., 2005; Eisman et al., 2015; Ronen et al., 2016; Rueger et al., 2016; Sege et al., 2017). However, few if any studies have comprehensively addressed the mitigating role of family, school, and neighborhood social support for adolescents who have experienced ACEs. Critically analyzing this information from adolescents' own points of view, in terms of their perceptions of the support they receive and their mental health functioning, is imperative. This study investigates how adolescents' responses to ACEs, particularly with regard to their psychological functioning, differ based on the levels of supportive social relationships in their lives.

Chapter II of this proposal takes a more in-depth look into the concepts mentioned above by reviewing the literature on adolescent mental health, ACEs, resilience, and supportive social relationships. This is integrated with theoretical underpinnings that inform the inquiries of this dissertation. Chapter III describes the sample and measures that were used to address the main aims of this project. Chapter IV presents the analytical strategy and results. Finally, Chapter V provides a discussion related to relevant findings, practical implications, and limitations.

CHAPTER II

Literature Review

Adolescence as a Sensitive Period

Adolescence is a sensitive period when puberty and neural development trigger new and evolving beliefs about oneself and ways of functioning in the world. Changes at the biological level related to puberty and hormones are universal phenomena of adolescence, holding an evolutionary purpose of sexual maturity and reproduction. Due to social and cultural changes over time, this is no longer the primary purpose of adolescence in the United States. Nevertheless, puberty ultimately results in body maturation, making adolescents look and feel different than they have previously. Thus, hormonal alterations have direct downstream effects on adolescents' cognitive, emotional and behavioral systems. These multifaceted changes and challenges provide a foundation for adolescents' reactions to stress and to what extent they progress toward optimal functioning versus become at risk for developing mental health issues.

Accordingly, adolescence is considered to be a time of cognitive, emotional, and behavioral dysregulation, with much evidence to support this notion. While the development of basic self-regulatory and executive functioning skills are critical early in life, adolescence is another period when youth are faced with new challenges that call upon the engagement of these systems in ways that are more complex. Importantly, the brain develops structurally and functionally due to neurobiological and neuroendocrine transformations. Based on research with animals and human brain imaging, in adolescence there are changes in neurocircuitry, white and gray matter, the release and transmission of neurotransmitters, the connectivity between regions and activation of subcortical regions, and the overall refinement of neuronal projections (Arain et al., 2013; Casey et al., 2010; Colver & Longwell, 2013; Dahl, 2004; Konrad et al., 2013). The

immature limbic system and prefrontal cortex begin to mature through reorganization and activation shifts from diffuse to more localized activity along with a new wave of synaptic plasticity allowing for vast changes and new vulnerabilities (Arain et al., 2013; Casey et al., 2010; Colver & Longwell, 2013; Dahl, 2004; Konrad et al., 2013). Consequently, adolescents are strapped with heightened responsivity to new experiences, motivation, and socioemotional contexts, including strong emotions and sensitivity and reactivity to those emotions. At the same time, they have immature impulse control and decision-making skills and are more likely to take risks, making them more vulnerable to engaging in dangerous behaviors such as unprotected sex, drugs, alcohol, and violence (Arain et al., 2013; Casey et al., 2010; Colver & Longwell, 2013; Dahl, 2004; Konrad et al., 2013). The convergence of such factors taking place during adolescence place youth at particular risk for experiencing mental health problems.

These developmental and biological tendencies result in a myriad of responses to the internal workings of adolescents' thought processes and emotions, as well as more visible behaviors to the external world. Key developmental theorists laid the groundwork for the processes by which adolescents are now challenged to examine their identity; who they are, who they want to be, and what that means for how they will interact with those around them (Erikson, 1964, 1968; Marcia, 1966, 1980). Due to these transformations, adolescence can be confusing and overwhelming, making it a potentially unsettling period. Many times, this exploration takes a toll on individuals' self-esteem and self-concept. Developmental considerations, combined with potential genetic vulnerabilities and additional life stressors, should put adolescents on high alert for influences on their mental health.

Mental illness prevalence in adolescence. Mental illness is reported to be the most prevalent chronic health condition experienced by youth with prevalence rates higher than

common medical diagnoses such as asthma or diabetes (Melchert, 2015). It has been projected that most mental health disorders begin before adulthood. However, due to a variety of factors, many adolescents with mental illness go undiagnosed and even more frequently go untreated (Costello et al., 2014). While statistics vary, it is estimated that anywhere from 40 to 60 percent of adolescents with mental illness are untreated (Copeland et al., 2015; Mental Health America, 2015). Another estimate reports that while 49.5% of children and adolescents have a diagnosable disorder, only 7.4% have any mental health visit in a year (Child Mind Institute, 2015). Even when treatment is sought, there is often a years-long delay from symptom onset to intervention (National Alliance on Mental Illness, 2019). If not treated in adolescence, a recent study showed that it is even more unlikely for young adults to receive treatment (Costello et al., 2014).

Both in research and in practice, mental health professionals typically categorize youths' behaviors and symptoms as either internalizing or externalizing. The American Psychological Association (APA) defines internalizing behaviors and disorders as "characterized primarily by processes within the self, such as anxiety, somatization, and depression" with symptoms such as being fearful, shy, anxious, and inhibited. In contrast, externalizing behaviors and disorders are "characterized primarily by actions in the external world, such as acting out, antisocial behavior, hostility, and aggression" with symptoms such as aggressive, antisocial or undercontrolled behavior (American Psychological Association, 2018). Well-validated and frequently used rating scales of child and adolescent functioning (i.e., Child Behavior Checklist [CBCL]; Behavior Assessment Scoring System [BASC]) include composites in these domains. Adolescents (ages 12-17) in particular are at increased risk of having an internalizing disorder such as anxiety and/or depression (Ghandour et al., 2019). In a study using a nationally representative sample of adolescents (ages 13-18) in the U.S. from 2001 to 2004, it was estimated that 49.5% of

adolescents had a lifetime prevalence of any mental illness (Merikangas et al., 2010). Anxiety disorders were the most common at 31.9%. Common symptoms of anxiety disorders include excessive fear, worry, and related behavioral disturbances such as hypervigilance and avoidance. Those with anxiety may experience muscle tension, restlessness, or irritability (American Psychiatric Association, 2013). While mood disorders (including depression) were the third most common at 14.3% after behavior disorders (19.1%), they represented the highest prevalence of having severe impairment compared to both anxiety and behavior disorders (Merikangas et al., 2010). Depression includes symptoms such as depressed mood (e.g., sad, empty, hopeless), irritable mood, diminished interest in activities, sleep problems, fatigue, worthlessness, and difficulty concentrating (American Psychiatric Association, 2013). People who are depressed may also have thoughts of death or dying, suicidal ideation with or without a plan, and/or an actual suicide attempt. While the average age of onset for anxiety disorders tends to be in childhood, depressive disorders are more likely to begin in adolescence (Mental Health America, 2015).

Not only is mental illness – specifically, anxiety and depression – common among children and adolescents, but also trends show that mental health severities and associated functional difficulties have increased over time. From 1996 through 2007, inpatient hospitalizations of children/adolescents with psychiatric diagnoses significantly increased by 81%, compared to an 8% increase for adults (Blader, 2011). In addition, as of the 2017 census, suicide is the 2nd leading cause of death in children and adolescents between the ages of 10 and 24 (Centers for Disease Control and Prevention, 2019). A nationally representative survey of adolescents in high school found that in the previous 12 months, 15.7% reported having seriously considered attempting suicide, 12.8% reported having made a suicide plan, 7.8% reported

attempting suicide at least once, and 2.4% reported attempting suicide that required medical attention (Schiller et al., 2012).

Importantly, links also exist between the stability of health and mental health from adolescence to adulthood, though specific reports vary. Some numbers suggest that at least half of adults with mental disorders had symptoms beginning in adolescence (Jones, 2013) and that one in five adolescents are likely to have mental disorders that persist into adulthood (Lee et al., 2014). A recent systematic review reported that depression in adolescence was associated with increased risk of depression, anxiety, and suicidality in adulthood (Johnson et al., 2018). Across studies, the strongest evidence emerged for nearly three times greater odds of experiencing depression in adulthood after first experiencing the disorder in adolescence (Johnson et al., 2018). While mental illness comes at a personal cost, it also has larger societal and economic implications. It is estimated that the United States loses $202 billion in gross national product (GNP) due to mental illness in adolescents and young adults, and those with disorders are at increased risk for incarceration as adults (Child Mind Institute, 2015). Despite mounting evidence that mental illness in adolescence is a pressing public health issue, the topic remains immensely stigmatized and warrants more public attention than it is given (Corrigan, 2004; Kaushik et al., 2016; Mukolo et al., 2010). Experts in adolescent brain development indicate that "[d]espite the moral imperative and long-term economic benefit of improved diagnosis and treatment of mental disorders in adolescence, there has not been commensurate investment in research to bring them about" (Lee et al., 2014). Efforts to increase understanding, prevention, and treatment of mental illness in adolescence is crucial in limiting distress and setting youth up for healthy and successful futures. Where can intervention efforts be focused to limit the number

of adolescents being admitted to hospitals and/or dying from severe mental illness? One place to begin is by understanding factors that may contribute to adolescents' risk and resilience.

Theoretical and Conceptual Framework

In this section, two theories providing a broad contextual framework are laid out that in combination help to more comprehensively understand youth mental health and the reciprocal impacts of the social world. Theoretical evidence is provided to suggest that it is critical to examine both risk (ACEs) and protective factors (social support) in order to understand resilience and optimal mental health functioning in adolescents. These theories are used to guide this dissertation work and the information in the sections to follow.

Biopsychosocial model. As discussed, adolescents are amid transformative life changes and maturation in self-concept/identity, along with social, emotional, and behavioral functioning. Acknowledged in the literature since the 1970s, George Engel's biopsychosocial model (Engel, 1977) remains a widely accepted and leading theory of understanding factors that explain human functioning and, more specifically, mental health. A related but distinct model of human development worth mentioning regarding the importance of various environments surrounding a child is that of Bronfenbrenner's ecological systems (Bronfenbrenner, 1979, 1983). Melchert (2015) writes that, "a scientific approach to understanding human psychology requires a comprehensive systemic framework that fundamentally recognizes the interactions between the biological, psychological, and sociocultural levels of natural organization" (p. 16). As the name implies, contexts relevant to biology (e.g., genes, brain chemistry), psychology (e.g., coping, stress), and social-environmental (e.g., family, peers) intersect and overlap in multi-directional ways. The *Handbook of Adolescent Development* states that "[s]cholars of adolescent development have accepted the importance of the integration of biological, psychological, and

contextual processes long before it was fashionable in other areas of developmental science" (Lerner & Steinberg, 2004, p. 36).

As such, all of these areas evolve in distinct ways for adolescents' well-being, but the social context has many times shown itself to be highly influential for children and adolescents at risk of developing mental health concerns. Taking the stance that adolescents' mental health is inextricably linked with the social experiences in their lives makes us consider a more specific theory.

Social determinants of health. The social determinants of health theory connects social advantage or disadvantage to both positive and negative health outcomes and brings multiple elements of context into consideration (e.g., family background, education, life events). There is little debate that, in general, supportive relationships have positive impacts on youth. At the core, humans are social beings and connection and belonging are pre-requisites for a happy and fulfilling life. Thus, without these elements, everyone is at risk of a host of difficulties, and in their presence, can be resilient in the face of adversity. The social determinants of health are defined by the World Health Organization as "the conditions in which people are born, grow, live, work, and age" (WHO Commission on Social Determinants of Health & World Health Organization, 2008). Viner and colleagues (2012) add that this includes "conditions or circumstances that are shaped by families and communities and by the distribution of money, power, and resources at worldwide, national, and local levels, and affected by policy choices at each of these levels" (p. 1641). More specifically, they include a specific category of "proximal" determinants that include aspects related to the daily life and contexts of youth. Other researchers define the social determinants of health as "any nonmedical factor directly influencing health," which they go on to say includes factors such as family, neighborhood, and social network

contexts (Notterman & Mitchell, 2015). The current study focuses on social relationships in adolescents' most proximal settings, within their families, schools, and neighborhoods.

A great deal of work has emerged that speaks to both the risk and protective factors associated with social disadvantage and advantage in childhood, details of which will be discussed later. It has been hypothesized that effects are already visible in childhood but become more entrenched with age (Notterman & Mitchell, 2015). A recent review of the social determinants of health literature revealed strong evidence of the social factors across multiple levels that impact adolescent outcomes (i.e., mortality, sexual health, health behaviors, mental health; Viner et al., 2012). In particular, this review concluded that "safe and supportive families, safe and supportive schools, together with positive and supportive peers are crucial in helping young people develop to their full potential and attain the best health" (Viner et al., 2012; p. 1641).

When working from the lens of the biopsychosocial model and considering the social determinants of health, adolescent mental health may be best understood by focusing on youth who are already at heightened risk due to adverse experiences in their social environment. One way to study this is through an explicit examination of the potentially traumatic interpersonal experiences to which youth may be exposed. There is then an opening to take a strengths-based approach by considering and identifying protective factors related to social support that promote resiliency for these youth in the face of adversity.

Adverse Childhood Experiences (ACEs)

A wide range of stressful events during childhood has the potential to disrupt a child's life and development in numerous and complex ways. Cumulative risk theory posits that the accumulation of multiple risk factors in childhood is likely to result in poor psychological

outcomes and that more risk factors equate to more negative outcomes (Rutter, 1979). One way to inquire about and measure cumulative risk is through ACEs, with much of the literature now addressing these concepts hand in hand. As a reminder, ACEs consist of various aspects of child maltreatment (i.e., abuse and neglect) and household dysfunction (e.g., domestic violence, mental illness). The research and impact regarding ACEs is widely accepted, has elicited interdisciplinary attention, and is referenced as a public health crisis (Sacks & Murphey, 2018). Data from the National Survey of Children's Health (NSCH) conducted in 2016 indicate that 45% of children in the United States have experienced at least one ACE (Sacks & Murphey, 2018). Additionally, one in 10 children in the U.S. has experienced three or more ACEs, putting them at high risk for negative outcomes.

Outcomes in adulthood. Original interest in the concept of ACEs was sparked by early work asking adults to retrospectively consider ACEs. Linkages emerged between ACEs and increased health and mental health problems in adulthood, including increased risk for disease and early death. This early ACEs research began with a groundbreaking study by Felitti and colleagues (1998) in conjunction with Kaiser Permanente's Department of Preventive Medicine and the Centers for Disease Control and Prevention, in which ACE scores were calculated for 17,000 adult participants. They remarked on the association between exposure to 10 instances of maltreatment or household dysfunction in childhood – emotional, physical, sexual abuse, emotional or physical neglect, separation/divorce, being in a household where someone was abusing substances, mentally ill or suicidal, imprisoned, or where the mother was treated violently – and risk of disease in adulthood (Felitti et al., 1998). Only 33% of respondents reported no ACEs, whereas 26% reported one, 16% reported two, 10% reported three, and 17% reported four or more.

Specifically, they found that participants reporting more ACEs also had a greater chance of presenting with heart, lung, liver disease and cancer. Those who reported four or more ACEs compared to none had a significant increase in risk for problems such as depression, suicide attempts, smoking, alcoholism, drug abuse, sexually transmitted diseases, and obesity. Overall, results suggested that not only were ACEs more commonly experienced than what had ever been reported in the literature, but the implications of this exposure in childhood were cumulative and destructive in adulthood. A large body of continued research examining the significance of ACEs across numerous outcomes and ages has followed this inaugural work along with multiple technical reports and policy statements from organizations such as the American Academy of Pediatrics (Garner & Shonkoff, 2012; Shonkoff et al., 2012).

Outcomes in childhood and adolescence. With the ACE landscape in place, current literature has shifted to looking at outcomes closer to when ACEs occur and the proximal impacts of these experiences. The potential consequences of persistent childhood adversity, such as ACEs, are frequently talked about as resulting from toxic stress. Toxic stress is a prolonged activation of the body's stress response system, including hormones such as cortisol (Shonkoff et al., 2012). Toxic stress disrupts and changes the developing brain and bodily functions resulting in the potential for long lasting damages and prolonged outcomes on behavior, health, and mental health. It is hypothesized to result in downstream effects of social, emotional, and cognitive impairment, adoption of health-risk behaviors, and finally disease, disability, and death (Shonkoff et al., 2012). A critical characteristic of toxic stress is the absence of a supportive adult relationship that in other cases may buffer the response to stress. In an effort to reduce the consequences of adversity, understanding and combating experiences that might increase the likelihood of toxic stress has become a focus. As such, numerous influential organizations have

released statements regarding the importance of studying, understanding, measuring, and combating toxic stress (Garner & Shonkoff, 2012; National Scientific Council on the Developing Child, 2014; Shonkoff et al., 2012).

There is no doubt that these biological underpinnings begin to have proximal effects and are the basis for difficulties within the social, emotional, and behavioral domains in childhood and adolescence. More recently, studies have begun to confirm the negative consequences and maladjustment during childhood and adolescence that comes with experiencing ACEs (Flaherty et al., 2013; Hughes et al., 2017; Jimenez et al., 2016; Kerker et al., 2015). For example, experiencing ACEs increases children's and adolescents' risk for attentional, social, and behavioral problems; chronic medical conditions; and other health problems (Flaherty et al., 2013; Hughes et al., 2017; Jimenez et al., 2016; Kerker et al., 2015). Notably, there are still only a handful of large, nationally representative studies looking at outcomes in adolescence specifically (Balistreri & Alvira-Hammond, 2016; Duke & Borowsky, 2018; Moore & Ramirez, 2016).

In a population-based study with 126,868 adolescents (mean age of 14.8 years), ACEs were associated with poor self-rated health indicators including but not limited to BMI, sleep, and physical activity (Duke & Borowsky, 2018). The authors described these health behaviors as patterns beginning in adolescence that are linked to later adult health outcomes. Using their results, they called for primary care models that include screening, identifying, and intervening around ACES for youth and families. As this study suggests, the key to preventing the unfavorable consequences of ACEs in adulthood revolves around intervening earlier. Just as toxic stress affects physical health, it can affect mental health, yet no study has taken a comprehensive look at linking ACEs to mental health outcomes in adolescence. Additionally, the

sample above was largely white/non-Hispanic (69.2%), with 28.5% receiving free or reduced-price lunch and only 4.6% reporting food insecurity. They also report that their measures did not allow for the determination of the length of exposure to ACEs, limiting the ability to speak to the impact of consistency.

Moore & Ramirez (2016) found that more ACEs predicted lower adolescent well-being using a large nationally representative sample of 12- to 17-year-olds. They also found that the presence of safe neighborhoods and schools as well as parental monitoring of friends and activities lessened the negative impact of ACEs and promoted better well-being. They concluded that there is value in assessing for ACEs alongside protective factors in adolescence due to the importance of intervention timing. They also suggest that future research should include additional protective factors related to school, as well as longitudinal analyses, and an assessment of the duration of ACEs.

Another study attempted to capture a proxy for mental health functioning in adolescence using the same nationally representative sample as Moore & Ramirez (2016). A relationship was found between ACEs and poor adolescent health and emotional well-being (Balistreri & Alvira-Hammond, 2016). While only using parent report, findings also showed a buffering effect of family functioning that supported more optimal health and reduced emotional problems. The authors suggest pursuing additional understanding around what aspects of family functioning matter most and whether this varies based on duration of adversity. They further stress the need for research investigating the timing of adversity related to adolescent health and mental health by use of longitudinal data.

Several studies have explored ACEs within the same longitudinal study of a nationally representative, birth cohort sample from the *Fragile Families and Child Wellbeing* (FFCWB)

study. This rich longitudinal dataset includes time points at birth and years 1, 3, 5, 9, and most recently, 15. Of this work, notable findings include the following: having more than three ACEs at year 5 was related to below average teacher-reported academic and behavioral problems at the end of Kindergarten (Jimenez et al., 2016); ACE exposure between birth and year 5 was related to an increased presence of parent-reported internalizing and externalizing behaviors at year 9 (Hunt et al., 2017); and ACEs between years 5 and 9 were associated with increased likelihood of a parent-reported ADHD diagnosis at year 9 (Jimenez et al., 2017). Others have used the FFCWB dataset to explore the predictive role of infant health conditions at birth and neighborhood disorder at year 3 and ACEs at year 5 (Reichman et al., 2018; X. Wang & Maguire-Jack, 2018). This dissertation uses this same FFCWB data set to extend previous findings. With the exception of one study to be discussed later (Schroeder et al., 2018), all of this work still uses ACEs measured at only one time point, relies solely on parent or teacher report, and does not go past middle childhood.

Collectively, the studies mentioned previously emphasize gaps in the research allowing for additional methods and measurement of ACEs as a way to further explore potential impacts on adolescent outcomes. The current dissertation aims to address limitations in the broader field of ACEs, as well as to expand on studies using the FFCWD data set specifically. Of note, the literature suggests that work using longitudinal data to address impact across time, focusing on outcomes in adolescence, and further emphasizing protective factors is warranted; all of these limitations are addressed in this new work.

Timing and measurement. While the original ACE study (Felitti et al., 1998) asked about 10 specific adversities, there is no single, agreed-upon list of ACEs and many studies make idiosyncratic decisions about what to include. However, certain experiences such as

psychological, physical, and sexual abuse; neglect; domestic violence; and family mental illness are often captured across all assessments. ACEs are now also expanding to include adversities such as poverty, foster care, bullying, and discrimination (C. D. Bethell et al., 2017; Dym Bartlett, 2019; Finkelhor, 2018). Research has shown that the accumulation and cumulative effect of ACEs (rather than a particular ACE) is the strongest predictor of negative outcomes (C. D. Bethell et al., 2017; Björkenstam et al., 2013; Chartier et al., 2010). ACEs-related risk is typically characterized by a total sum ACE score, where more than three or four is considered "high risk." Thus, even with the qualitative distinctions between types of ACEs, research supports the idea that the specific ACEs chosen are less important than understanding the overall exposure to adversity. Although individual ACEs are generally summed, this is typically only done at one time point. It is rare to find work measuring ACEs across time. When attempting to understand outcomes related to possible toxic stress responses, measuring ACEs longitudinally seems particularly relevant. There has been a call for more research on how ACEs affect adolescents differentially based on experiences from different developmental periods, including early and middle childhood as well as adolescence (Soleimanpour et al., 2017). The significance of adversity in early childhood (birth to five) has been suggested and verified (Andersen et al., 2008; Center on the Developing Child, 2007; Luby et al., 2017). Now, given what is known about the changes in adolescence and potential added detriment of toxic stress, it is imperative that the impact of ACEs during this key developmental period is examined (Flaherty et al., 2013).

From the limited work that has been done on the timing of ACEs, findings are mixed. There is evidence that psychosocial adversity in the preschool time period predicted health problems through early adolescence (Whalen et al., 2016). Other work has shown that

experiencing child maltreatment between the ages of 4-9 is related to increased dissociative and depressive symptoms in adulthood (Schalinski et al., 2016). Similarly, ACEs between the ages of 3-7 were related to increased risk for depressive symptoms in adolescence by way of altered neurodevelopmental pathways (Luby et al., 2017). All of these studies highlight adversity relatively early in life having a strong link to later outcomes. In comparison, when ACEs were assessed longitudinally over seven time points, children with profiles of chronic ACEs across time had increased self-reported health concerns in late adolescence. Here, early childhood ACEs did not account for later problems but rather consistency was key (Thompson et al., 2015). When looking at ACEs across three developmental periods in relation to adolescent health problems at age 14, ACEs between 0-6 years were an inconsistent predictor and ACEs between 6-12 years showed little effect (Flaherty et al., 2013). However, the most recent ACEs, measured between 13-14 years, had strong relationships to poor health outcomes at 14 years and the overall or cumulative exposure of ACEs across all of childhood was also associated with negative health consequences (Flaherty et al., 2013).

Another study using the FFCWB data set also began to look at the accumulation, timing, and duration of ACEs (Schroeder et al., 2018). This study used multiple ACE scores from years 1, 3, 5, and 9 and created two summary ACE scores to capture accumulation (a sum of years 1, 3, and 5) and timing/duration (profiles from years 1, 3, and 5). The profiles consisted of high early adversity, high late adversity, intermittent high adversity, and chronic high adversity. The study examined the relationships among these various ways of measuring ACEs and parented-reported internalizing and externalizing behaviors at year 9. They found that high early, high late, and chronic adversity were related to increased odds of behavior problems, but after controlling for year 5 behavior problems chronic adversity was no longer significant. Contrary to their

hypotheses that high early and chronic adversity would be associated with the highest odds of children's behavior problems, intermittent adversity showed the strongest relationship, suggesting that unpredictability and readjustment is more disruptive to children's behavior. The current dissertation builds on and expands this investigation of the role of accumulation and duration of ACEs across time.

Additional work is needed to further understand questions related to the role of the timing and duration of ACEs as a way of identifying when prevention and intervention efforts may be most powerful. This will help to elucidate pathways between ACEs and both distal and proximal mental health outcomes in adolescence. Experts suggest that the systems affected negatively by adversity and toxic stress have the potential to be "reprogrammed" (Masten, 2019; McEwen, Gray, & Nasca, 2014). By focusing on contexts that have known connections with positive outcomes, we are closer to having a direct impact on improving adolescents lives and preventing derailment. Therefore, there is a need to determine more specifically what kinds of relational contexts and supports may increase resilience and alleviate poor mental health outcomes in the face of adversity. This will help to better understand what might serve best as targets for intervention, a question that continues to be asked (Bethell et al., 2017; Finkelhor, 2018).

Resiliency-Promoting Social Support in the Face of Adversity

Experts have defined resilience as the achievement of positive adaptation and favorable outcomes in the presence of serious threats to development (Armstrong, Birnie-Lefcovitch, & Ungar, 2005; Masten, 2001; Rutter, 1990). Protective factors are a pathway to resilience and can be thought of as "influences that modify, ameliorate, or alter a person's response to stressors" (Smith & Carlson, 1997). By taking a strengths-based approach, we can begin to explore what

counters the effects of stressors and ameliorates the relationship between risk and negative outcomes. The following quote from Melchert (2015) speaks to that notion:

> Although individuals' problems, disorders, and vulnerabilities obviously require the attention of health care providers, their strengths and resources have a critical impact on their development and functioning as well. Indeed, people's strengths often appear to have a greater impact on their overall well-being than their disorders and weaknesses. Gaining a complete understanding of people's needs and functioning consequently requires consideration of their psychological functioning, strengths, resources, and well-being in addition to their problems, disorders, and vulnerabilities" (p. 108–109).

A well-known resilience researcher described how resilience research takes a more comprehensive approach by including both protective and risk factors with a focus on both health and illness (Masten, 2019). She also states that this body of work can be used to guide and inform targets and timing of intervention models that have a particular aim to mitigate risk and promote positive development. Within the broader field of psychology, there continues to be a focus on the importance of studying the processes in which children flourish, build resilience, and optimize well-being (Anderson Moore et al., 2016). Even further, there is specific support for the notion of building resilience in the face of ACEs (C. D. Bethell et al., 2014). A review article on the use of screening for ACEs highlighted that additional research should focus on the best interventions for adolescents specifically (Soleimanpour et al., 2017). To this end, it is reasonable to focus efforts on making sure there is first a clear understanding of which protective factors to target. While resilience is often thought about from intra-individual perspective, this fails to acknowledge broader contexts and social determinants of health perspective. There is a movement toward understanding the connectedness of systems in which individuals are

embedded (e.g., families, schools, communities). Thus, we must continue to ask how the interactions of these systems work to support the adaptive capacities of the individuals within them (Masten, 2019; Southwick et al., 2016). Consistently, literature substantiates the idea that supportive relationships at multiple levels are key factors in building children's resilience (Armstrong et al., 2005; Foster et al., 2017; Ronen et al., 2016; Rueger et al., 2016; Sege et al., 2017). Leaders such as Masten (2019) have commented on how "much of human resilience is embedded in relationships and social support" (p. 101). Specifically, Masten (2004) reminds us that, "the transition[s] into and out of adolescence are likely hot spots for observing onset or offset of psychopathology, and also periods when changes in vulnerabilities and opportunities may arise and redirect the course of development." (p. 311). As such, with the increased risk of internalizing disorders and suicidality among adolescents in recent years, this is a critical time for close, strong relationships to develop across multiple contexts.

Multiple theoretical contexts provide broad yet fundamental support for the importance of relationships. This includes work by Baumeister & Leary (Baumeister & Leary, 1995) suggesting a "belongingness hypothesis" where humans are naturally driven toward meaningful interpersonal relationships and its connection to cognitions, emotions, behaviors, health, and well-being. Similarly, self-determination theory (Ryan & Deci, 2000) also posits the need for meaningful and supportive relationships as foundational to optimal human motivation and development. Other work mirrors these ideas by recounting negative impacts from lack of social support and relationships including work on loneliness (Hawkley & Cacioppo, 2010).

Even further, there is a "shortlist" of commonly observed protective factors in children, including but not limited to caring and nurturing families, other close relationships, emotional security, belonging, positive view of the self, engagement in a well-functioning school, and

connections with well-functioning communities (Masten & Barnes, 2018). This work has elucidated that broad regulatory processes include attachments to adults who monitor and support youth effectively and bonding to prosocial socializing and community organizations (Masten, 2004). The following have also shown links to improved functioning in adolescence, specifically one or more effective parents, connections to other non-parental competent and caring adults, positive self-perceptions of self-efficacy and self-worth, beliefs that life has meaning, hopefulness, effective schools and communities (Masten, 2004). With the emphasis on the significance of families, schools, and neighborhoods, these factors are worth continued examination given inconsistent and incomplete findings around what contributions relationships in these contexts could make to optimize at-risk adolescents' mental health.

A recent report reviewed research from population based data using the 2011-2012 National Survey of Children's Health Items (Sege et al., 2017). They cited profound effects when children who experienced adversity had parents who discussed important topics and participated in activities with them and were in protective home, school and neighborhood environments. The presence of these factors aided in children's resilience. They concluded that "[a]ll together, we are now beginning to appreciate the power of positive relationships and experience on human brain development and function" (Sege et al., 2017, p. 23). They went on to establish recommendations, including but not limited to developing a common set of positive experiences, enabling implementation of best practices, and establishing policies to aid in this endeavor. Thus, by thinking about how to promote better mental health outcomes in adolescence and in keeping with the literature on the social determinants of heath, it is necessary to take a look at how supportive relationships and connectedness may act as buffers for at-risk children. As another example, a study sought to examine whether adolescents perceptions of social

support would moderate the link between familial crisis and self-reported well-being (Ronen et al., 2016). Findings suggested that social support predicted well-being but did not lessen the risk from familial crisis. Rather, self-control lessened the risk which the authors suggested was linked to the benefits of social support allowing for adolescents to better utilize their self-control systems. Additionally, a meta-analysis using hundreds of eligible studies examined how social support related to depression in children and adolescents (Rueger et al., 2016). They remarked that social support plays multiple roles: 1) promoting general positive benefits and 2) serving as a stress-buffer, whereby social support offers protection from the negative effects of stress (i.e., illness, abuse, discrimination related to being a sexual minority). Their findings suggest that there is support for the role of families and teachers but less conclusive evidence related to peers. The authors recommend that future research focus on at-risk populations experiencing chronic stressors and models using multiple time points, which the current study will begin to examine. In another comprehensive approach, connectedness was examined across multiple domains including family, school, peer, and community (Foster et al., 2017). They found that youth who reported feeling more connected to their parents and schools were more likely to endorse lower levels of depression and suicidal ideation and higher self-esteem. When reporting more connectedness to their communities, adolescents reported less anxiety. However, peer connectedness was not related to any outcomes. Examples of studies examining particular contexts of social support and connectedness are reported on below.

Family and parent support can be measured in multiple ways including concepts such as presence, relationship quality, and monitoring. Generally, research supports the idea that these factors have positive results on adolescent health and mental outcomes and serve as protective factors (Viner et al., 2012). One study assessed adolescents in an urban disadvantaged

community across their 4 years at high school (Eisman et al., 2015). Using a resilience framework, they investigated whether peer and parent support would reduce the risk of depressive symptoms over time for kids with violence exposure. Analyzing data from self-report measures, they found that violence exposure added to the risk of depressive symptoms over time. Maternal support emerged as a protective factor, such that increased support from mothers was more strongly related to reduced depression for those who were exposed to violence. They did not find support for the positive role of peer support. These findings suggest the need to investigate support from other adults in adolescents' lives. Additionally, research has supported that across diverse groups, adolescents who perceive more support from their parents are more likely to have fewer depressive symptoms, higher self-esteem, and fewer suicide attempts (Ackard et al., 2006; Barber et al., 2005).

Of course, as adolescents spend the majority of their time at school, this serves as an important environment as well. There is a broad set of literature suggesting that aspects of positive school connectedness have encouraging links to adolescent mental health and well-being. Specifically, adolescents' connectedness to school, involving the school's social environment interacting with adolescents' needs for autonomy, competence, and relatedness, results in positive relationships to their health and well-being (Waters et al., 2009). School connectedness has been shown to be strongly related to mental health symptoms such as depression, anxiety, and general functioning both concurrently and longitudinally (Shochet et al., 2006). In fact, even in the context of good overall social connections, low *school* connectedness has been shown to be related to an elevated risk of anxiety/depressive symptoms (Bond et al., 2007). Similarly, adolescents' perception of having better social belonging at school has been associated with fewer depressive symptoms (LaRusso et al., 2008; Loukas & Robinson, 2004).

With adolescents gaining independence as they move on from childhood, they are more likely to be out of the house and on their own, so the neighborhood environment and broader community in which they live becomes increasingly important. Collective efficacy theory was built using the concepts of social cohesion, trust, and shared expectations of social control as a way to understand processes affecting neighbored crime and youth development (Sampson et al., 1997). Neighborhood collective efficacy relates to how residents get along, share values, and can be counted on to take action. A neighborhood with higher collective efficacy has traditionally meant that adults and youth are more likely to know one another and work towards discouraging violence and crime. Research on neighborhood collective efficacy includes associations with juvenile delinquency, physical health and health risk behaviors and more recently, mental health (Browning et al., 2008; Browning & Cagney, 2002; Donnelly et al., 2016; Fagan et al., 2014; Maimon et al., 2010; Simons et al., 2005). The relationship to mental health has been theorized to occur directly through concepts such as social support, solidarity, and shared trust (Browning & Cagney, 2002). Using a nationally representative birth-cohort sample, a study found that parent-rated neighborhood collective efficacy was associated with improvements in adolescent mental health (Donnelly et al., 2016). Other work has similarly found that neighborhood collective efficacy provides protecting benefits after violence exposure by improving adolescent functioning, such as reduction in substance use and suicide attempts (Fagan et al., 2014; Maimon et al., 2010).

There is a large body of work showing that when it comes to resilience, amount and timing of protective factors matter (Masten & Barnes, 2018). Research also suggests that there are windows of opportunities for interventions that will best promote resilience, and there is reason to believe that adolescence can be one of those key developmental periods (Masten, 2004,

2019; Masten & Barnes, 2018). In order to improve our understanding of how to target interventions for diverse youth who have experienced adversity, the underlying processes require more elucidation through prospective, longitudinal study of the intersection of familial, school, and neighborhood contributors to the psychological functioning of youth.

The Present Study

This study replicates and builds on previous work in numerous ways. This study uses longitudinal data from a racially and ethnically diverse, and socioeconomically high-risk sample with a focus on outcomes during adolescence. A deeper investigation into the accumulation and duration of ACEs is explored, leveraging these longitudinal data. A recent study noted that, "[l]ong-term effects among adults have been found in previous studies; but there is limited research on the association between ACEs and adolescent development and even less on potential protective factors..." (Moore & Ramirez, 2016; p. 299). Even further, the outcomes in this study are centered on mental health functioning and well-being, crucial and understudied constructs during adolescence that highlight a strengths-based approach. Similarly, adolescence is a vital time for understanding the contributions of social contexts to buffering against adverse experiences. As such, social support is examined across multiple contexts, including family members, schools, and neighborhoods. Importantly, adolescents report on their own perceived level of support/relationships and mental health outcomes as a way to capture their unique perspective and experience. These relationships are approached from a resilience framework by working toward identification of protective factors aimed at informing interventions. Altogether, this study explores the extent to which the relationship between ACEs and mental health depends on various aspects of social support for a vulnerable population of adolescents due to their exposure to adversity and economic disadvantage. This adversity is examined in multiple

nuanced ways; a total cumulative score to better capture occurrences over a long period of time, timing to see whether certain developmental periods are particularly significant, and consistency to understand the impact of chronic levels of high adversity. Altogether, this represents a more comprehensive understanding of the ways in which ACEs contribute to the growing mental health crisis.

To do this, this study leverages the *Fragile Families and Child Wellbeing* study (FFCWB). Data were longitudinal and collected at years 1, 3, 5, 9, and 15. ACE scores were calculated at each of these years and outcomes included adolescent-rated depression, anxiety, and positive functioning/well-being (collected at the beginning of year 15). Moderators included adolescent perspectives of caregiver-adolescent relationships, connectedness at school, and neighborhood collective efficacy.

Aims and Hypotheses

Aim 1: A Descriptive Look at ACEs Across Time

What do ACEs look like in a diverse, high-risk sample across five time points from birth through adolescence? Additionally, how do they accumulate across the five time points?

Hypothesis: I hypothesized that the cumulative number of ACEs would be higher in this study than reports from less disadvantaged samples. Previous research suggested that ACEs, particularly the child maltreatment components, would also be higher during early childhood.

Aim 2: Understanding Individual Time Points, Cumulative ACEs, and High Adversity of ACEs.

2.1: To what extent does one way of measuring ACEs (total across childhood) have an advantage over other ways (particular time points) in best predicting variation in mental health outcomes in adolescence?

Hypothesis: The literature is inconsistent as to whether ACEs at a specific point in development is especially important in predicting later outcomes, and limited when considering mental health outcomes in adolescence. However, due to existing work around cumulative risk and the importance of the accumulation of ACEs, I hypothesized that greater cumulative exposure to ACEs would predict worse mental health outcomes in adolescence, in comparison to specific time periods.

2.2: Further, do consistent levels of high exposure to adversity over time predict adolescent mental health outcomes?

Hypothesis: Following the literature on the consequences of toxic stress, it was expected that more consistent exposure to high levels of ACEs would relate to worse mental health outcomes in adolescence.

Aim 3: Moderation of Social Support from Caregivers, Schools, Neighborhood

To what extent does the hypothesized negative relationship of cumulative adversity across time and mental health outcomes depend on supportive relationships in adolescents proximal environments (caregiver-adolescent relationships, school connectedness, neighborhood collective efficacy)?

Hypothesis: I hypothesized that each of these social support factors would reduce the hypothesized negative relationship between higher cumulative ACEs and worse adolescent mental health and well-being.

CHAPTER III

Methods

Data & Sample

Data for this dissertation are from the *Fragile Families and Child Wellbeing* (FFCWB) birth cohort study (Princeton University, 2019; Reichman et al., 2001). This is a nationally representative, longitudinal, and ongoing study. Using stratified random sampling, 20 cities were selected from all U.S. cities with 200,000 or more people. From that, 75 hospitals were chosen (randomly sampled when necessary) and random sampling of birth logs between 1998 and 2001 identified 4,898 families. The original aims of the study focused on non-marital childbearing, welfare reform, and the role of fathers. Thus, unwed couples were oversampled, resulting in a comparatively disadvantaged sample of families. Data were collected at birth (baseline), and then follow-up data collection windows occurred at years 1, 3, 5, 9, and 15.

The analytic sample for the proposed study includes children from families who completed the relevant waves of data collection and specific surveys for collecting information about ACEs. Importantly, the children must also be included in the year 15 data wave (including the adolescent survey) for inclusion in the final sample. This dissertation specifically uses data from the core mother and/or primary caregiver surveys at all time points, as well as the adolescent survey at year 15. Information from these surveys was collected via telephone interview at each time point.

Measures

Adverse childhood experiences. The FFCWB study did not use a specific ACE questionnaire. However, previous studies have used ACE exposures from this data set and commented on how the longitudinal data, population at high risk for adversity, and

comprehensive assessment of child and family maltreatment and dysfunction make the study a prime contribution to the ACE literature (Jimenez et al., 2016, 2017; Reichman et al., 2018). Specifically, programming code was obtained and used from previous studies measuring ACEs with FFCWB data (Reichman et al., 2018). The following construction of ACEs was derived directly from the work of Reichman and colleagues with data from year 5 (refer to their article for additional details). For this dissertation, information on ACEs were extended to include years 1, 3, 9 and 15 as well. Decisions were made to mirror what was determined for year 5 as closely as possible.

Child maltreatment. Four variables will be used to capture child maltreatment: physical abuse, emotional abuse, sexual abuse, and physical/emotional neglect. These variables were derived from mothers' responses on the Conflict Tactics Scale: Parent Child Version (CTS), which screened for physical and emotional abuse and neglect. Mothers were also asked if Child Protective Services (CPS) had been contacted regarding physical or sexual abuse or neglect. Emotional and physical abuse and neglect were considered present and counted as an ACE if their CTS domain score fell in the top 10th percentile or if there was an affirmative response about CPS involvement. Sexual abuse was only counted as an ACE if there was an affirmative response based on CPS involvement. CTS scores ask about the past year, and a date was provided for when CPS involvement occurred.

Household dysfunction. Five variables were used, including father absence, household member with mental illness or substance abuse, incarcerated household member, and domestic violence in the home. Due to the large proportion of unwed parents in the sample, father absence was used instead of divorce. Mothers were asked if the child's biological father was currently living in the household. If the mother answered "no," then one ACE was counted for father

absence. For mental illness, maternal depressive symptoms within the past year were assessed using the Composite International Diagnostic Interview- Short Form. If a score indicated that the mother was experiencing a depressive episode, then an ACE exposure was counted. For incarceration, mothers were asked whether she, the child's father, or a current live-in partner had spent time in prison or jail in the past 2 years. An affirmative response to any of these questions counted as one ACE. For domestic violence, mothers answered questions from the Conflict Tactics Scale asking about physical and sexual violence towards herself by the biological father or current live-in partner in the past year. Answers of "sometimes" or "often" vs. "never" on any of these items on CTS counted as an ACE. For substance abuse, mothers were asked whether she, the child's biological father, or her current live-in partner had problems due to alcohol or drug use. An affirmative response to any of these questions counted as an ACE.

Construction of ACEs index scores. Following previous work, all individual ACE items are dichotomous (0, 1) and then summed to produce an overall ACE index score. This was done for each time point (years 1, 3, 5, 9, 15). ACEs will not be calculated at baseline (birth), because it was premature to inquire about key ACEs such as child maltreatment and the year 1 data reflect the past year of the child's life. When there was insufficient information (i.e., no items collected to address that category) for a particular ACE at a particular time point, those ACE categories were not used in the index. This occurred for the following ACEs- year 1 sexual abuse, year 1 psychological abuse, year 1 neglect, and year 3 sexual abuse. Thus, ACE index scores range from 0-6 for year 1 and 0-8 for year 3, compared to 0-9 at years 5, 9 and 15. A total cumulative ACE index score was also created, averaging the ACE scores from each of the five time points. Thus, each child has six separate ACE scores (one for each of the five timepoints and one cumulative). As part of Aim 3, to assess for high adversity over time, we also

categorized ACE scores at each time point as 0 (absence of high adversity) or 1 (high adversity). Presence of high adversity was an ACE score of 5 or more at a single timepoint. These scores of 0 or 1 were summed across each of the five timepoints such that, each child has a score ranging from 0-5 representing high adversity over time. The cutoff of an ACE score of 5 was determined by being two standard deviations above the mean number of ACEs in this sample and having only a marginal correlation with the cumulative ACE score. This also follows past work where high adversity is represented by an ACE index of greater than at least three or four (Felitti et al., 1998; Jimenez et al., 2016, 2017; Sacks & Murphey, 2018).

Adolescent self-reported outcomes.

Depression. Five items from the Center for Epidemiologic Studies Depression Scale (CES-D), including "I feel sad" and "I feel that life is not worth living," were used to measure adolescent depressive symptoms (Radloff, 1977). These five items used for the FFCWB study were found to be superior to the 20 original items when validated for use with ethnically and racially diverse adolescents (Perreira et al., 2005). Adolescents were asked to respond to these items based on the past 4 weeks and rated each statement on a 4-point scale (1-4) ranging from "strongly disagree" to "strongly agree." A depression scale was created using the average of the five items. This scale demonstrated acceptable internal consistency ($\alpha = 0.75$). Necessary items were reverse coded so that higher scores represent greater depressive symptoms.

Anxiety. Six items from the Brief Symptom Inventory 18 (BSI 18) were used to measure adolescent anxiety symptoms, modified from an anxiety subscale (Derogatis & Savitz, 2000). Adolescents responded to items based on the past 4 weeks (e.g., "I feel tense or keyed up," "I feel nervous or shaky inside") on a 4-point scale (1-4) from "strongly disagree" to "strongly agree." An anxiety scale was created using the average of the six items. This scale demonstrated

acceptable internal consistency ($\alpha = 0.75$). Necessary items were reverse coded so that higher scores represent greater anxiety symptoms.

Positive functioning. Twenty items adapted from the EPOCH Measure of Adolescent Wellbeing (Kern et al., 2016) were used to measure adolescent positive functioning and well-being on specific dimensions of engagement, perseverance, optimism, connectedness, and happiness. Examples for each factor are as follows: engagement ("I get completely absorbed in what I am doing"), perseverance ("I am a hard worker"), optimism ("I am optimistic about my future"), connectedness ("There are people in my life who really care about me"), and happiness ("I love life"). Adolescents responded to the items about how much they agreed with each item in thinking about the past 4 weeks on a 4-point scale (1-4) from "strongly disagree" to "strongly agree." A positive functioning scale was created using the average of the 20 items. This scale demonstrated acceptable internal consistency ($\alpha = 0.80$). Necessary items were reverse coded so that higher scores represent greater positive functioning.

Connectedness/social support moderators.

Caregiver-adolescent relationship. Items from the Family Functioning and the Middle Childhood and Adolescent sections of the National Survey of Children's Health were used to assess the adolescents' relationship with their primary caregivers (United States Department of Health And Human Services, 2007). One item was used to measure closeness on a 4-point scale (1-4) from "close" to not "very close." Another item was used to measure the degree to which the dyads talk and share ideas on a 4-point scale (1-4) from extremely well to not very well. Each of these two questions were asked separately for the adolescent's mother, mother's partner, father, and father's partner. Items were recoded such that higher scores indicated better relationships. For theoretical reasons, both items were collapsed into one mean score for each

caregiver. Then, the highest score across all four caregivers was used to capture the highest level of perceived support, regardless of the specific caregiver or missingness due to caregiver absence.

School connectedness. Four items taken from the Panel Study of Income Dynamics Child Development Supplement (PSID-CSD-III) were used to measure adolescents' feelings of inclusiveness, closeness, happiness, and safety at school (*The Panel Study of Income Dynamics Child Development Supplement: User Guide for CDS-II*, 2010). Examples include "[f]eel close to people at school" and "[f]eel part of school." Adolescents were asked how much they agree or disagree with each item currently on a 4-point scale (1-4) from "strongly agree" to "strongly disagree." A school connectedness scale was created using the average of the four items. This scale demonstrated acceptable internal consistency ($\alpha = 0.73$). Necessary items were reverse coded so that higher scores represent more school connectedness.

Neighborhood collective efficacy. Eight items modeled after previous work were included to assess adolescent's perceptions about informal social control and level of cohesion and trust as a way to measure neighborhood collective efficacy (Sampson et al., 1997). All items were on a 4-point scale (1-4) from either "very likely" to "very unlikely" or "strongly agree" to "strongly disagree." Examples include "people around here are willing to help their neighbors" and "people in this neighborhood can be trusted," as well as likelihood of seeing experiences such as children skipping school or showing disrespect to an adult. A neighborhood collective efficacy scale was created using the average of the eight items. This scale demonstrated acceptable internal consistency ($\alpha = 0.76$). Necessary items were reverse coded so that higher scores represent higher levels of collective efficacy.

Covariates. Covariates were modeled after prior work examining ACEs using the FFCWB study (Jimenez et al., 2016, 2017; Reichman et al., 2018) to account for general demographics and sampling criteria and in place of sampling weights (additional information provided in following section). Child demographic characteristics included child sex (female; male [reference group]), race/ethnicity (White, non-Hispanic [reference group]; Black/African American, non-Hispanic; Hispanic/Latino; other, not-Hispanic; multiracial, non-Hispanic), and age at year 15 data collection (continuous). Maternal demographic characteristics included age at baseline (continuous), education level at baseline and year 15 (less than high school [reference group]; high school or equivalent, some college/technical school; college or graduate school), marital status at baseline (marred; not married [reference group]), as well as race/ethnicity (White, non-Hispanic [reference group]; Black, non-Hispanic; Hispanic; other) and current household income at baseline and year 15 (continuous household income).

Chapter IV

Results

Analytic Approach

The data analytic process began with selecting the subsample to be used for analysis, as well as identifying and handling missing data. Next, the variables of interest were prepared and necessary psychometrics were performed. Following that, preliminary descriptive and correlational data analyses took place, including examination of research Aim 1. Finally, models examining research Aims 2 and 3 were conducted. Details for each of these phases are described below. All analyses were completed using STATA Version 16.1 (StataCorp, 2019).

Selection of sample & missing data. Families were considered ineligible for the year 15 wave if the focal child was deceased or legally adopted into another family, leaving 4,663 eligible families (95% of baseline). Of these, 3,580 caregivers (77% of eligible) and 3,444 adolescents (74% of eligible) completed interviews. Thus, the largest possible sample was 3,444, as adolescent-reported data were the primary outcomes and moderators. From that, families had to also have completed specific questionnaires from years 1, 3, 5, and 9 to obtain adequate information on ACEs. This restricted the sample size to a total of 1,960 families. Independent samples *t*-tests and chi-square analyses were conducted between the final subsample (N=1960) and those excluded from the full baseline sample (N=2938) and age 15 follow-up (N=1484) to determine significant differences on key demographic characteristics (Table 1). Similar patterns of differences compared to other studies using subpopulations emerged. Compared to those who were excluded from the total baseline sample, the final analytic sample includes families with a higher household income, mothers with more education, more mothers who are white and black and fewer who are Hispanic, and fewer children who are Hispanic. Compared to those who were

excluded from the total year 15 sample, the final analytic sample includes mothers who were older at baseline, children who were younger at year 15, mothers who were more educated at baseline and year 15, more mothers who are white and fewer who were Hispanic, and fewer children who were Hispanic.

Consistent missing data codes were used for all variables; -1 Refuse, -2 Don't know, -3 Missing due to technical error, -4 Multiple answers, -5 Not asked, -6 Logical skip, -7 Not applicable, -8 Out-of-range, -9 Not in wave. These were used to determine missingness and reason for missingness. Due to the nature of calculating ACE variables across many items and timepoints, most missing data occurs in the ACE index and summary variables. Thus, the creation of the ACE index and summary scores resulted in different sample sizes, as reflected in Table 3. Differences across index scores were due to missing data in the questions used to determine specific ACE variables. There was then missing data in the summary scores when all data across all timepoints was not available. Very little missing data was observed in the outcomes, moderators, and covariates. While multiple imputation at the item level was thought to be the most ideal way to address missing data in this sample, difficulties with convergence due to the number of items and categorical nature of the data prohibited its use. Ultimately, Full Information Maximum Likelihood (FIML) was used. Using FIML does reduce precision in my estimates and also has the possibility of increasing false positives (type 1 error). The following steps were taken to account for these limitations and to increase confidence in the results. Robust standard errors were calculated. Benjamini-Hochberg *p*-value corrections, applying a conservative false discovery rate level (.025), were used in interpreting results of regression models to reduce type I error rates (Benjamini & Hochberg, 1995). Power and boxcox transformations of variables were applied using the "mboxcox" package in Stata to better

represent multivariate normality (Lindsey & Sheather, 2010). Sensitivity analyses using these transformations (along with FIML) were completed and compared to the results of models using FIML without variable transformations. No significant changes in model outcomes were found. Thus, final reported models are with untransformed data for the ease of interpretation. Additionally, sensitivity analyses were conducted to compare results from final models using FIML to models using the most restrictive dataset of complete cases where FIML was not needed. Again, no significant changes in model outcomes were found.

FFCWB provides sampling weights to adjust for the sample design (probability of selection), non-response at baseline, and attrition based on observed characteristics over the waves. Numerous factors were considered in determining whether to apply these weights to analyses in the current study. First, there is mixed and imprecise guidance about use of weights, particularly for cross-wave analysis (Fragile Families and Child Wellbeing Study, 2008). Information from an online memo states that the weights were set-up for cross-sectional questions only, and not longitudinal ones. Importantly, papers with longitudinal components (and even those without) most often use covariates that went into making the weights, rather than applying weights themselves (Carlson et al., 2011; Pilkauskas et al., 2018; Wang et al., 2020). Specifically, most work using FFCWB with ACEs chose this approach (Reichman et al., 2018; Schroeder et al., 2018) or does not mention any method at all (Hunt et al., 2017; Lipscomb et al., 2019). This was substantiated by FFCWB data support as a common methodological choice that still takes into account important aspects of the complex sampling design (FFData. Personal communications, May 2020). As a final check, the “wgttest” package in Stata was used to evaluate the significance of the impact of sampling weights on estimation results (Dumouchel & Duncan, 1983). There are situations when unweighted estimates are preferable and more efficient

(Winship & Radbill, 2016). Results indicated that the weighted and unweighted estimates were not significantly different and proceeding with unweighted estimates was appropriate. Thus, in this study, descriptive analyses were unweighted and regression models controlled for ranking variables used to create the weights (mother's baseline age and marital status, race/ethnicity, and education) rather than applying the weights themselves. Information provided directly from FFCWB indicated that weights do not need to be applied in analyses when this approach is taken. As such, this study builds on and is comparable to similar past work, though cannot be said to retain generalizability to a nationally representative sample.

Variable preparation. The ACE scores were calculated at each time point following code obtained from Reichman et al. (2018). Specifics around the creation of the ACE scores and variables can be found in the methods. To summarize, final variables include an ACEs index score (range = 0-9) measured at years 1, 3, 5, 9, and 15, as well as a total cumulative score across all of those time points. A cut point of an ACE index of > 5 was used to reflect high adversity at each time point and a final sum score representing high adversity over time was created (range = 0-5). Outcomes (adolescent-rated depression, anxiety, positive functioning) and moderators (adolescent-rated caregiver relationships, school connectedness, neighborhood collective efficacy) were averaged within scales as laid out in the measures section. Variables were recoded as necessary to reflect that higher scores represent more of that construct (e.g., higher depression scores mean more depressive symptoms). While guidance from the data manual for FFCWB was followed, internal consistency was also confirmed by calculating Cronbach's alpha for each scale as stated in the methods. No alphas fell below .70 and bivariate correlations did not indicate improved scale consistency by removing particular items.

Aim 1- A descriptive look at ACEs. The first set of analyses produced a comprehensive list of demographic characteristics for the sample at year 15, including key outcomes and moderators. Next, descriptive statistics were conducted for ACEs across the five time points, exploring the means, variability, and percentages. This provides information around Aim 1. Correlation matrices of all key predictors, outcomes, moderators, and covariates were also completed to look at relationships among variables. These correlations were used to assess potential multi-collinearity in regression models, particularly amongst the various ACE variables. Decisions about this will be noted in the results section.

Model preparation for aims 2 and 3. In line with previous work with this data set, we did not account for nesting of children. While it was planned to calculate intraclass correlation coefficients (ICCs) at the level of hospitals and cities, it was later discovered that there are no hospital or city identifiers available for public use. Predictor variables in interaction models were centered around the grand mean to allow for ease of interpretation of parameter estimates. For all models, global effect size (R^2) and local effect size (Cohen's *f*) were calculated. This tells us the percentage of variance in the outcomes explained by the predictors as well as the significance of the effect. The same three adolescent-rated mental health outcomes were used separately across all models. Various forms of ACE scores were used as predictors and moderators were added in a final step. More specific details of models relative to each aim are provided below.

Aim 2 – Individual time points compared to cumulative **and high adversity of ACEs.** For part 2.1, ACE scores at year 1, 3, 5, 9, 15 and the cumulative score were used in separate multiple linear regression models to predict adolescent depression, anxiety, and positive functioning. Due to collinearity, all 5 years and the cumulative score could not be used in the same model. The correlations of the five ACE index scores were low enough to be used in the

same models (three models total, one for each outcome). Then, the cumulative ACE score was used in its own set of models (three models total, one for each outcome). All models also included covariates. R^2 values were compared across the models to address the impact of cumulative ACEs over time compared to collectively examining a set of individual timepoints. The purpose here was to determine whether there is anything unique about one given time point, beyond the overall cumulative score.

For part 2.2, new sets of models were performed, which included the calculated score representing high adversity across time and covariates. This resulted in another three models, one for each of the three outcomes. Again, comparison of R^2 values was used to understand the relative impact of this predictor compared to the predictors in part 2.1.

Aim 3 – Moderation of Social Support from Caregivers, Schools, Neighborhood. Finally, moderation variables and interaction terms were added to the models with the cumulative ACE score to test the extent to which more supportive relationships relate to better outcomes. In a first step, just the three moderators (caregiver-adolescent relationship, school connectedness, and neighborhood collective efficacy) were added to test for main effects of total cumulative ACEs and three types of social support. Following that, three interaction terms, between each moderator and the total cumulative ACEs, were added in independent models. This resulted in nine additional models, three for each of the three outcomes.

Aim 1 Results - A Descriptive Look at ACEs

Demographic information. Means and standard deviations for key outcomes and moderators at year 15, as well covariates at baseline and year 15, can be found in Table 2. The sample consists of a total of 1,960 adolescents (51% male) with an average age of 15.40 years old, the majority of whom identify as Black (47.35%). Mothers at baseline were on average

25.24 years old, primarily Black (50.71%), and mostly unmarried (74.80%). Please refer to Table 2 for additional characteristics regarding parental education and household income at baseline and year 15.

Outcomes and Moderators. On average, adolescents at year 15 reported relatively low levels of depressive (*M*=1.60, *SD*=.60) and anxious (*M*=1.82, *SD*=.65) symptoms and higher levels of positive functioning (*M*=3.43, *SD*=.33), all reported on a scale from 1-4. Adolescents also reported high levels of positive relationships with at least one caregiver (*M*=3.41, *SD*=.66) and connectedness at school (*M*=3.44, SD=.58), as well as moderate levels of neighborhood collective efficacy (*M*=2.86, SD=.62); again, all reported on a scale from 1-4.

ACE Descriptives. It is important to note that when interpreting all tables and graphs, the total possible ACEs for year 1 is 6 and for year 3 is 8 while years 5, 9, and 15 have a total of 9 possible ACEs. Summary and composite scores are presented in Table 3. Adolescents experienced a similar number of ACEs at each year ranging from a mean of 1.05 to 1.64. Adolescents experienced an average of about 5 total ACEs across time (total sum, *M*=5.45, *SD*=4.51) or an average of about 1 ACE at each timepoint (total average, *M*=1.09, *SD*=.90). Looking at a sum of total ACEs across time, Table 4 shows that only about 10% of adolescents experienced no ACEs, 40% experienced 1-4, and the remaining 50% experienced 5 or more. In this sample, 5 or more ACEs at any one time point represents at least 2 standard deviations above the mean. Related to experiencing high adversity across time, most adolescents (92.96%) did not have 5 or more ACEs at any one timepoint. Modest numbers of adolescents had 5 or more ACEs at one time point (5.93%), two time points (.93%) and three time points (.19%). The bottom of Table 5 demonstrates the number of ACEs at each year displaying a similar pattern, with the highest proportion of children experiencing 0 or 1 ACE at each year. At all years, as the number

of total ACEs increases, the percentage of children experiencing that number of ACEs decreases (Table 5). Relatively low percentages of children experience four ACEs (less than 8%) and five ACEs (less than 5%) at all years.

Table 5 also provides information about the experience of individual ACE categories. Across all years, the most common ACE that children experience is father absence with the least common being sexual abuse. Within ACE categories, there are apparent differences in occurrence across years (e.g., low proportion of parental incarceration and physical abuse at year 1; low proportion of neglect at year 15).

Bivariate correlations. Correlations for key outcomes, predictors, and covariates can be found in Table 6. Overall, most variables are significantly related to each other though the strength of these relationships vary. All three outcomes (depression, anxiety, positive functioning) are moderately correlated with each other in predicted directions but not so highly correlated that they do not represent distinct constructs. All ACE variables have low correlations with both outcomes and moderators. Additionally, ACE index variables at each time point are not highly correlated with each other but are highly correlated with the total cumulative ACEs and moderately correlated with high adversity ACEs. Many covariates are weakly, albeit significantly, correlated with outcome variables.

Aim 2.1 Results - Individual Time Points Compared to Total Cumulative ACEs

The results for the models collectively examining a set of individual time points (years 1, 3, 5, 9, 15) can be found in Table 7. There were no effects of ACEs at years 1, 3, 5, or 15 across all three outcomes. ACEs measured at year 9 significantly predicted adolescent depression, β = .09, $p \leq .05$ and positive functioning, β = -.10, $p \leq .01$, but not anxiety. Patterns suggest that greater exposure to ACEs is related to more depressive symptomology and less positive

functioning. Global effect size suggests slightly more explanatory power of the models addressing depression (R^2 = .05) compared to positive functioning (R^2 = .03). Although, year 9 ACEs seem to operate similarly for both depression and positive functioning, when comparing standardized coefficients which are similar and local effect size which is identical (F^2 = .01). Overall, both global and local effect sizes are small. In addition, girls were more likely than boys to report more depressive and anxious symptoms and less positive functioning, children identifying as Hispanic were more likely to report more positive functioning compared to white children, and children who had parents who completed some college at year 15 were more likely to report lower depression compared to parents who did not complete high school.

The results for the models addressing cumulative ACEs across all years can be found in Table 8. There were significant effects of cumulative ACEs across all three outcomes and with similar patterns. Higher ACEs predicted greater depressive, β = .23, $p \leq .001$ and anxious symptoms, β = .11, $p \leq .05$, whereas lower ACEs predicted more positive functioning, β = -.21, $p \leq .001$. Models using cumulative ACEs as a predictor explained more variance (R^2 depression = .07; R^2 anxiety = .02; R^2 positive functioning = .05) compared to models using ACEs from individual time points (R^2 depression = .05; R^2 positive functioning = .03). Overall, even the models with cumulative ACEs and the highest R^2 values, explain a relatively low proportion of variance. Similarly, precise magnitudes (local effect size) of cumulative ACEs on each of the three outcomes are small (F^2 depression = .04; F^2 anxiety = .01; F^2 positive functioning = .03). In addition, girls were more likely than boys to report more depressive and anxious symptoms and less positive functioning.

Aim 2.2 Results - High Adversity of ACEs

The results for the models addressing high adversity can be found in Table 9. The presence of high adversity across time significantly predicted adolescent depression, $\beta = .12$, $p \leq .05$ and positive functioning, $\beta = -.12$, $p \leq .01$, but not anxiety. Similar to other patterns, more ACEs predicted more depressive symptomology, whereas fewer ACEs predicted more positive functioning. Models using cumulative ACEs as a predictor still explained more variance (R^2 depression = .07; R^2 positive functioning = .05) compared to models using high adversity (R^2 depression = .04; R^2 positive functioning = .03). Thus, high adversity did not seem to perform better as a predictor compared to the total average. Further, post-hoc models including both cumulative ACEs and high adversity were run and cumulative ACEs was the only predictor that remained significant. For models assessing high adversity, local effect sizes were the same for both outcomes and small ($F^2 = .01$). Again, girls were more likely than boys to report more depressive and anxious symptoms and less positive functioning and children identifying as Hispanic were more likely to report more positive functioning compared to white children.

Aim 3 Results- Moderation of Social Support from Caregivers, Schools, Neighborhood

Moderation effects by caregiver relationship. The results for the models addressing the moderation of caregiver relationships can be found in Table 10. All three models showed significant main effects of a positive caregiver relationship (depression, $\beta = -.21$, $p \leq .001$; anxiety, $\beta = -.17$, $p \leq .001$; positive functioning, $\beta = .29$, $p \leq .001$). Patterns suggest that a more positive caregiver relationship was related to less depressive and anxious symptomology and more positive functioning. There were also main effects of cumulative ACEs for models predicting depression ($\beta = .19$, $p \leq .001$) and positive functioning ($\beta = -.15$, $p \leq .001$), but not anxiety. These patterns parallel findings from aim 2.1 models, such that higher ACEs predicted greater depressive symptoms while lower ACEs predicted more positive functioning. Here,

models as a whole, predict more variance (R^2 depression = .11; R^2 anxiety = .05 ; R^2 positive functioning = .12), compared to previous models only including cumulative ACEs as a predictor (R^2 depression = .07; R^2 anxiety = .02; R^2 positive functioning = .05). For these models with caregiver relationship variables predicting depression and positive functioning, local effect sizes remain small for the strength of cumulative ACEs predicting depression (F^2 = .03) and positive functioning (F^2 = .02). They also remain small for the relationship between caregiver relationship and depression (F^2 = .04) and anxiety (F^2 = .03) but begin to approach a medium effect for positive functioning (F^2 = .09). However, no interaction effects emerged, indicating that the caregiver relationship did not moderate the relationship between ACEs and mental health.

Moderation effects by school connectedness. The results for the models addressing the moderation of school connectedness can be found in Table 11. All three models showed significant main effects of school connectedness (depression, β = -.31, $p \leq .001$; anxiety, β = -.20, $p \leq .001$; positive functioning, β = .38, $p \leq .001$). Patterns suggest that more school connectedness was related to less depressive and anxious symptomology and more positive functioning. There was also a main effects of cumulative ACEs for the model predicting depression (β = .14, $p \leq .05$), but not anxiety or positive functioning. Once again, models as a whole, predict more variance (R^2 depression = .15; R^2 anxiety = .06 ; R^2 positive functioning = .15), compared to previous models only including cumulative ACEs. These global effects are also largest when compared to models including caregiver and neighborhood predictors. For these models with school predictors, local effect sizes remain small for the strength of cumulative ACEs predicting depression (F^2 = .02). They also remain small for the relationship between school connectedness and anxiety (F^2 = .04) but display medium local effects when predicting depression (F^2 = .10) and positive functioning (F^2 = .16).

Additionally, there was a significant interaction between cumulative ACEs and school connectedness on anxiety, $\beta = .57$, $p \leq .05$. Figure 3 shows plots of the predicted values of regression lines at low, moderate, and high levels of school connectedness. Adolescents who experienced few ACEs reported low anxiety, regardless of their level of self-reported school connectedness. However, when adolescents experienced the combination of high cumulative ACEs and a strong sense of school connectedness, they were much more likely to report high anxiety than their peers with high cumulative ACEs but a weak connection to school. Nonetheless, simple slopes tests were not significant for any levels of school connectedness suggesting the relationships described may not be apparent. The model with this significant interaction explained a similar amount of variance ($R^2 = .07$) compared to the same model without the interaction term and the interaction term produced a small effect ($F^2 = .01$). No school connectedness by cumulative ACEs interaction effects emerged for models predicting depression or positive functioning.

Moderation effects by neighborhood collective efficacy. The results for the models addressing the moderation of neighborhood collective efficacy can be found in Table 12. All three models showed significant main effects of neighborhood collective efficacy (depression, $\beta = -.12$, $p \leq .001$; anxiety, $\beta = -.14$, $p \leq .001$; positive functioning, $\beta = .18$, $p \leq .001$). Patterns suggest that more neighborhood collective efficacy was related to less depressive and anxious symptomology and more positive functioning. There were also main effects of cumulative ACEs for models predicting depression ($\beta = .23$, $p \leq .001$) and positive functioning ($\beta = -.20$, $p \leq .001$), but not anxiety. Again, these relationships are similar to those noted in models from aim 2.1, such that higher ACEs predicted greater depressive symptoms whereas lower ACEs predicted more positive functioning. Again, models as a whole, predict more variance (R^2 depression =

.08; R^2 anxiety = .04 ; R^2 positive functioning = .08), compared to previous models only including cumulative ACEs. However these global effects are smaller when compared to caregiver relationship variables. Again, for these models with the inclusion of neighborhood variables, local effect sizes remain small for the strength of cumulative ACEs predicting depression (F^2 = .04) and positive functioning (F^2 = .03). They also remain small for the relationship between neighborhood collective efficacy and depression (F^2 = .02) and anxiety (F^2 = .02) and positive functioning (F^2 = .03). No interaction effects emerged as significant, indicating that neighborhood collective efficacy did not moderate the relationship between ACEs and mental health.

Summary. Overall, cumulative ACEs are the strongest in predicting outcomes (more so than high adversity over time or individual time points). Models that include cumulative ACEs in association with social support variables explain the most variance in outcomes. In addition, comparisons of global effect size suggests more explanatory power of models predicting depression and positive functioning, compared to anxiety and that of models including school connectedness predictors, compared to caregiver or neighborhood predictors. Effects of specific predictors appear strongest for school connectedness related to depression and positive functioning.

Chapter V

Discussion

When adolescents are faced with new changes and complexities, there is an opportunity for them to be met with support and encouragement. With the prevalence of adolescent mental health issues, suicides, and psychiatric hospitalizations on the rise (Blader, 2011; CDC, 2019), it is more important than ever to focus efforts on setting youth on, or getting them back to, a productive, healthy path forward. Certain adolescents may be at heightened risk for displaying compromised psychological functioning, when exposed to Adverse Childhood Experiences (ACEs) throughout their early years. This vulnerability may be increased for marginalized youth from low-income and/or minoritized families. In this dissertation study, childhood adversity was examined in multiple ways, including a focus on specific timing, average occurrences over time, and chronic levels of high adversity. In addition, this study embraced a strengths-based approach by examining elements of youths' context that might serve a protective function. In particular, supportive social contexts in adolescents' most proximal environments (home, schools, neighborhoods) were hypothesized to reduce the risk of ACEs for youth mental health issues.

The *Fragile Families and Child Wellbeing* study (FFCWB) followed children born in 75 hospitals across 20 cities in the United States; these children were from racially/ethnically and socioeconomically diverse families, with a high proportion of unwed mothers. This represents one of the largest samples of families under these circumstances, whose children were followed from birth through adolescence. All further discussion of results from this study are interpreted with these sample characteristics in mind. Utilizing longitudinal data from FFCWB, the current study sought to more comprehensively understand the ways in which ACEs contribute to the

growing mental health crisis, while also investigating relational supports that may increase resilience and alleviate poor mental health outcomes in the face of adversity.

ACEs from Birth through Adolescence in Urban, Low-Income Communities

Overall ACE Prevalence. A benefit of this study was the ability to measure ACEs with rich questionnaire data, at multiple time points, and in a way that captures children's experiences from birth through adolescence. For multiple reasons, this measurement is likely to be more accurate, precise, and comprehensive compared to more traditional methods that have persisted. Many wide-spread reports of ACEs are still adults reporting retrospectively on their childhood about whether ACEs *ever* happened and by responding to a yes/no questionnaire with one item per ACE. This may reflect inaccurate reporting, but it is also less helpful in assessing for more immediate, proximal outcomes and earlier prevention during childhood. National prevalence rates for children/adolescents, mostly based on a single, well-documented study, also rely on parent-report about ACEs at a single time-point and reflect occurrences that have *ever* happened, with a similar format of questionnaire. While this is an improvement on adult self-report, parents still reflected on many years of their child's life, allowing for bias in reporting. Importantly, in most adult self-report and parent-report, accumulation of children's experiences over time are not addressed. In this study, parents reported on questions more proximally to when ACEs were experienced. The questions at each time point reflect up to one year prior. So, for example, an index ACE score of "1" indicates that a child experienced 1 ACE in that previous year. Additionally, in most cases, whether a child experienced an ACE was determined by multiple questions rather than just one. Finally, total scores over time represent multiple occurrences of or cumulative ACEs, which is more characteristic of what children and adolescents actually experience.

While other studies using this sample have explored the nature of ACEs, this is the first to do so across all waves of data collection, including the most recent year 15. The way ACEs were defined and measured most closely followed the approach of Reichman et al. (2018), though their study sample differed and they only reported on year 5 ACEs. As expected, the number of ACEs at year 5 align very closely across their study and ours, and the two most frequently experienced ACEs (father absence and incarceration) are the same and in similar proportions. Another study used different methodology (albeit similar in some ways) and again a different subsample from FFCWB, looked at ACEs at years 1, 3, 5 and 9. Notably, they included fewer child maltreatment ACEs, did not include father absence, and looked at fewer ACEs overall. Nonetheless, they reported similar patterns of total ACE proportions, though with slightly higher percentages of 0 ACEs. Another more recent study assessed eight total ACEs at years 1, 3 and 5 within FFCWB, but in ways slightly different from the current study, yet reported similar proportions of total ACEs (Jones & Pierce, 2020). Further, the relation of year 15 ACEs to year 9 are similar to the way year 9 relates to year 5, in this sample and others mentioned above. They follow the general pattern of a slight reduction in total numbers of ACEs. Taken together, these examples reinforce that this study's assessment of ACEs is consistent with other similar studies using the FFCWB data set, with the addition of year 15.

National prevalence rates for ACEs in childhood/adolescence as reported by parents come from the National Survey of Children's Health (NSCH) in 2016 (Health Resources and Services Administration, 2016). This survey asked parents to respond to nine questions either online or on paper and data are nationally representative of children and adolescents from 0-17 years old. Comparing our sample to these data, similarities emerged. As the total number of ACEs increased, the proportion of children/adolescents having experienced that many ACEs

decreased and most children experienced 0 or 1 ACE (Bethell et al., 2017; Sacks & Murphey, 2018). The current sample had estimates of 30% for zero ACEs and 30% for one ACE (average across years) compared to estimates of 55% for zero ACEs and 24% for one ACE in the NSCH sample. The pattern persists with two (20%) and three or more (20%) ACEs in the current sample and two (11%) and three or more (10%) in the NSCH sample. When looking at these comparisons, adolescents in this sample experienced slightly greater adversity compared to national prevalence rates, as was predicted due to the high-risk nature of the sample. Nonetheless, comparisons are not ideal due to methodological differences already highlighted. Additionally, the NSCH sample did not assess for child maltreatment ACEs, which is a major disadvantage given their conceptualization within ACEs. In the current study, it is also important to recognize that some descriptive information about cumulative ACEs at the index level could still be unrepresentative. Results in Table 4 highlight different patterns by looking at the accumulation of the total *number* of ACEs across all time points rather than averages. Averaging the proportion of adolescents who do not experience any ACEs at a given time point results in an estimate of 30%. Sums across time indicate that there is actually a much lower percentage of adolescents who experienced no ACEs (9.81%) over 15 years. This further demonstrates the high-risk nature of this sample and their experience of more ACEs than national averages. However, other than the data on zero ACEs, information in Table 4 makes additional interpretation difficult. If we think about a child who experienced a sum of three ACEs across time, that could mean three separate ACEs and thus an ACE score of three on a standard ACE questionnaire, or the same ACE each time and thus an ACE score of one on a standard ACE survey. Over 15 years, there is the possibility that adolescents actually experienced a very high number of mutually exclusive ACEs, but additional descriptive analyses would need to be

performed to further understand specific patterns. As it stands, on average, children in this sample, in any one year of their life, experienced higher average proportions of ACEs compared to national prevalence rates.

High Adversity. When assessing for high adversity (conceptualized as 5 or more ACEs) at each individual time point, proportions are relatively low. Similar to what was mentioned previously, most adolescents either did not experience any single timepoint with greater than 5 ACEs, or experienced just one. In order to capture a variable that was distinct enough from the total cumulative, the cut off for high adversity had to be two full standard deviations above the mean number of ACEs at any given time point. As such, this variable represents a level of adversity that is quite high, which could very well account for the lack of variability. It is likely that the total cumulative (one ACE per year or five across 15 years) is already a gauge of high adversity, relative to other samples where more than three or four ACEs across 18 years is described as high (Felitti et al., 1998; Jimenez et al., 2016, 2017; Sacks & Murphey, 2018). Using a cutoff is also a rudimentary way to capture high levels of ACEs across time, suggesting the benefit of the cumulative score across time. Nonetheless, these data suggest that there were very few adolescents who consistently experienced very high levels of ACEs at multiple timepoints.

Additional Patterns. Additional patterns, such as a higher proportion of 0 and 1 ACE at year 1 compared to other years, also emerged. While it was hypothesized that ACEs would be higher in early childhood, that was not the case. This could be due, in part, to two measurement constraints. One, only a total of 6 ACEs were assessed at year 1. Three child maltreatment ACEs (neglect, psychological abuse, sexual abuse) were not part of the parent interview at this age. This is significant, because neglect is the most commonly experienced maltreatment type with

recent rates at 60% of all maltreatment cases (U.S. Department of Health & Human Services, 2020). The other measurement issue is that at year 1, even though physical abuse was assessed, there was only a single question compared to other years with multiple questions and with subsequent higher proportions of physical abuse. This is significant because after neglect, the most common form of maltreatment is physical abuse. This is also particularly important because children who are less than one year old are most likely to experience child maltreatment (26.7%) compared to 10.4% for children between the ages of 1-2 and 4-5 and 7.65% for ages 8-9 and 14-15 (the other time periods captured in this study; U.S. Department of Health & Human Services, 2020). So if physical abuse was under represented, in combination with missing the other maltreatment ACEs, reports for year 1 are likely misleading and potentially account for the lack of higher expected ACEs in early childhood.

Individual ACE categories. The most common ACE experienced in this sample was father absence. This is not surprising due to the nature of the sampling method which oversampled unwed mothers, meaning that it is likely an overrepresentation of urban youth who experience this ACE. However, this is on par with findings that parental separation or divorce is one of the most common ACEs at the national level (Sacks & Murphey, 2018). There is also a pattern that father absence increases across time. Fifty percent of all children in the United States are likely to witness divorce and this increases for children born out of wedlock (Centers for Disease Control, 2020). Estimates suggest that 78% of children born to cohabitating parents are 35% born to married parents will spend time living apart from one of their parents, usually their father, by the age of 15 (Andersson, 2002). Another estimate suggests that by the time children turn 9, more than 20% of born to a married couple and 50% of born to a cohabiting couple will have experienced the breakup of their parents, for instance (Kennedy & Bumpass, 2008).

Another pattern that stands out is that other than father absence, most of the ACE categories seem to be lowest at age 15, in line with reports that child maltreatment in particular are less likely to occur with increased age (U.S. Department of Health & Human Services, 2020). With few studies looking at proportions of ACEs separately across time like this, it is less understood why other ACEs (i.e., domestic violence, mental illness) would be lower during adolescent years compared to early and middle childhood.

After father absence, on average the next highest ACEs were psychological abuse and incarceration, patterns that were relatively consistent across time. There is considerable work showing that minoritized individuals are more likely to be incarcerated (*NAACP*, n.d.) and that this likely stems from systemic inequities and discrimination (Alexander, 2012). Other studies also report high rates of psychological abuse compared to other ACEs (Blum et al., 2019; Zhang et al., 2020) and attribute this to emotional abuse underlying or co-existing with other forms of abuse. Following those, physical abuse and substance abuse showed similar average levels that were lower than those already discussed but generally higher than the rest. There is also an interesting pattern when comparing substance abuse and incarceration, whereby both are stable at years 3 and 5 but then at year 9, incarceration drops considerably while substance abuse spikes. Then by year 15, the reverse pattern is seen where substance abuse drops and incarceration increases. Further investigation is required to understand if these patterns are linked in some way.

The lowest reported ACE was sexual abuse, which is also similar to national reports indicating that sexual abuse is the least reported child maltreatment (U.S. Department of Health & Human Services, 2020). Along with other child maltreatment questions, it is possible there was increased social desirability due to the fact that parents were asked multiple, in depth, and

sensitive questions directly by a data collector. This is in contrast to typical ACE questionnaires that are completed in a survey format and in a way that just asks yes or no without requiring details. Thus, it would not be surprising if actual rates of child maltreatment are higher than what is reported here. This would follow evidence that child maltreatment is most likely to occur in early childhood (U.S. Department of Health & Human Services, 2020), a trend not present in these results. On average, after sexual abuse, the next least common ACEs were domestic violence, mental illness, and neglect all demonstrating similar average occurrences across time. While looking at these patterns assists in understanding this sample and the methods used in this paper, the overall consensus in the field remains to examine ACEs collectively, as will be discussed next.

Understanding ACEs in Relation to Adolescent Mental Health and Well-being

Findings from this study strengthen the overarching notion that ACEs across childhood relate to mental health and well-being outcomes in adolescence. This association aligns with decades of research on ACEs.

The value of a total cumulative score**.** Ultimately, the hypothesis that greater cumulative exposure to ACEs predicts higher depression and anxiety as well as diminished well-being, in comparison to specific time periods, was supported. Measuring ACEs across time and calculating a total showed the strongest magnitude of relationship to outcomes, verified by increases in effect sizes. However, local effect sizes were small across analyses. Unfortunately, past studies that will be discussed in comparison to this work did not report on effect sizes, making comparison not possible. This suggests that accumulated exposure over time matters and is a more compelling assessment of ACEs relationship to mental health in adolescence, compared to individual time points. So even though at any given time point, most children were

not experiencing a very high number of ACEs, they are accumulating and/or changing in some way over time that makes this overall cumulative score more representative of their experiences. These findings join a growing body of work that suggests a dose-response relationship between cumulative ACEs and mental health outcomes in particular (Blum et al., 2019; Hunt et al., 2017; Schroeder et al., 2018; Zhang et al., 2020). Specifically, Blum et al. (2019) found strong relationships between high exposures to increased depressive symptoms in adolescence across 14 communities globally. Wang et al. (2019) also found incredibly strong associations between the cumulative effect of ACEs and increased odds of suicidal ideation in particular in young adulthood suggesting a 885% increase in suicidal ideation when having experienced two ACEs compared to none.

Even further, there is a mounting need to consider ACEs at multiple points across time to best capture the potential accumulation of risk. This notion aligns with previous studies that show cumulative effects of ACEs when assessed across time best predict outcomes in adolescence (Flaherty et al., 2013; Thompson et al., 2015). Results are in slight contrast to those of Schroeder et al. (2018) who showed that the highest odds of behavior problems in childhood related to intermittent rather than chronic adversity. However, their findings still speak to the importance of assessing ACEs across time. Efforts to assess ACEs from this perspective are falling in line with the broader cumulative risk theory that posits a relationship between the accumulation of multiple risk factors across childhood and poor psychological outcomes (Cohen et al., 2019; Ettekal et al., 2019; Giovanelli et al., 2019; Rutter, 1979; Savolainen et al., 2018). Broadly speaking, studies continue to relate risk accumulated over time in childhood to outcomes (e.g., externalizing problems, criminal activity, depression) in later childhood or adolescence. Information from one time period alone might not be as reflective or meaningful about a child's

or adolescent's amount of adversity exposure and has the potential to mask findings. This has implications for both research in terms of ensuring we are capturing the best ACE predictor and conclusions that are drawn from them, as well as practice, to most comprehensively understand a child's experience and how to help them.

It would be helpful to further expand on these findings by understanding what this potential accumulation looks like with more depth and specificity. While this study captured elements of dosage from a broad sense, questions remain about which and how many ACEs occurred repeatedly over time. One recommendation would be additional within child analyses to parse out stability or change in particular ACEs over time. For example, do children experience new/unique ACEs or the same type of ACE across time? For how many years did a child experience a particular ACE? What does that look like for types of ACEs? Most current ACE measurement lacks this specificity, yet gathering such descriptive information would be more precise and allow for more nuanced analyses and findings about ACE accumulation over time.

Year 9 ACEs predict outcomes, but less strongly than cumulative ACEs. While cumulative ACEs best predict adolescent functioning, if any of the individual time points contribute as well, there was support for the period just proceeding it, rather than concurrently or in early childhood. Only ACEs at year 9 produced significant associations with depression and well-being when all time points were collectively examined. Year 9 can be thought of as representing a year during middle childhood and as the most proximal precursor to outcomes. With a great deal of research suggesting that ACEs, and other challenges, in early childhood have direct and lasting impacts on adolescent functioning (Luby et al., 2017; Schalinski et al., 2016; Whalen et al., 2016), the importance of early childhood should not be discounted. While

results here are not necessarily supportive of that specific pattern, it would be concerning to claim that they are in direct conflict. With ACEs at all time points used in the same models, variance in outcomes at year 15, that ACEs from early childhood might independently predict, may actually be explained or taken up by later ACE timepoints. When Schroeder et al. (2018) did not find that chronic adversity in early childhood (years 1, 3, 5) related to year 9 behavior problems, they acknowledged that early adversity may be more strongly associated with more proximal outcomes (year 5), because associations with later problems (year 9) are actually mediated by earlier problems (year 5). This suggestion would follow a similar pattern at play here. In fact, suggesting ACE measurement across *all* of childhood supports the need to consider early childhood, just alongside later childhood and adolescence as well.

Furthermore, it is conceivable that relatively proximal ACEs could be more relevant to outcomes, compared to more distal ones. With more time passing between earlier risk and later outcomes, the more time there is for possible intervention. Much ACE research with outcomes in childhood do in fact show relationships between relatively proximal ACEs and their immediate outcomes 5/1/21 4:06:00 PM. This idea aligns with findings from a study reporting that the most proximal experience of various risks related strongest to adolescent psychopathology (Flouri & Kallis, 2007). Even still, Flouri and Kallis (2007) promoted the importance of assessing risk cumulatively across multiple time points, an important conclusion of this study as well. All in all, suggestions that there is power in more proximal predictors, does not follow why concurrent ACEs would not also predict outcomes in this study. Possibly, for some reason in this sample, effects from difficulties in the previous year have not yet had the time to fully incorporate in adolescents' reports of how they conceptualize their current functioning. With more work assessing ACEs across multiple timepoints, there is growing confirmation that individual time

points hold less power than accumulated exposure over time. In this context, all developmental periods are collectively viewed as important contributors to understanding the accumulation of ACEs over time.

High adversity predicts outcomes, but less strongly than cumulative ACEs. Following a similar pattern to year 9 ACEs, experiencing high adversity of ACEs (5 or more at given time points) did relate to adolescent functioning, but with cumulative ACEs still emerging as the most predictive, again when considering effect size. Additionally, when high adversity ACEs are in a model with the total cumulative ACEs, the effects of high adversity were no longer significant. Findings were significant, even with the lack of variability in this variable, although it could also be a contributor to why they were not strong enough to hold up. Nonetheless, when considered separately, hypotheses were supported, such that more consistent exposure to high levels of ACEs related to worse depressive symptoms and less positive functioning. Again, this makes sense and relates to what is known about both ACEs and cumulative risk (Blum et al., 2019; Hunt et al., 2017; Schroeder et al., 2018; Zhang et al., 2020). Findings from this study also further advise for the use of a continuous measure of cumulative risk (cumulative ACEs) rather than a threshold cut off. To conclude, inspecting associations from individual time points or cutoffs of high adversity of ACEs are less meaningful given the stronger associations with the total cumulative score.

Social Support Contributing to Better Mental Health and Well-being, Regardless of ACEs

Final models incorporated social support characteristics alongside cumulative ACEs in predicting mental health outcomes. Results provide evidence that various contexts of social support had consistently positive, direct contributions to explaining adolescent mental health symptoms and well-being. Main effects suggested that multiple forms of social support mattered

for the perceived mental health and well-being of *all* adolescents. More specifically, higher social support from relationships with caregivers, connectedness with school, and collective efficacy within neighborhoods all strongly predicted fewer depressive and anxiety symptoms and better well-being. It is encouraging to report that, commensurate with other research, concurrent support from caregivers, schools, and neighborhoods relates to these outcomes (Armstrong et al., 2005; Foster et al., 2017; Ann S. Masten, 2019; Ronen et al., 2016; Rueger et al., 2016; Sege et al., 2017; Southwick et al., 2016; K. Wang et al., 2020). Additionally, effect sizes suggest "medium" effects for caregiver and school support relating to depression and positive functioning. Even further, this positive contribution of social supports holds true in a large sample of urban youth coming from diverse and relatively disadvantaged backgrounds. Informed by the social determinants of health framework, another recent study using the FFCWB dataset found relationships between adolescents' social environment and a self-rated assessment of overall physical health (Wang et al., 2020). Similar to the current study, Wang and colleagues (2020) found evidence of this association independently for multiple aspects of adolescents' social environment, including relationships with parents, peers, school climate, and neighborhood collective efficacy. Researchers concluded that adolescence was a time particularly sensitive to these proximal social environments related to health perceptions. As such, the current study extends findings of similar social contexts relating to mental health outcomes as well.

Across all models including social support characteristics, main effects of total cumulative ACEs held up when predicting adolescent depression and positive functioning. However, the main effects of social support consistently had stronger associations with positive mental health than these cumulative ACEs. Given that social support and outcome variables are

all reported by adolescents, it is important to acknowledge that common method variance might have played a role in the strength of associations.

Limited findings for moderation effects of social support. Further, associations between social support and mental health were generally not found to be conditional on ACEs, as moderation effects were limited to only one instance. This was contrary to hypotheses that predicted a moderating role, such that social support would actually reduce the relationship between ACEs and poor functioning and provide a protective effect. In light of a lack of moderation findings, a positive message to focus on is that concurrent perceived social supports may be more highly associated with adolescent mental health than the effects of adversity over time. The one interaction effect that emerged showed school connectedness moderating the relationship between ACEs and anxiety. The main effect of school connectedness remained, suggesting the existence of an overall positive relationship, but that it was stronger under certain conditions. The patterns suggested that adolescents who experienced high ACEs actually reported higher anxiety when they also reported moderate and high levels of school connectedness, compared to when they reported low levels of school connectedness. In other words, for those who experienced higher ACEs and reported higher anxiety, they were also more likely to report feeling more connected at school. It might be that adolescents who experienced high ACEs and thus reported higher anxiety, might actually more heavily rely on social support in school and thus report feeling more connected. However, it is important to be cautious in overinterpreting this finding for multiple reasons. It was the only significant interaction out of nine that were possible and the simple slope analyses were not significant. Additionally, the direction of the effect is not in line with predictions or previous research about the relationships between these constructs.

Overall, models testing for relationships with anxiety showed a different pattern than the other two outcomes. ACEs consistently showed the least strong relationship with anxiety. Anxiety was also the only outcome that showed a moderation effect, and one that did not make much theoretical sense. Following the literature, we would expect ACEs to relate to anxiety. This brings into question what "anxiety" in this study captured. The questions used in this study were only a subset of questions from a larger validated anxiety questionnaire. Thus, it is possible that the limited number of questions selected did not capture symptoms that would follow experiencing ACEs, which could limit findings. The relationship between ACEs and anxiety should be further explored with more comprehensive measures of anxiety and in a sample with increased variability in anxiety symptomology.

Lack of moderation findings overall imply that social support examined in this study, while beneficial to overall mental health and well-being in adolescence, may not have served as a protective factor for ACEs. One explanation is that the adolescents in this sample are experiencing enough risk that the social supports are not robust to buffer the effects from ACEs. Maybe social supports best mitigate the detrimental effects of ACEs in samples of less high-risk adolescents. These findings could also be due to methodological shortcomings. One review, about psychological research very broadly, notes that finding statistically significant moderator effects, particularly after variance from main effects is explained, can be difficult (McClelland & Judd, 1993). Specific to the current study, it could be that social supports would need to be measured earlier than just concurrently at year 15. Adolescents only reporting on current supports fails to consider what supports from earlier years may have looked like. As such, it could be useful to have multiple measurements throughout childhood or adolescence that reflect consistency of supports over multiple years. Even when just considering concurrent

measurement, given the possibility of acute difficulties in relationships (e.g., a recent disagreement), it would also be helpful if questions asked adolescents to reflect on a longer time period than just the past month. Additionally, other moderators might not have been accounted for. This could include additional types of social support, such as peer relationships or other adults beyond parents and parents' partners. Social support can come from other family members, coaches, extracurricular team activities, or even peers' families. Broader questions asking about other supportive adults in an adolescent's life, rather than asking about specific people in defined roles (i.e., a parent), may better capture perceived support. This could be reflected in different ways of operationalizing social support or, at the very least, a more comprehensive assessment approach that might allow examination of multiple types of social support independently and collectively.

Aligned with current findings, classic work on moderation found support across multiple studies for main effects without moderation, describing that social support can be beneficial to well-being but not necessarily helpful in the face of stress (Cohen & Wills, 1985). Cohen & Wills (1985) further explain that measuring specific attributions about oneself (e.g., self-esteem, hope) as well as perceived availability of support could aid in the detection of moderation effects (Cohen & Wills, 1985). More recent work addressing clinically significant trauma psychopathology outcomes in adolescents showed self-reported intrinsic perceptions of resilience as a buffering response to ACEs (Goldenson et al., 2020). This resilience measure captured individual, relational, communal, and cultural resources that youth see as available in their lives. Findings from Cohen and Wills (1985) and Goldenson (2020) highlight the difference in their moderators versus what was tested in the current study. Here, adolescents did not respond to questions about internal or personality based qualities of themselves nor about

perceptions of available resources. Instead, they rated how much they agreed or disagreed with statements related to closeness in current social contexts. Future work assessing for protective factors from ACEs, and specifically for those with high levels of ACEs or who are from disadvantaged backgrounds, should consider both broadening and deepening the assessment of social support.

Practical Implications using System-Level Approaches

The present investigation contributes to a growing body of work suggesting the need to address concerns around ACEs and, independently, that support within families, schools, and neighborhoods promote adolescent well-being. In response to a widely acknowledged article cautioning screening of ACEs (Finkelhor, 2018), Dube (2018) uses a public health lens to say that "In the case of ACEs, the real threat is not taking action, given the known short-term and long-term consequences of childhood trauma." From their work supporting proximal social supports, Liu and colleagues (2020) stated that, "programs should simultaneously assess for and address protective factors, including both within-child characteristics and contextual factors such as family and community characteristics" and "because of the interaction between individuals, families, communities, and the larger sociopolitical environment, ideal prevention and intervention approaches related to ACEs will encompass all socioecological levels" (Liu et al., 2020). As such, implications from this work are two-fold. One, continuing efforts to reduce ACE exposure (prevention) and two, bolstering interventions that demonstrate the capacity to develop and enrich various social supports. For both aspects, there is a call for broad systemic intervention and community-based efforts (Kia-Keating et al., 2017; Liu et al., 2020), as initiatives enacting supports at multiple levels have the potential for the most wide-reaching impacts.

When focusing on racially/ethnically diverse and urban youth, there is a crucial need to work from and towards a social justice and equity-focused approach. Youth from underrepresented backgrounds continue to experience inequities due to long-standing racist policies and practices that affect them at home, at school, and in their neighborhoods. Acknowledging this, Liu et al. (2020) report that "efforts to improve child health and racial/ethnic disparities in research and practice must consider adversity, protective factors, and the systemic inequities faced by racial/ethnic minority youth in the United States." Today in America, youth of color are disproportionally exposed to more ACEs and are more likely to experience negative outcomes because of them (McDonald et al., 1997; Mcdonald et al., 2015). Unfortunately, it has taken a global pandemic to shine a brighter light on these inequities. A recent article published in the *New York Times* by Dr. Mona Hanna-Attisha (2020), a pediatrician from Michigan State University's College of Human Medicine, underscores the need for community-level, systems change to address these inequities – "This is how we begin to transform the concept of resilience from an individual trait to one that describes a community — and society — that cares for everyone. Rather than hoping a child is tough enough to endure the insurmountable, we must build resilient places — healthier, safer, more nurturing and just — where all children can thrive. This is where prevention and healing begin."

When implementing community-based initiatives in the most effective manner, efforts are best spent building off of what is already in place. Over the past decade or so large organizations such as Substance Abuse Mental Health Services Administration (SAMHSA), the National Center for Trauma-Informed Care, and The National Child Traumatic Stress Network, have released specific information regarding trauma-informed care. Resources for prevention and intervention efforts are available at individual, family, practitioner, school, and community

levels. As an example, in 2014, SAMHSA released Tip 57: Trauma-Informed Care In Behavioral Health as well as their Concept of Trauma and Guidance for a Trauma-Informed Approach for a wide array of systems (Substance Abuse and Mental Health Services Administration, 2014; 2014). Initiatives from organizations like these has led to a multitude of examples at state levels that have begun to implement policies and initiatives to prevent ACEs and intervene due to consequences. This follows researchers continuing to suggest that collaborative and trauma-informed services are needed (Hughes et al., 2017; Wang et al., 2019). There are frameworks such as Community-Based Participatory Research (CBPR) that focus on incorporating community voices (e.g., practitioners, key stakeholders, youth, parents) into research showing positive outcomes particularly around health disparities (Kia-Keating et al., 2017; Wallerstein & Duran, 2006). The Nurse-Family Partnership is another well-known and extensively researched example of a community-based health program aimed at facilitating positive parents-child relationships and reducing child abuse and neglect (Olds et al., 1986, 1997).

Additionally, if we know adolescents can holistically benefit from supports, how can we best reach them? Schools have the potential to encompass and impact all levels of support addressed in this study and remain a prime structure for intervention due to their unique nature to reach all children, and provide access to their families and surrounding communities. In addition to schools' wide-reaching nature, relationships with school connectedness also showed up as the most strongly related to outcomes and some of the largest effect sizes. As such, better understanding comprehensive school-based initiatives along with research assessing them is warranted. Related to school connectedness in particular, the CDC has a guide called "School Connectedness: Strategies for Increasing Protective Factors Among Youth" for teachers, administrators, other school staff, and parents (Centers for Disease Control and Prevention,

2009). Along with school- and classroom-based recommendations, this guide aims to help schools promote student, family, and community engagement. An example of a widely-used, evidence-based model that focuses on building successful and connected schools is Positive Behavioral Interventions and Supports (PBIS; Horner et al., 2010). PBIS aims to build positive school cultures and many times also encourages School-Family partnerships. There are specific efforts to promote PBIS and other evidence-based practices into urban schools in particular (McGoey & Graves Jr., 2016). Another common approach for school-wide, evidence-based practices that reach families is suicide prevention. The SOS Signs of Suicide program is one example for both middle and high schools that engages teachers, school staff, and students, as well as viewing parents and community members as "partners in prevention" (Schilling et al., 2016).

More explicit in incorporating multiple contexts, is an example typically adopted by early childhood education systems called Strengthening Families (Harper Browne, 2014). This is a research-based approach from The Center for the Study of Social Policy (CSSP) that has worked with over 30 states to implement such a framework. Goals include striving to engage families, programs, and communities in building key protective factors (parental resilience, social connection, parenting knowledge, support in times of need, social and emotional competence of children). Built off of this same framework is FAST (Families & Schools Together), an evidence-based family engagement program (McDonald et al., 1997; Mcdonald et al., 2015). This program also aims to build protective factors and main outcomes include, child attachment and interpersonal bonds, the family unit, parent-to-parent social networks and supports, parent empowerment and self-efficacy, connections to school personnel, and connections to community

resources. Investing in efforts such as these are promising ways to foster positive child and adolescent psychological functioning through engagement across multiple contexts.

Limitations and Recommendations for Future Research

The current study is not without limitations and there are ways future studies can improve on shortcomings. Although these findings represent one of the only existing examinations of ACEs from birth through adolescence in a low-income, racially/ethnically diverse urban sample, they cannot be considered nationally representative because, as discussed, weights were not used in analyses. However, weights for this study were not created for longitudinal analysis. Therefore, most prior work over time instead uses covariates to account for the sampling design. This approach was used to ensure comparability of findings with other longitudinal analyses of ACEs in this sample. Regardless of weights, results using this sample are also not necessarily generalizable to populations outside of urban areas, such as rural youth. Aspects unique to rural communities influence family life, schools, and neighborhoods very differently when compared to urban areas and thus relationships examined in this study may operate differently. Future studies should examine ACEs in other samples, such as children from rural communities. Furthermore, in order to have adequate survey data across five time points, a large number of families had to be excluded from analyses, typical of longitudinal work using FFCWB. Sensitivity analyses were run comparing samples and differences emerged that were also in line with other studies using subpopulations from FFCWB. Nonetheless, the final analytic sample captures families that were less diverse and less disadvantaged than what might be typical of urban families meaning that results may underrepresent what even more disadvantaged adolescents experience.

The most robust way to handle missing data and retain as many cases as possible to ensure generalizability of results, would be to use multiple imputation (MI) methods. The multitude of yes/no items and lack of variability hindered convergence of MI. However, FIML was chosen as a secondary missing data approach that has strong support in the literature. Several other conservative methodological approaches (robust standard errors, Benjamini-Hochberg corrections, and various sensitivity analyses) were applied to increase the rigor of analyses. Nonetheless, it would be useful to explore other missing data approaches with these data to compare results.

While not anticipating the need to account for nesting based on previous work with this dataset, testing for the potential of city-level effects was not possible. Data on city classification was not available in the public use files. Therefore, no adjustments for potential nesting were used. Additionally, it is atypical for work using this dataset to address potential effects using multilevel modeling, though there are interesting possibilities that could address the hierarchical nature of children within particular contexts such as those explored in this paper (schools, communities, cities).

Adolescent-reported depression and anxiety did not provide complete information from fully validated measures and therefore did not allow for identifying clinical thresholds or classification. Thus, it is difficult to know what the clinical significance of high ratings of these symptoms are. There are also other symptoms of both depression and anxiety that were not captured. The use of well-validated measures of psychological functioning that can represent clinical significance would be worthwhile in future studies. Additionally, results were skewed such that adolescents were more likely to report lower levels of both depressive and anxious

symptomology and higher levels of positive functioning. Capturing a sample with greater variation in these outcomes could allow for more explanatory power.

Questions assessing for social support variables could also be expanded. For example, caregiver relationships were only asked about the adolescents' mother, father, mother partner, and father partner. There are clearly other potential caregivers figures (e.g., grandparent) or even adults in adolescents' lives (e.g., mentor) that they could have a stronger relationship with than what they were asked to report on. A measure of positive peer relationship was also not available and thus an area for additional exploration as a social support moderator given the general understanding of the importance of peers in adolescents lives. However, the current study aimed to follow literature suggesting the upmost importance of supportive adults, compared to peers, particularly for vulnerable youth (Foster et al., 2017; Rueger et al., 2016). Further, mental health, well-being, and social support variables were assessed concurrently, limiting interpretations about the directionality of findings. When assessed in this way, only social support in the past month of an adolescent's life was captured, which may not account for what relates to outcomes. Concurrent assessment also limits interpretations of directionality. Thus, it would be difficult to state that social support is the driver of reduced mental health outcomes. The interplay of all three social support factors was also not explored. There could be additional combined positive effects from experiencing multiple types of social support together. Further, earlier measures of mental health and wellbeing were not available so models did not account for "baseline" outcomes. This means that changes in outcomes were not predicted. Thus, there is a need to examine similar longitudinal questions in data sets that could track changes in mental health outcomes over time (rather than just ACEs). Similarly, although this work used data points across childhood to reflect ACEs, models did not look at changes in ACEs over time or true

longitudinal models. Future directions could include growth modeling of ACEs and further, the possibility of using variation around the slope to predict later outcomes.

With work also highlighting externalizing disorders (e.g., Attention Deficit Hyperactivity Disorder; delinquency) and learning challenges (e.g., specific learning disorders, school achievement) as consequences of toxic stress and ACEs, expanding outcomes to include these concerns are suitable avenues for further exploration. Additionally, potential overlap of externalizing symptoms (e.g., impulsivity) with internalizing symptoms (e.g., depression or suicidal ideation) could isolate a particularly high-risk group for suicide attempts that would also be worth examining.

As discussed, measuring ACEs without the traditional ACE questionnaire has drawbacks. One of these includes difficulty in comparison to other studies. While using questions that do not directly ask about ACEs could lead to more accurate reporting, there is more inference involved in capturing the true presence or absence of an ACE. For example, child physical abuse questions asked whether mothers and/or fathers hit their children and with what frequency. Extrapolations were then made based on percentiles to determine if it met a threshold for physical abuse. Along similar lines, there was variability in how many questions were used to assess for ACEs, and there were differences in questions for the same category of ACE overtime. All of these could have led to inconsistencies and either under or over reporting of specific ACEs. However, a strength of this study is that using this other qualitative information allowed for measurement of ACEs at multiple time points. In addition, constructing ACEs this way was replicated from previously published work with this dataset (Hunt et al., 2017; Jimenez et al., 2016, 2017; Reichman et al., 2018; Schroeder et al., 2018). As is true for almost all research on ACEs, responses were reported retrospectively by parents. This comes with a few caveats.

Parents might underreport due to not remembering certain events, not being present for certain events and thus not knowing about them, and due to social desirability as these are sensitive topics. A strength is that parents were only asked to report on the past few months or year rather than many years, as is typical of ACE measurement. Additionally, especially by year 15, adolescent perspectives on their experience of ACEs might differ from their parents, especially for more subjective ACEs such as neglect or psychological abuse. Finally, there is not a consensus within the literature about what situations should always be considered an ACE. There are additional circumstances not captured in this study (e.g., poverty, parental death, racism). Categories were chosen in this study to most closely mirror the original ACEs reported from the leading ACE study as well as studies using the FFCWB data (Felitti et al., 1998; Reichman et al., 2018).

Because this study did not identify whether ACE scores across years represented the same or different ACEs, more nuanced examination of this could elucidate understanding around dosage. There is also the potential for more to be learned about resilience in the face of ACEs, as it relates to mental health outcomes, by comparing youth within groups of low and medium to those of higher risk (such as those in this study). It is possible that social support (or other factors) only act as protective factors for youth who have experienced lower amounts of ACEs. Along similar lines, exploring additional outcomes, such as those that capture externalizing disorders, has the potential to reveal additional relationships to ACEs.

Finally, there are two remaining considerations common to this type of work. Related to omitted variable bias, it is likely that additional variables related to outcomes were not included in analyses (e.g., racial based discrimination, self-esteem, mental illness diagnosis). Lastly, regression analyses are only correlational in nature and thus causal inferences cannot be made.

Further prospective designs or experimental work would be needed to test the validity of claims suggested by the relationships from this study. Experimental designs could randomly assign children to social support interventions based on reported ACE scores to determine whether social supports are more beneficial for children/adolescents with high ACEs. Recent studies have also used latent class analysis as a way to identify more specific patterns and clusters of ACEs that predict outcomes as a way to better inform interventions (Blum et al., 2019; Zhang et al., 2020).

Conclusion

This work joins an influx of research that has acknowledged the paucity of findings related to ACEs in adolescence specifically and gives credence to this time period (e.g., Blum et al., 2019). As was expected, cumulative ACEs are contributing to a growing mental health crisis among urban adolescents. At the same time, supportive caregivers, schools, and neighborhoods are showing positive associations to better mental health functioning. Ultimately, there remains hope to construct a society that sees fewer adolescents struggling with mental illness. There is accumulating evidence from this study and other work in diverse, high-need communities (e.g., Kia-Keating et al., 2017; Liu et al., 2020) to support the notion that we ought to surround all children and adolescents in multiple supportive circles at familial and community levels. The more opportunities for connection that are created, the more opportunity for resilience.

Moreover, there is encouraging evidence that relationships between social support and mental health may be stronger than the negative links to ACEs. It is also promising that these positive influences were found for a group of high risk adolescents who have experienced a range of ACEs. However, there was no evidence to suggest that social support factors lessen the effects that ACEs have on mental health. In other words, this study did not show that they serve

as a buffer against ACEs. So while some adolescents living in supportive contexts might get what they need for optimal mental health functioning, those who are more at risk (i.e., experience a lot of ACEs) may still not fare as well. As such, a preventative focus on children who have experienced high levels of adversity is still needed. For some children, adolescents, and adults alike, these experiences contribute to mental health symptomatology that require targeted individual intervention (Cohen & Wills, 1985). School and community-based initiatives working from a trauma-informed lens and mental health centers that deliver evidence-based treatment for trauma are crucial. This important work cannot be ignored, though at the same time, there is a shortage of mental health practitioners as well as barriers to access care (Butryn et al., 2017; Mink, 2019; So et al., 2019). Therefore, we must also ask ourselves if there are ways to take a more systemic, preventative approach that reduces the reliance on these services at a societal level.

Now is the time for adults across multiple contexts to organize and show up for each other's children. Whether it be a grandmother for their grandchild, a teacher for their student, or postal worker for a child on their route. Alongside this, pediatricians, psychologists, counselors, school administrators, and policy makers should work together to critically analyze the needs of their communities as a way to ensure we raise children from all backgrounds with the capacity for optimal health, mental health, and well-being.

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References

Ackard, D. M., Neumark-Sztainer, D., Story, M., & Perry, C. (2006). Parent–child connectedness and behavioral and emotional health among adolescents. *American Journal of Preventive Medicine*, *30*(1), 59–66. https://doi.org/10.1016/j.amepre.2005.09.013

Alexander, M. (2012). *The New Jim Crow: Mass Incarceration in the Age of Colorblindness*. United Kingdom: The New Press.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. Washington, DC, US: American Psychiatric Association Publishing.

American Psychological Association. (2018). APA dictionary of psychology. Retrieved August 15, 2019, from https://dictionary.apa.org/externalizing-internalizing

Andersen, S. L., Tomada, A., Vincow, E. S., Valente, E., Polcari, A., & Teicher, M. H. (2008). Preliminary evidence for sensitive periods in the effect of childhood sexual abuse on regional brain development. *The Journal of Neuropsychiatry and Clinical Neurosciences*, *20*(3), 292–301. https://doi.org/10.1176/jnp.2008.20.3.292

Anderson Moore, K., Murphey, D., Beltz, M., Carver Martin, M., Bartlett, J., & Caal, S. (2016). Child well-being: Constructs to measure child well-being and risk and protective factors that affect the development of young children. Retrieved August 25, 2019, from Child Trends website: https://www.childtrends.org/publications/child-well-constructs-measure-child-well-risk-protective-factors-affect-development-young-children

Andersson, G. (2002). Children's experience of family disruption and family formation: Evidence from 16 FFS countries. *Demographic Research*, *7*, 343–364. https://doi.org/10.4054/DemRes.2002.7.7

Arain, M., Haque, M., Johal, L., Mathur, P., Nel, W., Rais, A., … Sharma, S. (2013). Maturation of the adolescent brain. *Neuropsychiatric Disease and Treatment*, *9*, 449–461. https://doi.org/10.2147/NDT.S39776

Armstrong, M. I., Birnie-Lefcovitch, S., & Ungar, M. T. (2005). Pathways between social support, family wellbeing, quality of parenting, and child resilience: What we know. *Journal of Child and Family Studies*, *14*(2), 269–281. https://doi.org/10.1007/s10826-005-5054-4

Balistreri, K. S., & Alvira-Hammond, M. (2016). Adverse childhood experiences, family functioning and adolescent health and emotional well-being. *Public Health*, *132*, 72–78. https://doi.org/10.1016/j.puhe.2015.10.034

Barber, B. K., Stolz, H. E., & Olsen, J. A. (2005). Parental support, psychological control, and behavioral control: Assessing relevance across time, culture, and method. *Monographs of the Society for Research in Child Development*, *70*(4), 1–137. https://doi.org/10.1111/j.1540-5834.2005.00365.x

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society Series B Methodological*, 57(1), 289–300.

Bethell, C. D., Carle, A., Hudziak, J., Gombojav, N., Powers, K., Wade, R., & Braveman, P. (2017). Methods to assess adverse childhood experiences of children and families: Toward approaches to promote child well-being in policy and practice. *Academic Pediatrics*, *17*(7), 51–69. https://doi.org/10.1016/j.acap.2017.04.161

Bethell, C. D., Newacheck, P., Hawes, E., & Halfon, N. (2014). Adverse childhood experiences: Assessing the impact on health and school engagement and the mitigating role of

resilience. *Health Affairs (Project Hope)*, *33*(12), 2106–2115. https://doi.org/10.1377/hlthaff.2014.0914

Bethell, CD, Davis, MB, Gombojav, N, Stumbo, S, Powers, K. Issue Brief: Adverse Childhood Experiences Among US Children, Child and Adolescent Health Measurement Initiative, Johns Hopkins Bloomberg School of Public Health, October 2017: cahmi.org/projects/adverse-childhood-experiences-aces

Björkenstam, E., Hjern, A., Mittendorfer-Rutz, E., Vinnerljung, B., Hallqvist, J., & Ljung, R. (2013). Multi-exposure and clustering of adverse childhood experiences, socioeconomic differences and psychotropic medication in young adults. *PloS One*, *8*(1), e53551. https://doi.org/10.1371/journal.pone.0053551

Blader, J. C. (2011). Acute inpatient care for psychiatric disorders in the united states, 1996 through 2007. *JAMA Psychiatry*, *68*(12), 1276–1283. https://doi.org/10.1001/archgenpsychiatry.2011.84

Blader, J. C. (2011). Acute inpatient care for psychiatric disorders in the united states, 1996 through 2007. *JAMA Psychiatry*, *68*(12), 1276–1283. https://doi.org/10.1001/archgenpsychiatry.2011.84

Blum, R. W., Li, M., & Naranjo-Rivera, G. (2019). Measuring adverse child experiences among young adolescents globally: relationships with depressive symptoms and violence Perpetration. *The Journal of Adolescent Health*, *65*(1), 86–93. https://doi.org/10.1016/j.jadohealth.2019.01.020

Bond, L., Butler, H., Thomas, L., Carlin, J., Glover, S., Bowes, G., & Patton, G. (2007). Social and school connectedness in early secondary school as predictors of late teenage

substance use, mental health, and academic outcomes. *Journal of Adolescent Health*, *40*(4), 357.e9-357.e18. https://doi.org/10.1016/j.jadohealth.2006.10.013

Bronfenbrenner, U. (1979). Contexts of child rearing: Problems and prospects. *American Psychologist, 34*(10), 844-850. doi:10.1037/0003-066X.34.10.844

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner W. Damon (Ed.), (pp. 793-828). Hoboken, NJ, US: John Wiley & Sons Inc.

Browning, C. R., & Cagney, K. A. (2002). Neighborhood structural disadvantage, collective efficacy, and self-rated physical health in an urban setting. *Journal of Health and Social Behavior*, *43*(4), 383–399.

Browning, C. R., Burrington, L. A., Leventhal, T., & Brooks-Gunn, J. (2008). Neighborhood structural inequality, collective efficacy, and sexual risk behavior among urban youth. *Journal of Health and Social Behavior*, *49*(3), 269–285. https://doi.org/10.1177/002214650804900303

Butryn, T., Leah, L., Marchionni, C., & Sholevar, F. (2017). The shortage of psychiatrists and other mental health providers: Causes, current state, and potential solutions. *International Journal of Academic Medicine. 3*(1), 5–9.

Casey, B. J., Jones, R. M., Levita, L., Libby, V., Pattwell, S. S., Ruberry, E. J., … Somerville, L. H. (2010). The storm and stress of adolescence: Insights from human imaging and mouse genetics. *Developmental Psychobiology*, *52*(3), 225–235. https://doi.org/10.1002/dev.20447

Center on the Developing Child. (2007). The impact of early adversity on children's development. Retrieved July 19, 2019, from www.developingchild.harvard.edu

Centers for Disease Control and Prevention. (2019). WISQARS leading causes of death reports. Retrieved July 29, 2019, from https://webappa.cdc.gov/sasweb/ncipc/leadcause.html

Centers for Disease Control and Prevention. *School Connectedness: Strategies for Increasing Protective Factors Among Youth.* Atlanta, GA: U.S. Department of Health and Human Services; 2009.

Centers for Disease Control. (2020, April 3). *Improving Access to Children's Mental Health Care | CDC*. Centers for Disease Control and Prevention. https://www.cdc.gov/childrensmentalhealth/access.html

Centers for Disease Control. (2020, May 5). *National Center for Health Statistics*. Marriage and Divorce. https://www.cdc.gov/nchs/fastats/marriage-divorce.htm

Chartier, M. J., Walker, J. R., & Naimark, B. (2010). Separate and cumulative effects of adverse childhood experiences in predicting adult health and health care utilization. *Child Abuse & Neglect*, *34*(6), 454–464. https://doi.org/10.1016/j.chiabu.2009.09.020

Child Mind Institute. (2015). Children's mental health report. Retrieved August 15, 2019, from Speak Up For Kids Mental Health Report website: https://childmind.org/

Cohen, J. R., Thomsen, K. N., Racioppi, A., Ballespi, S., Sheinbaum, T., Kwapil, T. R., & Barrantes-Vidal, N. (2019). Emerging adulthood and prospective depression: a simultaneous test of cumulative risk theories. *Journal of Youth and Adolescence*, *48*(7), 1353–1364. https://doi.org/10.1007/s10964-019-01017-y

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Colver, A., & Longwell, S. (2013). New understanding of adolescent brain development: Relevance to transitional healthcare for young people with long term conditions. *Archives*

of Disease in Childhood, *98*(11), 902–907. https://doi.org/10.1136/archdischild-2013-303945

Copeland, W. E., Shanahan, L., Davis, M., Burns, B. J., Angold, A., & Costello, E. J. (2015). Increase in untreated cases of psychiatric disorders during the transition to adulthood. *Psychiatric Services*, *66*(4), 397–403. https://doi.org/10.1176/appi.ps.201300541

Corrigan, P. (2004). How stigma interferes with mental health care. *American Psychologist*, *59*(7), 614–625. https://doi.org/10.1037/0003-066X.59.7.614

Costello, E. J., He, J., Sampson, N. A., Kessler, R. C., & Merikangas, K. R. (2014). Services for adolescents with psychiatric disorders: 12-month data from the national comorbidity survey–adolescent. *Psychiatric Services*, *65*(3), 359–366. https://doi.org/10.1176/appi.ps.201100518

Dahl, R. E. (2004). Adolescent brain development: A period of vulnerabilities and opportunities. Keynote address. *Annals of the New York Academy of Sciences*, *1021*(1), 1–22. https://doi.org/10.1196/annals.1308.001

Derogatis, L. R., & Savitz, K. L. (2000). The SCL–90–R and brief symptom inventory (BSI) in primary care. In *Handbook of psychological assessment in primary care settings* (pp. 297–334). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Donnelly, L., McLanahan, S., Brooks-Gunn, J., Garfinkel, I., Wagner, B. G., Jacobsen, W. C., … Gaydosh, L. (2016). Cohesive neighborhoods where social expectations are shared may have positive impact on adolescent mental health. *Health Affairs (Project Hope)*, *35*(11), 2083–2091. https://doi.org/10.1377/hlthaff.2016.0721

Dube, S. R. (2018). Continuing conversations about adverse childhood experiences (ACEs) screening: A public health perspective. *Child Abuse & Neglect*, *85*, 180–184. https://doi.org/10.1016/j.chiabu.2018.03.007

Duke, N. N., & Borowsky, I. W. (2018). Health status of adolescents reporting experiences of adversity. *Global Pediatric Health*, *5*, 1–11. https://doi.org/10.1177/2333794X18769555

Dumouchel, W. H., & Duncan, G. J. (1983). Using sample survey weights in multiple regression analyses of stratified samples. *Journal of the American Statistical Association*, *78*(383), 535–543. https://doi.org/10.1080/01621459.1983.10478006

Dym Bartlett, J. (2019). Adverse childhood experiences are different than child trauma, and it's critical to understand why. Retrieved July 30, 2019, from Child Trends website: https://www.childtrends.org/adverse-childhood-experiences-different-than-child-trauma-critical-to-understand-why

Eisman, A. B., Stoddard, S. A., Heinze, J., Caldwell, C. H., & Zimmerman, M. A. (2015). Depressive symptoms, social support and violence exposure among urban youth: A longitudinal study of resilience. *Developmental Psychology*, *51*(9), 1307–1316. https://doi.org/10.1037/a0039501

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science*, *196*(4286), 129–136. https://doi.org/10.1126/science.847460

Erikson, E. H. (1964). *Childhood and society, 2nd ed*. Oxford, England: W. W. Norton.

Erikson, E. H. (1968). *Identity: Youth and crisis*. New York, NY, US: W. W. Norton

Ettekal, I., Eiden, R. D., Nickerson, A. B., & Schuetze, P. (2019). Comparing alternative methods of measuring cumulative risk based on multiple risk indicators: Are there

differential effects on children's externalizing problems? *PLoS ONE*, *14*(7). https://doi.org/10.1371/journal.pone.0219134

Fagan, A. A., Wright, E. M., & Pinchevsky, G. M. (2014). The protective effects of neighborhood collective efficacy on adolescent substance use and violence following exposure to violence. *Journal of Youth and Adolescence*, *43*(9), 1498–1512. https://doi.org/10.1007/s10964-013-0049-8

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., … Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*(4), 245–258.

Finkelhor, D. (2018). Screening for adverse childhood experiences (ACEs): Cautions and suggestions. *Child Abuse & Neglect*, *85*, 174–179. https://doi.org/10.1016/j.chiabu.2017.07.016

Flaherty, E. G., Thompson, R., Dubowitz, H., Harvey, E. M., English, D. J., Proctor, L. J., & Runyan, D. K. (2013). Adverse childhood experiences and child health in early adolescence. *JAMA Pediatrics*, *167*(7), 622–629. https://doi.org/10.1001/jamapediatrics.2013.22

Flouri, E., & Kallis, C. (2007). Adverse life events and psychopathology and prosocial behavior in late adolescence: Testing the timing, specificity, accumulation, gradient, and moderation of contextual risk. *Journal of the American Academy of Child and Adolescent Psychiatry*, *46*(12), 1651–1659. https://doi.org/10.1097/chi.0b013e318156a81a

Foster, C. E., Horwitz, A., Thomas, A., Opperman, K., Gipson, P., Burnside, A., … King, C. A. (2017). Connectedness to family, school, peers, and community in socially vulnerable

adolescents. *Children and Youth Services Review*, *81*, 321–331. https://doi.org/10.1016/j.childyouth.2017.08.011

Fragile Families and Child Wellbeing Study. (2008). *Public Data Documentation.* https://fragilefamilies.princeton.edu/data-and-documentation/public-data-documentation

Garner, A., & Shonkoff, J. (2012). Early childhood adversity, toxic stress, and the role of the pediatrician: Translating developmental science into lifelong health. *Pediatrics*, *129*(1), 224–231. https://doi.org/10.1542/peds.2011-2662

Ghandour, R. M., Sherman, L. J., Vladutiu, C. J., Ali, M. M., Lynch, S. E., Bitsko, R. H., & Blumberg, S. J. (2019). Prevalence and treatment of depression, anxiety, and conduct problems in US children. *The Journal of Pediatrics*, *206*, 256–267. https://doi.org/10.1016/j.jpeds.2018.09.021

Giovanelli, A., Mondi, C. F., Reynolds, A. J., & Ou, S.-R. (2019). Adverse childhood experiences: Mechanisms of risk and resilience in a longitudinal urban cohort. *Development and Psychopathology*, 1–22. https://doi.org/10.1017/S095457941900138X

Goldenson, J., Kitollari, I., & Lehman, F. (2020). The relationship between ACEs, trauma-related psychopathology and resilience in vulnerable youth: implications for screening and treatment. *Journal of Child & Adolescent Trauma*. https://doi.org/10.1007/s40653-020-00308-y

Hanna-Attisha, M. (2020). Opinion | I'm Sick of Asking the Children of Flint to Be Resilient—The New York Times. *New York Times*. https://www.nytimes.com/2020/05/12/opinion/sunday/flint-inequality-race-coronavirus.html

Harper Browne, C. (2014). The Strengthening Families Approach and Protective Factors Framework: Branching out and reaching deeper. Washington, DC: Center for the Study of Social Policy.

Hayes, A. F. (2006). A primer on multilevel modeling. *Human Communication Research*, *32*(4), 385–410. https://doi.org/10.1111/j.1468-2958.2006.00281.x

Health Resources and Services Administration (2016). *The National Survey of Children's Health* (2016 public use files) [Data Set]. Census Bureau. https://www.census.gov/programs-surveys/nsch/data/nsch2016.html

Horner, R. H., Sugai, G., & Anderson, C. M. (2010). Examining the evidence base for school-wide positive behavior support. *Focus on Exceptional Children*, 16.

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., … Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *The Lancet Public Health*, *2*(8), 356–366. https://doi.org/10.1016/S2468-2667(17)30118-4

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *The Lancet Public Health*, *2*(8), 356–366. https://doi.org/10.1016/S2468-2667(17)30118-4

Hunt, T. K. A., Slack, K. S., & Berger, L. M. (2017). Adverse childhood experiences and behavioral problems in middle childhood. *Child Abuse & Neglect*, *67*, 391–402. https://doi.org/10.1016/j.chiabu.2016.11.005

Jimenez, M. E., Roy, W., Schwartz-Soicher, O., Lin, Y., & Reichman, N. E. (2017). Adverse childhood experiences and ADHD diagnosis at age 9 years in a national urban sample. *Academic Pediatrics*, *17*(4), 356–361. https://doi.org/10.1016/j.acap.2016.12.009

Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse experiences in early childhood and kindergarten outcomes. *Pediatrics*, *137*(2), e20151839. https://doi.org/10.1542/peds.2015-1839

Jones, M. S., & Pierce, H. (2020). Early exposure to adverse childhood experiences and youth delinquent behavior in fragile families. *Youth & Society*, 0044118X20908759. https://doi.org/10.1177/0044118X20908759

Kaushik, A., Kostaki, E., & Kyriakopoulos, M. (2016). The stigma of mental illness in children and adolescents: A systematic review. *Psychiatry Research*, *243*, 469–494. https://doi.org/10.1016/j.psychres.2016.04.042

Kennedy, S., & Bumpass, L. L. (2008). Cohabitation and children's living arrangements: New estimates from the United States. *Demographic Research*, *19*(47), 1663–1692. https://doi.org/10.4054/DemRes.2008.19.47

Kerker, B. D., Zhang, J., Nadeem, E., Stein, R. E. K., Hurlburt, M. S., Heneghan, A., … McCue Horwitz, S. (2015). Adverse childhood experiences and mental health, chronic medical conditions, and development in young children. *Academic Pediatrics*, *15*(5), 510–517. https://doi.org/10.1016/j.acap.2015.05.005

Kern, M. L., Benson, L., Steinberg, E. A., & Steinberg, L. (2016). The EPOCH measure of adolescent well-being. *Psychological Assessment*, *28*(5), 586–597. https://doi.org/10.1037/pas0000201

Kia-Keating, M., Santacrose, D. E., Liu, S. R., & Adams, J. (2017). Using community-based participatory research and human-centered design to address violence-related health Disparities Among Latino/a Youth. *Family & Community Health*, *40*(2), 160–169. https://doi.org/10.1097/FCH.0000000000000145

Konrad, K., Firk, C., & Uhlhaas, P. J. (2013). Brain development during adolescence: Neuroscientific insights into this developmental period. *Deutsches Arzteblatt International*, *110*(25), 425–431. https://doi.org/10.3238/arztebl.2013.0425

LaRusso, M. D., Romer, D., & Selman, R. L. (2008). Teachers as builders of respectful school climates: Implications for adolescent drug use norms and depressive symptoms in high school. *Journal of Youth and Adolescence*, *37*(4), 386–398. https://doi.org/10.1007/s10964-007-9212-4

Lee, F. S., Heimer, H., Giedd, J. N., Lein, E. S., Šestan, N., Weinberger, D. R., & Casey, B. J. (2014). Adolescent mental health—Opportunity and obligation. *Science (New York, N.Y.)*, *346*(6209), 547–549. https://doi.org/10.1126/science.1260497

Lerner, R. M., & Steinberg, L. (2004). *Handbook of adolescent psychology*. Hoboken, NJ, USA: John Wiley & Sons.

Lindsey, C., & Sheather, S. (2010). Power transformation via multivariate Box–Cox. The Stata Journal, 10(1), 69-81.

Liu, S. R., Kia-Keating, M., Nylund-Gibson, K., & Barnett, M. L. (2020). Co-Occurring youth profiles of adverse childhood experiences and protective factors: Associations with health, resilience, and racial disparities. *American Journal of Community Psychology*, *65*(1–2), 173–186. https://doi.org/10.1002/ajcp.12387

Loukas, A., & Robinson, S. (2004). Examining the moderating role of perceived school climate in early adolescent adjustment. *Journal of Research on Adolescence*, *14*(2), 209–233. https://doi.org/10.1111/j.1532-7795.2004.01402004.x

Luby, J. L., Barch, D., Whalen, D., Tillman, R., & Belden, A. (2017). Association between early life adversity and risk for poor emotional and physical health in adolescence: A putative mechanistic neurodevelopmental pathway. *JAMA Pediatrics*, *171*(12), 1168–1175. https://doi.org/10.1001/jamapediatrics.2017.3009

Luby, J. L., Barch, D., Whalen, D., Tillman, R., & Belden, A. (2017). Association between early life adversity and risk for poor emotional and physical health in adolescence: A putative mechanistic neurodevelopmental pathway. *JAMA Pediatrics*, *171*(12), 1168–1175. https://doi.org/10.1001/jamapediatrics.2017.3009

Maimon, D., Browning, C. R., & Brooks-Gunn, J. (2010). Collective efficacy, family attachment, and urban adolescent suicide attempts. *Journal of Health and Social Behavior*, *51*(3), 307–324. https://doi.org/10.1177/0022146510377878

Marcia, J. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, *3*(5), 551–558. https://doi.org/10.1037/h0023281

Marcia, J. (1980). *Identity in adolescence* (Vol. 9). New York, NY, US: Wiley & Sons.

Masten, A. S. (2001). Ordinary magic. Resilience processes in development. *The American Psychologist*, *56*(3), 227–238.

Masten, Ann S. (2004). Regulatory processes, risk, and resilience in adolescent development. *Annals of the New York Academy of Sciences*, *1021*(1), 310–319. https://doi.org/10.1196/annals.1308.036

Masten, Ann S. (2019). Resilience from a developmental systems perspective. *World Psychiatry*, *18*(1), 101–102. https://doi.org/10.1002/wps.20591

Masten, Ann S., & Barnes, A. J. (2018). Resilience in children: Developmental perspectives. *Children*, *5*(7), 98. https://doi.org/10.3390/children5070098

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin*, *114*(2), 376. https://doi.org/10.1037/0033-2909.114.2.376

McDonald, L., Billingham, S., Conrad, T., Morgan, A., Nancy, O., & Payton, E. (1997). Families and schools together (fast): integrating community development with clinical strategies. *Families in Society*, *78*(2), 140–155. https://doi.org/10.1606/1044-3894.754

Mcdonald, L., Miller, H., & Sandler, J. (2015). A social ecological, relationship-based strategy for parent involvement: Families And Schools Together (FAST). *Journal of Children's Services*, *10*, 218–230. https://doi.org/10.1108/JCS-07-2015-0025

McEwen, B. S., Gray, J. D., & Nasca, C. (2014). Recognizing resilience: Learning from the effects of stress on the brain. *Neurobiology of Stress*, *1*, 1–11. https://doi.org/10.1016/j.ynstr.2014.09.001

McGoey, K. E., & Graves Jr., S. L. (2016). Evidence-based interventions in urban schools: unique implications for implementation: introduction to the special issue. *School Psychology Forum*, *10*(2), 131–133.

Melchert, T. P. (2015). *The foundational framework of the biopsychosocial approach.* Washington, DC, US: American Pscyhcological Association.

Mental Health America. (2015, September 17). The state of mental health in America. Retrieved August 15, 2019, from Mental Health America website: https://www.mentalhealthamerica.net/issues/state-mental-health-america

Merikangas, K. R., He, J., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., … Swendsen, J. (2010). Lifetime prevalence of mental disorders in US adolescents: Results from the national comorbidity study-adolescent supplement (NCS-A). *Journal of the American Academy of Child and Adolescent Psychiatry*, *49*(10), 980–989. https://doi.org/10.1016/j.jaac.2010.05.017

Mink, C. (2019). *There's a huge shortage of mental health providers for kids who need help*. Center for Health Journalism. https://www.centerforhealthjournalism.org/2019/04/22/there-s-huge-shortage-mental-health-providers-kids-who-need-help

Moore, K. A., & N. Ramirez, A. (2016). Adverse childhood experience and adolescent well-being: Do protective factors matter? *Child Indicators Research*, *9*(2), 299–316. https://doi.org/10.1007/s12187-015-9324-4

Mukolo, A., Heflinger, C. A., & Wallston, K. A. (2010). The stigma of childhood mental disorders: A conceptual framework. *Journal of the American Academy of Child and Adolescent Psychiatry*, *49*(2), 92–198.

NAACP. (n.d.). *NAACP | Criminal Justice Fact Sheet*. NAACP. Retrieved May 22, 2020, from https://www.naacp.org/criminal-justice-fact-sheet/

National Alliance on Mental Illness. (2019). Mental health facts children and teens. Retrieved June 15, 2019, from Mental Health by the Numbers website: https://www.nami.org/learn-more/mental-health-by-the-numbers

National Scientific Council on the Developing Child. (2014). Excessive stress disrupts the architecture of the developing brain. Retrieved July 18, 2019, from Center on the Developing Child at Harvard University website: www.developingchild.harvard.edu

Notterman, D. A., & Mitchell, C. (2015). Epigenetics and understanding the impact of social determinants of health. *Pediatric Clinics of North America*, *62*(5), 1227–1240. https://doi.org/10.1016/j.pcl.2015.05.012

Olds, D. L., Eckenrode, J., Henderson, C. R., Kitzman, H., Powers, J., Cole, R., Sidora, K., Morris, P., Pettitt, L. M., & Luckey, D. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect. Fifteen-year follow-up of a randomized trial. *JAMA*, *278*(8), 637–643.

Olds, D. L., Henderson, C. R., Chamberlin, R., & Tatelbaum, R. (1986). Preventing child abuse and neglect: A randomized trial of nurse home visitation. *Pediatrics*, *78*(1), 65–78.

Perreira, K. M., Deeb-Sossa, N., Harris, K. M., & Bollen, K. (2005). What are we measuring? An evaluation of the CES-D across race/ethnicity and immigrant generation. *Social Forces*, *83*(4), 1567–1601. https://doi.org/10.1353/sof.2005.0077

Princeton University (2020). *Fragile Families and Child Wellbeing Study* (2020 Re-Release) [Data Set]. Office of Population Research. https://opr.princeton.edu/archive/FF/

Princeton University. (2019). Data and documentation | Fragile families and child wellbeing study. Retrieved August 14, 2019, from https://fragilefamilies.princeton.edu/documentation

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*(3), 385–401. https://doi.org/10.1177/014662167700100306

Reichman, N. E., Corman, H., Noonan, K., & Jiménez, M. E. (2018). Infant health and future childhood adversity. *Maternal and Child Health Journal*, *22*(3), 318–326. https://doi.org/10.1007/s10995-017-2418-5

Reichman, N. E., Teitler, J. O., Garfinkel, I., & McLanahan, S. S. (2001). Fragile families: Sample and design. *Children and Youth Services Review*, *23*(4), 303–326. https://doi.org/10.1016/S0190-7409(01)00141-4

Ronen, T., Hamama, L., Rosenbaum, M., & Mishely-Yarlap, A. (2016). Subjective well-being in adolescence: The role of self-control, social Support, age, gender, and familial crisis. *Journal of Happiness Studies*, *17*(1), 81–104. https://doi.org/10.1007/s10902-014-9585-5

Rueger, S. Y., Malecki, C. K., Pyun, Y., Aycock, C., & Coyle, S. (2016). A meta-analytic review of the association between perceived social support and depression in childhood and adolescence. *Psychological Bulletin*, *142*(10), 1017–1067. https://doi.org/10.1037/bul0000058

Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. *Annals of the Academy of Medicine, Singapore*, *8*(3), 324–338.

Rutter, Michael. (1990). Psychosocial resilience and protective mechanisms. In J.E. Rolf, A.S. Masten, D. Cicchetti, K.H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology (pp.181-214).* https://doi.org/10.1017/CBO9780511752872.013

Sacks, V., & Murphey, D. (2018). *The prevalence of adverse childhood experiences, nationally, by state, and by race or ethnicity*. Retrieved from https://www.childtrends.org/publications/prevalence-adverse-childhood-experiences-nationally-state-race-ethnicity

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, *277*(5328), 918–924. https://doi.org/10.1126/science.277.5328.918

Savolainen, J., Eisman, A., Mason, W. A., Schwartz, J. A., Miettunen, J., & Järvelin, M.-R. (2018). Socioeconomic disadvantage and psychological deficits: pathways from early cumulative risk to late-adolescent criminal conviction. *Journal of Adolescence*, *65*, 16–24. https://doi.org/10.1016/j.adolescence.2018.02.010

Schalinski, I., Teicher, M. H., Nischk, D., Hinderer, E., Müller, O., & Rockstroh, B. (2016). Type and timing of adverse childhood experiences differentially affect severity of PTSD, dissociative and depressive symptoms in adult inpatients. *BMC Psychiatry*, *16*, 295. https://doi.org/10.1186/s12888-016-1004-5

Schalinski, I., Teicher, M. H., Nischk, D., Hinderer, E., Müller, O., & Rockstroh, B. (2016). Type and timing of adverse childhood experiences differentially affect severity of PTSD, dissociative and depressive symptoms in adult inpatients. *BMC Psychiatry*, *16*, 295. https://doi.org/10.1186/s12888-016-1004-5

Schiller, J. S., Lucas, J. W., Ward, B. W., & Peregoy, J. A. (2012). Summary health statistics for U.S. adults: National health interview survey, 2010. *Vital and Health Statistics. Series 10, Data from the National Health Survey*, (252), 1–207.

Schilling, E. A., Aseltine, R. H., & James, A. (2016). The SOS suicide prevention program: further evidence of efficacy and effectiveness. *Prevention Science*, *17*(2), 157–166. https://doi.org/10.1007/s11121-015-0594-3

Schroeder, A., Slopen, N., & Mittal, M. (2018). Accumulation, timing, and duration of early childhood adversity and behavior problems at age 9. *Journal of Clinical Child and Adolescent Psychology*, 1–14. https://doi.org/10.1080/15374416.2018.1496440

Sege, R., Bethell, C., Linkenbach, J., Jones, J., Klika, B., & Pecora, P. (2017). Balancing adverse childhood experiences (ACEs) with HOPE. *Boston: The Medical Foundation*, 1–31.

Shochet, I. M., Dadds, M. R., Ham, D., & Montague, R. (2006). School connectedness is an underemphasized parameter in adolescent mental health: Results of a community prediction study. *Journal of Clinical Child and Adolescent Psychology*, *35*(2), 170–179. https://doi.org/10.1207/s15374424jccp3502_1

Shonkoff, J. P., Garner, A. S., The Committee on Psychosocial Aspects of Child and Family Health, C. on E. C., Siegel, B. S., Dobbins, M. I., Earls, M. F., … Wood, D. L. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, *129*(1), 232–246. https://doi.org/10.1542/peds.2011-2663

Simons, R., Simons, L., Burt, C., Brody, G., & Cutrona, C. (2005). Collective efficacy, authoritative parenting and delinquency: A longitudinal test of a model integrating community and family level processes. *Criminology*, *43*, 989–1029. https://doi.org/10.1111/j.1745-9125.2005.00031.x

Smith, C., & Carlson, B. E. (1997). Stress, coping, and resilience in children and youth. *Social Service Review*, *71*(2), 231–256. https://doi.org/10.1086/604249

So, M., McCord, R. F., & Kaminski, J. W. (2019). Policy levers to promote access to and utilization of children's mental health services: a systematic review. *Administration and Policy in Mental Health and Mental Health Services Research*, *46*(3), 334–351. https://doi.org/10.1007/s10488-018-00916-9

Soleimanpour, S., Geierstanger, S., & Brindis, C. D. (2017). Adverse childhood experiences and resilience: Addressing the unique needs of adolescents. *Academic Pediatrics*, *17*(7, Supplement), 108–114. https://doi.org/10.1016/j.acap.2017.01.008

Southwick, S. M., Sippel, L., Krystal, J., Charney, D., Mayes, L., & Pietrzak, R. (2016). Why are some individuals more resilient than others: The role of social support. *World Psychiatry: Official Journal of the World Psychiatric Association*, *15*(1), 77–79. https://doi.org/10.1002/wps.20282

StataCorp. 2019. *Stata Statistical Software: Release 16*. College Station, TX: StataCorp LLC.

Substance Abuse and Mental Health Services Administration. SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach. HHS Publication No. (SMA) 14-4884. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.

Substance Abuse and Mental Health Services Administration. Trauma-Informed Care in Behavioral Health Services. Treatment Improvement Protocol (TIP) Series 57. HHS Publication No. (SMA) 13-4801. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.

The Panel Study of Income Dynamics Child Development Supplement: User Guide for CDS-II. (2010). Retrieved from https://psidonline.isr.umich.edu/CDS/cdsii_userGd.pdf

Thompson, R., Flaherty, E. G., English, D. J., Litrownik, A. J., Dubowitz, H., Kotch, J. B., & Runyan, D. K. (2015). Trajectories of adverse childhood experiences and self-reported health at age 18. *Academic Pediatrics*, *15*(5), 503–509. https://doi.org/10.1016/j.acap.2014.09.010

U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. (2020). *Child*

Maltreatment 2015. Available from https://www.acf.hhs.gov/cb/resource/child-maltreatment-2018

United States Department of Health and Human Services. Centers for Disease Control and Prevention. National Center for Health Statistics. (2007). *National survey of children's health, 2003: Version 1*. https://doi.org/10.3886/icpsr04691.v1

Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *The Lancet*, *379*(9826), 1641–1652. https://doi.org/10.1016/S0140-6736(12)60149-4

Wallerstein, N. B., & Duran, B. (2006). Using community-based participatory research to address health disparities. *Health Promotion Practice*, *7*(3), 312–323. https://doi.org/10.1177/1524839906289376

Wang, K., Zhang, A., Zheng, H., Kim, Y., & Padilla, Y. (2020). Proximal social determinants of adolescents' health: the importance of everyday life circumstances. *Youth & Society*, 0044118X20918436. https://doi.org/10.1177/0044118X20918436

Wang, X., & Maguire-Jack, K. (2018). Family and environmental influences on child behavioral health: The role of neighborhood disorder and adverse childhood experiences. *Journal of Developmental & Behavioral Pediatrics*, *39*(1), 28–36. https://doi.org/10.1097/DBP.0000000000000506

Wang, Y.-R., Sun, J.-W., Lin, P.-Z., Zhang, H.-H., Mu, G.-X., & Cao, F.-L. (2019). Suicidality among young adults: Unique and cumulative roles of 14 different adverse childhood experiences. *Child Abuse & Neglect*, *98*, 104183. https://doi.org/10.1016/j.chiabu.2019.104183

Waters, S. K., Cross, D. S., & Runions, K. (2009). Social and ecological structures supporting adolescent connectedness to school: A theoretical model. *Journal of School Health*, *79*(11), 516–524. https://doi.org/10.1111/j.1746-1561.2009.00443.x

Whalen, D. J., Belden, A. C., Tillman, R., Barch, D. M., & Luby, J. L. (2016). Early adversity, psychopathology, and latent class profiles of global physical health from preschool through early adolescence. *Psychosomatic Medicine*, *78*(9), 1008–1018. https://doi.org/10.1097/PSY.0000000000000398

Whalen, D. J., Belden, A. C., Tillman, R., Barch, D. M., & Luby, J. L. (2016). Early adversity, psychopathology, and latent class profiles of global physical health from preschool through early adolescence. *Psychosomatic Medicine*, *78*(9), 1008–1018. https://doi.org/10.1097/PSY.0000000000000398

WHO Commission on Social Determinants of Health, & World Health Organization (Eds.). (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health*. Geneva, Switzerland: World Health Organization, Commission on Social Determinants of Health.

Winship, C., & Radbill, L. (2016). Sampling weights and regression analysis: *Sociological Methods & Research*. https://doi.org/10.1177/0049124194023002004

Zhang, L., Fang, J., Wan, Y., Gong, C., Su, P., Tao, F., & Sun, Y. (2020). The patterns of adverse childhood experiences among Chinese children: Four-year longitudinal associations with psychopathological symptoms. *Journal of Psychiatric Research*, *122*, 1–8. https://doi.org/10.1016/j.jpsychires.2019.12.009

Table 1

Sample Comparisons

	Analytic Sample	Excluded Baseline Sample	Excluded Year 15 Sample
	(N=1960)	(N=2938)	(N=1484)
Mother Age (BL)	25.24 (6.02)	25.30 (6.05)	24.96%
Household Income (BL)	33534.34 (32222.73)	30966.13 (31085.09)*	31539.72 (31877.27)
Mother Age (Y15)	39.51 (9.58)	-	37.37% (13.95)*
Household Income (Y15)	60509.51 (60630.63)	-	60990.71 (67890.43)
Child Age (Y15)	15.40 (.63)	-	15.83 (1.10)*
Child Gender- Male	51.28%	52.81%	51.28%
Mother Married (BL)	25.20%	23.60%	22.64%
Mother Married (Y15)	25.39%	-	24.71%
Mother Edu (BL)- Less high school	30.18%	37.76%*	34.03%*
Mother Edu (BL)- High school	31.15%	29.65%	32.75%
Mother Edu (BL)- Some college	26.71%	22.70%*	23.30%*
Mother Edu (BL)- College	11.95%	9.88%	9.93%
Mother Edu (Y15)- Less high school	17.42%	-	17.93%
Mother Edu (Y15)- High school	18.04%	-	21.93%*
Mother Edu (Y15)- Some college	44.30%	-	42.97%
Mother Edu (Y15)- College	20.24%	-	17.17%*
Mother Race- White	23.27%	19.62%*	19.77%*
Mother Race- Black	50.84%	45.45%*	49.12%
Mother Race- Hispanic	22.66%	30.47%*	27.19%*
Mother Race- Other	3.22%	4.47%	3.91%
Child Race- White	19.35%	16.38%	16.38%
Child Race- Black	50.03%	47.73%	47.73%
Child Race- Hispanic	22.86%	27.59%*	27.59%*
Child Race- Other	24.26%	2.91%	2.91%
Child Race- Multi-Racial	5.34%	5.39%	5.39%

Note. BL (baseline wave). Y15 (year 15 wave). The analytic sample represents and baseline sample as well as the analytic sample and excluded sample are independent samples. The baseline and Year 15 samples are those who were excluded from the analytic sample. * = differs significantly from analytic sample at $p \leq .05$.

Table 2

Descriptive Statistics for Outcomes, Moderators, and Covariates (N = 1960)

Variables	N	% Missing	Range	Mean (SD)
Adolescent mental health outcomes				
Depression	1955	.26	1-4	1.60 (.60)
Anxiety	1955	.26	1-4	1.82 (.65)
Positive Functioning	1955	.26	1.6-4	3.43 (.33)
Adolescent social support moderators				
Parent Relationship	1952	.41	1-4	3.41 (.66)
School Connectedness	1927	1.68	1-4	3.44 (.58)
Neighborhood Collective Efficacy	1942	.92	1-4	2.86 (.62)
Adolescent Characteristics				
Age	1960	0	14-18	15.40 (.63)
Sex	1960	0		51% Male
Race/Ethnicity	1855	5.36		
White, non-Hispanic				18.32%
Black, non-Hispanic				47.35%
Hispanic/Latino				21.63%
Other, non-Hispanic				2.30%
Multi-racial, non-Hispanic				5.36%
Primary Caregiver Characteristics				
Age	1960	0	15-43	25.24 (6.02)
Race/Ethnicity	1955	.26		
White, non-Hispanic				23.21%
Black, non-Hispanic				50.71%
Hispanic/Latino				22.60%
Other				3.21%
Married at baseline	1960	0		25.20%
Baseline Education	1958	.10		
Less than high school				30.15%
High school				31.12%
Some college/technical				26.68%
College or beyond				11.94%
Year 15 Education	1957	.15		
Less than high school				17.40%
High school				18.01%
Some college/technical				44.23%
College or beyond				20.20%
Baseline Household Income	1960	0	0-133,750	33,534.34 (32,222.73)
Year 15 Household Income	1960	0	0-530,000	60,509.51 (60630.63)

Table 3

Descriptive Statistics for ACE Summary Scores (N = 1960)

Variables	N	% Missing	Range	Mean (SD)
Year 1 Index	1488	24.08	0-5	1.05 (1.10)
Year 3 Index	1577	19.54	0-7	1.64 (1.49)
Year 5 Index	1401	28.52	0-8	1.46 (1.39)
Year 9 Index	1146	41.53	0-7	1.50 (1.35)
Year 15 Index	1381	29.54	0-6	1.37 (1.23)
Total Sum (all years)	540	72.45	0-21	5.45 (4.51)
Total Cumulative (all years)	540	72.45	0-4.2	1.09 (.90)
High Adversity (all years)	540	72.45	0-3	.08 (.33)

Note. The total possible ACEs for each year are 6, 8, 9, 9, 9 for years 1, 3, 5, 9, and 15 respectively.

Table 4

Descriptive Statistics for Total ACE Score across All Timepoints (N = 1960)

Total Number of ACEs	N	%
0	53	9.81
1-4	223	41.29
5-10	186	34.44
11-15	61	11.3
16-21	17	3.17

Table 5

Descriptive Statistics for Individual ACEs and Totals across Five Timepoints (N = 1960)

	Age 1		*Age 3*		*Age 5*		*Age 9*		*Age 15*	
Individual ACEs	n	%	n	%	n	%	n	%	n	%
Physical Abuse	602	1.81	330	18.9	327	18.66	339	20.21	267	13.64
Psychological Abuse	-	-	506	28.32	356	19.4	356	20.71	296	15.11
Sexual Abuse	-	-	-	-	10	2.21	22	1.26	10	0.54
Neglect	-	-	220	11.26	268	14.39	264	14.25	27	1.38
Parental Incarceration	115	6.43	436	23.67	388	22.43	231	14.37	366	22.39
Domestic Violence	167	8.86	209	10.77	198	10.21	131	6.75	74	3.79
Substance Abuse	160	10.08	319	16.70	305	16.52	426	23.43	129	6.79
Mental Illness	252	12.86	310	15.82	224	11.43	237	12.26	259	0.13
Father Absent	835	42.69	933	47.68	1068	54.55	1149	59.60	1232	68.56
Total ACEs										
0	576	38.71	419	26.57	418	29.84	302	26.35	395	28.60
1	480	32.26	432	27.39	409	29.19	358	31.24	424	30.70
2	278	18.68	321	20.36	271	19.34	246	21.47	321	23.24
3	105	7.06	210	13.32	178	12.71	145	12.65	159	11.51
4	38	2.55	120	7.61	81	5.78	62	5.41	59	4.27
>5	11	.74	75	4.75	44	3.13	33	1.66	23	1.67

Note. The percentage of individual ACEs is the proportion of affirmative responses out of total responses, not including missing. "-" indicates that those ACEs were not calculated at those time points.

PPORT

oderators (social support), Predictors (ACEs), and Covariates

5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.30*	-.12*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.16*	-.04	.55*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.16*	-.09*	.66*	.23*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.16*	-.09*	.81*	.56*	.52*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.13*	-.10*	.80*	.41*	.42*	.61*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.18*	-.08*	.75*	.46*	.37*	.50*	.58*	-	-	-	-	-	-	-	-	-	-	-	-	-
.20*	-.13*	.73*	.36*	.43*	.49*	.52*	.51*	-	-	-	-	-	-	-	-	-	-	-	-
07*	.03	-.02	-.01	.02	.05*	.06*	.07*	.01	-	-	-	-	-	-	-	-	-	-	-
.08*	-.03	.15*	.09*	.08*	.06*	.03	.02	.07*	.03	-	-	-	-	-	-	-	-	-	-
08*	.07*	-.35*	-.20*	-.21*	-.23*	-.23*	-.23*	-.30*	.01	-.08*	-	-	-	-	-	-	-	-	-
12*	.10*	-.35*	-.15*	-.31*	-.25*	-.23*	-.21*	-.32*	-.02	-.14*	.34*	-	-	-	-	-	-	-	-
14*	.16*	-.36*	-.14*	-.28*	-.23*	-.21*	-.26*	-.32*	.01	-.07*	.25*	.55*	-	-	-	-	-	-	-
.08*	-.11*	.38*	.16*	.34*	.30*	.28*	.26*	.36*	-.02	.09*	-.41*	-.50*	-.42*	-	-	-	-	-	-
08*	.08*	-.21*	-.08	-.22*	-.12*	-.12*	-.09*	-.20*	-.01	-.11*	.23*	.37*	.35*	-.38*	-	-	-	-	-
.14*	-.07*	.37*	.11*	.30*	.21*	.19*	.18*	.29*	-.01	.12*	-.17*	-.26*	-.27*	.31*	-.49*	-	-	-	-
08*	.02	-.16*	-.06	-.12*	-.15*	-.10*	-.11*	-.12*	.04	-.01	-.04	-.07*	-.04	.04	-.27*	-.54*	-	-	-
.04	.01	-.09*	-.03	-.06*	-.01	-.06*	-.06	-.09*	.06*	-.06*	.08*	.10*	.10*	-.10*	-.08*	-.16*	-.09*	-	-
-.01	-.02	-.02	.06	.00	.03	.04	.01	.01	-.05*	-.02	.00	.01	.00	-.01	-.12*	-.24*	-.13*	-.04	-
10*	.10*	-.22*	-.07	-.23*	-.11*	-.09*	-.08*	-.19*	.01	-.12*	.22*	.34*	.33*	-.35*	.81*	-.53*	-.19*	.04	.09*
.14*	-.08*	.39*	.15*	.31*	.22*	.18*	.20*	.29*	-.01	.12*	-.17*	-.26*	-.28*	.31*	-.50*	.91*	-.53*	-.10*	-.07*
05*	.00	-.16*	-.07	-.11*	-.14*	-.10*	-.12*	-.11*	-.01	.00	-.03	-.06*	-.05*	.02	-.19*	-.49*	.85*	-.07*	-.10*
.03	-.01	-.09*	-.05	-.06*	-.03	-.05	-.05	-.09*	.03	-.06*	.04	.09*	.11*	-.10*	-.07*	-.12*	-.05*	.37*	.23*
.09*	-.09*	.17*	.08	.17*	.10*	.11*	.12*	.12*	-.02	.08*	-.26*	-.29*	-.26*	.24*	-.17*	.05*	.15*	-.06*	-.06*
-.02	-.01	.16*	.11*	.06*	.09*	.05	.08*	.12*	.01	.04	-.10*	-.17*	-.15*	.16*	-.13*	.11*	-.01	-.01	.02
.04	.03	-.04	-.08	-.06*	-.03	-.01	-.03	-.03	.00	-.06*	.09*	.09*	.08*	-.06*	.03	-.02	-.03	.02	.02
11*	.10*	-.30*	-.12*	-.23*	-.21*	-.19*	-.21*	-.28*	.01	-.08*	.40*	.53*	.47*	-.49*	.37*	-.21*	-.14*	.06*	.03
.05*	-.06*	.08	.04	.11*	.04	.04	.02	.06*	-.02	.06*	-.09*	-.20*	-.22*	.16*	-.12*	-.03	.19*	-.03	-.05*
-.03	-.02	.08	.03	.02	.04	.05*	.10*	.06*	.01	.01	-.03	-.12*	-.14*	.09*	-.05*	.01	.05*	-.03	-.01
.05*	-.03	.14*	.08	.07*	.07*	.05	.05	.09*	-.01	.03	-.11*	-.11*	-.08*	.12*	-.08*	.13*	-.08*	.02	.01
13*	.10*	-.27*	-.14*	-.20*	-.16*	-.14*	-.16*	-.21*	.03	-.10*	.25*	.45*	.43*	-.38*	.27*	-.14*	-.13*	.03	.05*

L (baseline wave). C (child). M (mother). Edu (education). HS (high school). P (parent).

Table 7

Aim 2.1- ACEs at Distinct Time Periods Predicting Mental Health and Well-being (N = 1960)

	Depression			Anxiety			Positive Functioning		
	β	SE	*p*	β	SE	*p*	β	SE	*p*
Year 1	-.01	.03		.03	.03		-.01	.03	
Year 3	.06	.04		.05	.04		.00	.04	
Year 5	-.05	.04		-.03	.04		.00	.04	
Year 9	.09	.04	*	.04	.04		-.10	.04	*
Year 15	.08	.04	+	.05	.04		-.05	.04	
Child Age (Y15)	.01	.02		-.01	.02		-.01	.02	
Parent Age (BL)	.02	.03		.02	.03		.02	.03	
Income (BL)	.00	.03		.01	.03		-.02	.03	
Income (Y15)	-.03	.04		.00	.03		.01	.03	
Child Gender- Female	.10	.02	***	.06	.02	*	-.07	.02	***
Marital Status- Married	.00	.03		-.02	.03		-.04	.03	
Child Race- Black	.03	.08		-.08	.08		.15	.08	
Child Race- Hispanic	-.03	.05		-.07	.05		.10	.05	*
Child Race- Other	.03	.03		-.02	.02		.02	.03	
Child Race- Multiple	.06	.03		.03	.03		.03	.03	
Mother Race- Black	-.03	.07		.02	.08		-.03	.08	
Mother Race- Hispanic	.05	.04		.08	.05		-.07	.05	
Mother Race- Other	-.02	.03		.00	.03		-.03	.03	
M Edu- High School (BL)	.01	.04		.00	.04		-.02	.03	
M Edu- Some College (BL)	-.02	.03		-.02	.04		-.01	.04	
M Edu-College (BL)	-.02	.04		-.05	.04		-.04	.04	
P Edu- High School (Y15)	-.07	.04		-.05	.04		.07	.04	
P Edu- Some College (Y15)	-.09	.04	*	-.04	.04		.05	.04	
P Edu- College (Y15)	-.06	.05		-.01	.05		.06	.05	
Constant	2.08	.62	***	2.85	.61	***	10.71	.70	***

Note. Y15 (year 15 wave). BL (baseline wave) M (mother) P (parent). Standardized coefficients and robust standard errors are reported. + indicates a previously significant coefficient removed after Benjamini-Hochberg corrections. Reference groups of dummy variables left of out models include Child Gender = Male; Marital Status = Not Married; Child Race = White; Mother Race = White; Mother Education Baseline = Less than High School; Parent Education Year 15 = Less than High School. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 8

Aim 2.1 – Total Cumulative ACEs across Time Predicting Mental Health and Well-being (N = 1960)

	Depression			Anxiety			Positive Functioning		
	β	SE	*p*	β	SE	*p*	β	SE	*p*
Total Cumulative	.23	.05	***	.11	.05	*	-.21	.05	***
Child Age (Y15)	.00	.03		-.02	.02		.01	.03	
Parent Age (BL)	.04	.03		.03	.03		-.01	.03	
Income (BL)	.00	.03		.00	.03		-.02	.03	
Income (Y15)	-.03	.04		.00	.04		.00	.03	
Child Gender- Female	.10	.02	***	.06	.02	*	-.06	.02	*
Marital Status- Married	.01	.03		-.03	.03		-.04	.03	
Child Race- Black	.01	.08		-.09	.08		.16	.08	
Child Race- Hispanic	-.03	.05		-.08	.05		.10	.05	
Child Race- Other	.03	.03		-.03	.02		.02	.03	
Child Race- Multiple	.05	.03		.03	.03		.03	.03	
Mother Race- Black	-.04	.08		.02	.08		-.01	.08	
Mother Race- Hispanic	.07	.05		.09	.05		-.08	.05	
Mother Race- Other	-.02	.03		.00	.03		-.03	.03	
M Edu- High School (BL)	.01	.04		.00	.04		-.01	.04	
M Edu- Some College (BL)	-.01	.04		-.02	.04		-.02	.04	
M Edu-College (BL)	-.03	.05		-.05	.04		-.04	.05	
P Edu- High School (Y15)	-.05	.04		-.04	.04		.05	.04	
P Edu- Some College (Y15)	-.08	.04		-.03	.04		.05	.05	
P Edu- College (Y15)	-.04	.05		.00	.05		.04	.05	
Constant	2.22	.64	***	3.00	.61	***	10.54	.72	***

Note. Y15 (year 15 wave). BL (baseline wave) M (mother) P (parent). Standardized coefficients and robust standard errors are reported. Reference groups of dummy variables left of out models include Child Gender = Male; Marital Status = Not Married; Child Race = White; Mother Race = White; Mother Education Baseline = Less than High School; Parent Education Year 15 = Less than High School. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 9

Aim 2.2 – High Adversity across Time Predicting Mental Health and Well-being (N = 1960)

	Depression			Anxiety			Positive Functioning		
	β	SE	*p*	β	SE	*p*	β	SE	*p*
High Adversity	.12	.05	*	.06	.05		-.12	.04	***
Child Age (Y15)	.01	.02		-.01	.02		.00	.02	
Parent Age (BL)	.02	.03		.02	.03		.01	.03	
Income (BL)	.00	.03		.00	.03		-.01	.03	
Income (Y15)	-.05	.04		-.01	.03		.02	.03	
Child Gender- Female	.09	.02	***	.05	.02	*	-.06	.02	*
Marital Status- Married	-.02	.03		-.04	.03		-.02	.03	
Child Race- Black	.03	.08		-.08	.08		.14	.08	
Child Race- Hispanic	-.05	.05		-.09	.05		.11	.05	*
Child Race- Other	.03	.03		-.03	.02		.02	.03	
Child Race- Multiple	.05	.03		.03	.03		.04	.03	
Mother Race- Black	-.04	.08		.03	.08		-.01	.08	
Mother Race- Hispanic	.05	.05		.09	.05		-.06	.05	
Mother Race- Other	-.02	.03		.00	.03		-.03	.03	
M Edu- High School (BL)	.00	.04		-.01	.04		.00	.04	
M Edu- Some College (BL)	-.02	.04		-.02	.04		-.01	.04	
M Edu-College (BL)	-.04	.04		-.06	.04		-.03	.04	
P Edu- High School (Y15)	-.05	.04		-.04	.04		.04	.04	
P Edu- Some College (Y15)	-.07	.04		-.03	.04		.04	.04	
P Edu- College (Y15)	-.03	.05		.00	.05		.04	.05	
Constant	2.52	.62	***	3.15	.60	***	10.29	.71	***

Note. Y15 (year 15 wave). BL (baseline wave) M (mother) P (parent). Standardized coefficients and robust standard errors are reported. Reference groups of dummy variables left of out models include Child Gender = Male; Marital Status = Not Married; Child Race = White; Mother Race = White; Mother Education Baseline = Less than High School; Parent Education Year 15 = Less than High School. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 10

Aim 3- The Moderating Role of Caregiver Relationships on ACEs Predicting Mental Health and Well-being (N = 1960)

	Depression			Anxiety			Positive Functioning		
	β	SE	*p*	β	SE	*p*	β	SE	*p*
ACEs Cumul.	.19	.06	***	.07	.05		-.15	.05	***
Caregiver Relationship	-.21	.03	***	-.17	.03	***	.29	.02	***
Total x Relationship	.20	.26		.38	.25		-.33	.26	
Child Age (Y15)	.00	.02		-.02	.02		.01	.02	
Parent Age (BL)	.03	.03		.02	.03		.01	.03	
Income (BL)	.02	.03		.01	.03		-.03	.03	
Income (Y15)	-.03	.04		.00	.03		.01	.03	
Child Gender- Female	.08	.02	***	.04	.02		-.04	.02	
Marital Status- Married	.01	.03		-.03	.03		-.04	.03	
Child Race- Black	.01	.08		-.09	.08		.16	.08	*
Child Race- Hispanic	-.02	.05		-.07	.05		.09	.05	
Child Race- Other	.02	.03		-.03	.02		.03	.03	
Child Race- Multiple	.05	.03		.02	.03		.04	.03	
Mother Race- Black	-.03	.08		.03	.08		-.02	.07	
Mother Race- Hispanic	.07	.05		.09	.05		-.08	.05	
Mother Race- Other	-.02	.03		.00	.03		-.02	.03	
M Edu- High School (BL)	.01	.04		.00	.04		-.02	.03	
M Edu- Some College (BL)	-.01	.04		-.02	.04		-.02	.03	
M Edu-College (BL)	-.02	.04		-.05	.04		-.05	.04	
P Edu- High School (Y15)	-.05	.04		-.04	.04		.05	.04	
P Edu- Some College (Y15)	-.08	.04		-.03	.04		.05	.04	
P Edu- College (Y15)	-.05	.05		-.01	.05		.05	.05	
Constant	2.68	.60	***	3.26	.58	***	10.08	.66	***

Note. Y15 (year 15 wave). BL (baseline wave) M (mother) P (parent). Standardized coefficients and robust standard errors are reported. The interaction results are from separate models where the interaction term was added to the existing model. Reference groups of dummy variables left of out models include Child Gender = Male; Marital Status = Not Married; Child Race = White; Mother Race = White; Mother Education Baseline = Less than High School; Parent Education Year 15 = Less than High School. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Aim 3- The Moderating Role of Schools on ACEs Predicting Mental Health & Well-being (N = 1960)

	Depression			Anxiety			Pos Functioning		
	β	SE	*p*	β	SE	*p*	β	SE	*p*
ACEs Cumul.	.14	.06	*	.04	.05		-.10	.05	+
School Connectedness	-.31	.03	***	-.20	.03	***	.38	.03	***
Cumul. x School	.13	.26		.57	.24	*	-.52	.27	
Child Age (Y15)	-.01	.02		-.02	.02		.02	.02	
Parent Age (BL)	.03	.03		.02	.03		.01	.03	
Income (BL)	.01	.03		.00	.03		-.02	.03	
Income (Y15)	-.01	.03		.01	.03		-.02	.03	
Child Gender- Female	.07	.02	***	.04	.02		-.04	.02	
Marital Status- Married	-.02	.03		-.05	.03		-.01	.03	
Child Race- Black	.01	.08		-.09	.08		.16	.08	*
Child Race- Hispanic	-.01	.05		-.06	.05		.07	.04	
Child Race- Other	.03	.03		-.02	.02		.01	.02	
Child Race- Multiple	.05	.03		.03	.03		.04	.03	
Mother Race- Black	-.05	.07		.02	.07		.01	.07	
Mother Race- Hispanic	.04	.05		.07	.05		-.04	.04	
Mother Race- Other	-.03	.03		.00	.03		-.02	.02	
M Edu- High School (BL)	.02	.04		.01	.04		-.03	.03	
M Edu- Some College (BL)	.00	.03		-.01	.04		-.03	.03	
M Edu-College (BL)	-.02	.04		-.05	.04		-.05	.04	
P Edu- High School (Y15)	-.06	.04		-.04	.04		.06	.04	
P Edu- Some College (Y15)	-.08	.04	*	-.03	.04		.05	.04	
P Edu- College (Y15)	-.02	.05		.01	.04		.02	.05	
Constant	2.88	.59	*	3.38	.58	***	9.87	.65	***

Note. Y15 (year 15 wave). BL (baseline wave) M (mother) P (parent). Standardized coefficients and robust standard errors are reported. + indicates a previously significant coefficient removed after Benjamini-Hochberg corrections. The interaction results are from separate models where the interaction term was added to the existing model. Reference groups of dummy variables left of out models include Child Gender = Male; Marital Status = Not Married; Child Race = White; Mother Race = White; Mother Education Baseline = Less than High School; Parent Education Year 15 = Less than High School. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 12

Aim 3- The Moderating Role of Neighborhoods on ACEs Predicting Mental Health & Well-being (N = 1960)

	Depression			Anxiety			Pos Functioning		
	β	SE	*p*	β	SE	*p*	β	SE	*p*
ACEs Cumul.	.23	.05	***	.11	.05	+	-.20	.05	***
Neighborhood Col. Eff.	-.12	.02	***	-.14	.02	***	.18	.02	***
Cumul. x Neighborhood	.02	.22		.33	.20		.05	.21	
Child Age (Y15)	.00	.03		-.02	.02		.01	.02	
Parent Age (BL)	.04	.03		.03	.03		-.01	.03	
Income (BL)	.00	.03		.00	.03		-.01	.03	
Income (Y15)	-.01	.04		.02	.03		-.02	.03	
Child Gender- Female	.09	.02	***	.05	.02	*	-.06	.02	*
Marital Status- Married	.01	.03		-.03	.03		-.05	.03	
Child Race- Black	.02	.08		-.07	.08		.14	.08	
Child Race- Hispanic	-.02	.05		-.06	.05		.08	.05	
Child Race- Other	.03	.03		-.03	.02		.02	.03	
Child Race- Multiple	.06	.03		.03	.03		.03	.03	
Mother Race- Black	-.06	.08		.00	.07		.01	.08	
Mother Race- Hispanic	.06	.05		.08	.05		-.06	.05	
Mother Race- Other	-.03	.03		-.01	.03		-.02	.03	
M Edu- High School (BL)	.01	.04		.00	.04		-.02	.04	
M Edu- Some College (BL)	.00	.04		-.01	.04		-.03	.04	
M Edu-College (BL)	-.02	.05		-.05	.04		-.05	.05	
P Edu- High School (Y15)	-.06	.04		-.04	.04		.05	.04	
P Edu- Some College (Y15)	-.08	.04		-.04	.04		.05	.04	
P Edu- College (Y15)	-.04	.05		.00	.05		.04	.05	
Constant	2.52	.63	***	3.15	.59	***	10.27	.70	***

Note. Y15 (year 15 wave). BL (baseline wave) M (mother) P (parent). Standardized coefficients and robust standard errors are reported. + indicates a previously significant coefficient removed after Benjamini-Hochberg corrections. The interaction results are from separate models where the interaction term was added to the existing model. Reference groups of dummy variables left of out models include Child Gender = Male; Marital Status = Not Married; Child Race = White; Mother Race = White; Mother Education Baseline = Less than High School; Parent Education Year 15 = Less than High School. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1

The Moderating Effect of School Connectedness on the Association between Cumulative ACEs and Adolescent Anxiety