The Effects of Adverse Childhood Experiences and Resilience on Child Development:

Future Directions in Research, Practice, and Policy

by

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ABSTRACT

In past decades, adverse childhood experiences (ACEs) rapidly gained attention as a public health crisis due to dose-response relationships with a range of health and social problems, and early mortality. Converging studies show that ACEs are a pandemic in the general population of the United States—even in middle to upper-middle class families that are considered to be 'better off'. There have been collaborative efforts in public health to target root-causes of childhood adversity and increase resilient adaptation in individuals and families at risk. Due to the importance of fostering positive adaptation in the midst of adversity, this dissertation sought to examine both vulnerability and protective factors in children's proximal ecology—e.g., parents and caring adults at school. A population-based study in this dissertation revealed that parents' emotional well-being, measured as negative feelings toward parenting, greatly influences developing children, so as support and resources for parenting. The presence of caring adults as a protective factor in teens with highly competitive settings—a newly identified at-risk group due to high pressure to achieve and internalizing/externalizing problems. Lastly, this dissertation discusses conceptual and methodological limitations in current ways of measuring ACEs and provide future directions for research, practice, and policy. Suggestions include frequent assessments on reaching consensus on how to define ACEs, expanding the concept of ACEs, considering the duration, timing, and severity of the event. Healthcare professionals have important roles in public health; they incorporate frequent assessments on parents' emotional wellbeing and needs for parenting as a part of care. Ongoing support from multiple disciplines is necessary to reduce the impact of ACEs and strengthen resilience development of children and families.

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

Figure Page

CHAPTER 1

CHILDHOOD ADVERSITIES AND RESILIENCE: THE SIGNIFICANCE IN PUBLIC HEALTH

"All the world is full of suffering. It is also full of overcoming,"—Helen Keller

In recent years, adversities—experienced particularly in childhood—have gained more attention in research and practice. Adverse childhood experiences are defined as events that are 'potentially traumatic' and occur before the age of 18 years, which include the forms of violence, abuse, and family dysfunctions (Centers for Disease Control and Prevention [CDC], 2019). The CDC report (2019) states that 61% of adults in the United States experienced at least one ACE while growing up, whereas 16% experienced four or more ACEs—with higher rates existing in females and racial/ethnic minorities. However, a recent study with students growing up in middle to upper-middle class also show high rates of childhood adversity (Luthar et al., 2021). More importantly, with the outbreak of COVID-19, there are concerns over parenting stress due increased childcare burdens and pandemic-related stress which then have led to an increase in childhood adversity (Calvano et al., 2021).

Converging evidence shows that cumulative exposure to ACEs increase negative health outcomes due to the brain's prolonged stress response—which is also described as dose-response relationships (Kalmakis & Chandler, 2014; Shonkoff & Garner, 2012). The higher number of ACEs one has experienced, the likelihood of disease diagnoses and early mortality increases. The California Surgeon General's Report on ACEs (Bhushan et al., 2020) states that such health outcomes include illicit drug use, depression, suicide, and a range of physical illnesses (e.g., heart disease and diabetes). Because of this, 9 out of 10 leading causes of death in the United States have associations with ACEs. The financial costs in healthcare services that are associated with the public health outcomes

with childhood adversity are approximately $748 billion per year in North America (Bellis et al., 2019).

There have been collaborative efforts to prevent the deteriorating effects of ACEs in primary care settings. In California, for example, the enactment of SB 428, called the ACEs Equity Act, is set to expand the current practice of ACEs screening and referrals by providing trainings, screening tools, protocols, and payment on and after January 1, 2022. So far, more than a half million individuals have been screened by Medi-Cal providers in the state since 2020 (Rooney, 2021). Also, the multisector, community-based networks (e.g., ATR networks) has become more popular to not only address childhood adversity and trauma but also help improve resilience (Rog et al., 2021). Such networks provide individuals from multiple disciplines with opportunities to collaborate in a range of organizations and communities.

The concept of ACEs, however, lacks congruence among researchers; this issue has brought up several methodological concerns in terms of how ACEs are currently measured (which will be discussed in Chapter 4). Also, while adversities in low-income communities are well-reported in literature, less is known about risks to resilience development among youth in middle- and middle-to-upper income communities (which will be discussed in Chapter 3). Of note, youth in high achieving schools (HASs) in middle- to upper-middle class as a new at-risk group, so is pressure to succeed is now addressed as a major risk factor for youth health and wellness (Geisz & Nakashian, 2018). Excessive pressure to succeed is frequently associated with internalizing problems and substance use, particularly in HASs (Luthar et al., 2020). Such links have been supported by consistent evidence on moderate effect sizes of achievement pressure in the models predicting the maladjustment indicators. Constant comparisons among peers and lack of quality time with parents may contribute to increased adjustment problems

in this group. Importantly, a recent study by Luther et al. (2021) revealed that individuals in HASs also reported the exposure to ACEs, which is comparable to results from other ACEs studies. Yet, more research is needed to examine factors relating to adjustment problems among this youth.

Lastly, another central concern in this dissertation is resilience. Resilience is defined as "a dynamic process encompassing *positive adaptation* within the context of significant *adversity*" (Luthar et al., 2000). Past research show that there are large proportions of people who do not develop clinically significant health problems despite their retrospective reporting of childhood adversity (Anda et al., 2010; Hillmann et al., 2016). Furthermore, there is a wide variation in developmental outcomes in which a considerable proportion of people develop positive adjustment following an adverse experience (Haskett et al., 2006). It is because each individual can have a different amount of available resources (e.g., close parent-child relationships and peer support) and the ability of the individual to utilize them varies as well (Cicchetti, 2013). Just as it is important to study the effects of adversity on health, it is also imperative to explore what constitutes positive adaptation following the exposure to adversity. Therefore, this dissertation discusses childhood adversity—which has been addressed as a public health crisis and a significant contributor to multiple health problems—and resilience factors that facilitates adaptation to adversity.

Conceptual/Theoretical Foundation of Adversity and Resilience

Adversity refers to *a high-risk condition that carries high odds for measured maladjustment in critical domains* (Luthar et al., 2015). To illustrate, examining whether an environmental factor is a significant adversity involves a series of statistical testing on a link between the potentially harmful factor and maladjustment indicators, such as internalizing and externalizing problems. Past work on risk and adversity

focused on a single adversity, such as parental divorce, bullying, and discrimination (Larkin et al., 2014). In the mid 1990s, however, Felitti and colleagues found statistically notable links between the accumulative exposure to childhood adversities and pathological diagnoses (Felitti et al., 1998). Following the pioneering work by Felitti and colleagues, more studies showed that cumulative effects of childhood adversities share notable statistical variances with physical and psychological symptoms and early mortality by up to 20 years (e.g., Huges et al., 2017). Such findings provided strong evidence supporting the public health significance of multiple exposures to early life adversities.

In addition, the effect of maltreatment can have a cascade effect on human development with a greater magnitude of impact in earlier stages of development (Masten & Cicchetti, 2010)—called developmentally *sensitive periods*—wherein adversities can cause life-long impairments in cognitive, emotional, and executive functioning (Kim-Cohen, 2007). Because neurological structures gradually develop, especially during the first five years of life, intolerable amounts of stress at this time can cause life-lasting effects on the neural structures of the developing brain (Shonkoff & Garner, 2012). Likewise, the younger a person is, the more he or she depends on the main caregivers to meet basic needs such that, physical/emotional neglect (i.e., failing to meet physical/emotional needs) is more detrimental for infants than adolescents who already had developed some capacities for self-care. Thus, the cost of maltreatment in early stages of life can be much greater (Luthar et al, 2015).

When an adversity indicates a condition that has high probabilities of consequent maladjustment, positive adaptation means adjusting to an adverse situation and results in 'better-than-expected' outcomes. Given the associations between aforementioned adversities and maladjustment, there is also a notable amount of findings showing a

subset of individuals who show positive adaptation to stressful life events (Luthar et al., 2000). In early work of developmental science, those who experienced maltreatment but did not develop pathological outcomes were considered as 'invulnerable' to stressors (Anthony, 1974). Then, a plethora of past studies on positive adaptation brought several paradigms shifts in the literature (Luthar et al., 2015). One of the major changes involves the way to ascribe individuals who show positive adaptation as being *resilient*, rather than being *invulnerable*; another change is that resilience represents an ever-changing process of adjustment across diverse contexts, rather than a fixed outcome.

According to a conceptual paper by Luthar et al. (2015), there are three distinct ways to view resilience in developmental psychology: 1) as a *personal trait* (such as 'resiliency' [Gerrard et al., 2004)]), 2) as an *outcome,* and 3) as a *process* of adaptation. As mentioned earlier, there are limitations in viewing resilience as a unchangeable trait. If resilience is a personal trait, for example, one may misunderstand that individuals have sole responsibilities to show adaptative functioning in the face of adversity. The second perspective (i.e., resilience as an outcome) does not fully account for the fact that resilience is not fixed but malleable, depending on contexts and developmental stages. In fact, individuals who failed to show adaptive functioning during childhood may develop capabilities to deal with stressful situations in adulthood—if necessary resources are provided to correct maladjustment during adolescence (Topitzes et al., 2013).

Therefore, this dissertation will be based on the third perspective of resilience (i.e., "a dynamic process encompassing *positive adaptation* within the context of significant *adversity*"; Luthar et al., 2000). Indeed, there are several considerations in research when one decides what to include as the indicators of positive adaptation, given varying degrees of adversity. For low-risk children, one may see 'being successful in completing everyday life tasks' as a positive outcome, whereas the absence of severe

psychopathological problems is the primary aim for high-risk children (Luthar et al., 2015). Positive adaptation should also be relevant to the age of an individual because various developmental stages entail age-appropriate tasks. It makes an intuitive sense to expect the ability to follow through a brief instruction for a toddler, and complex problem-solving skills and altruistic prosocial behaviors that require high executive functioning for an adolescent.

Research Questions

1. Would ACEs and parental aggravation be associated with children's adjudgment (i.e., perseverance and emotional regulation) and maladjustment (i.e., internalizing and externalizing problems) with larger magnitude of associations for the aggravation?

   1a. Would personal support (i.e., from spouse, family member, close friend) and external resources (e.g., from peer support group, healthcare professional, place of worship) moderate the effect of ACEs and parental aggravation on child outcomes?
2. To what extent would school climate (i.e., caring adults and diversity at school) contribute to intrinsic aspirations with regard to community, relationships, and personal growth, within high school students at HASs?

   2a. To what extent would the constructs of intrinsic aspirations be associated with one another?
3. What are conceptual and methodological considerations, given the existing ACEs literature, as well as associated implications for future research and practice?

Relationships among Chapters

Chapter 2 focuses on the impact of ACEs and parental emotional wellbeing on children's adjustment and maladjustment indicators, as well as the potential moderating effects of personal support and external resources for parenting. For this chapter, a population-based data from the 2016-2017 National Survey of Children's Health were utilized to ensure an adequate sample size and to test the research question in a general population—after controlling for demographic variables. What was also uniquely investigated in this chapter, compared to past research, is the *parents' emotional wellbeing*, measured as 'parental aggravation' due to parenting. Parents have salient roles in the health and development of children, and their emotional wellbeing should not be overlooked in caring for children with adversity. Comparing the magnitudes of effects of parents' aggravating feelings toward their children and childhood adversity, the chapter may provide insights in future research and practice. In addition, the moderating roles of two different types of resources (i.e., personal support from proximal relationships and external resources for parenting) show whether the presence of support for parenting significantly change the likelihoods of children's adjustment despite ACEs and parental aggravation.

Chapter 3 discusses intrinsic aspirations of teens in HASs—who grow up in highly competitive settings and considered as a newly identified at-risk group (Geisz & Nakashian, 2018). In resilience research, it is important to investigate positive adjustment outcomes, such as motivations to develop self, relationships with others, and communities. Supportive relationships with adults at schools, other than parents, can be a protective factor to foster positive adjustment in teens in stressful environments. This chapter seeks to answer the research question regarding the extent to which having caring adults (e.g., teachers, advisors) have associations with dimensions of intrinsic

aspirations in three different HASs, compared by gender and school. In order to examine the independent effect of caring adults, the statistical model controlled for other school climate indicators, such as diversity, and relationships with parents and friends.

Chapter 4 mainly focuses on the overview of past literature on ACEs, limitations of the current state of science, and recommendations for future research. As discussed earlier, the definition of ACEs has not reached consensus among researchers and practitioners. Despite the significance of previous findings regarding dose-response relationships with ACEs and health problems, its nascent concept and methodological concerns in ACEs hinder effective communications. Several researchers noted the needs of more scientific work in clarifying and expanding the concept—by revisiting the operational definition of the ACEs (Portwood et al., 2021) and modifying the criteria in the current ACE measures to address adversities at the societal and cultural levels (e.g., discrimination; Cronholm et al., 2015). Furthermore, the current scheme of measuring ACEs centers around the conventional 10 binary items (yes/no) that asks whether one has had an experience with each of the core components of the concept (i.e., physical/emotional abuse/neglect, and household dysfunctions). However, this method does not account for timing, varying severity, and duration of an adversity, which are important features to consider when determining the appropriate expected outcome of adjustment. This chapter highlights future directions for research on ACEs that center around the conceptual and methodological limitations.

Finally, Chapter 5 discusses an overarching conclusion of the three chapters summarizing main findings and providing the implications for practice and policy in protecting children and families with adversity. It is well-recommended in literature to increase the understanding of healthcare professionals regarding protective factors that are applicable in real world strategies (Thompson & Klika, 2015). It is also imperative to

advance public health practice to reduce the effects of ACEs, particularly through a larger-scale implementation. Rog et al. (2021) stated that professionals from various disciplines work together for multi-sector, community-based networks not only to address ACEs but also to foster resilience. In primary care, rigorous research on childhood adversity and resilience can inform healthcare practitioners and parents to secure protective growth environments for children at risk.

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CHAPTER 2

PARENTAL AGGRAVATION MAY TELL MORE ABOUT CHILD'S MENTAL/BEHAVIORAL HEALTH THAN ADVERSE CHILDHOOD EXPERIENCES: USING THE 2016 NATIONAL SURVEY OF CHILDREN'S HEALTH

Recently, a major report from the National Academy of Science, Education, and Medicine (NASEM, 2019) emphasized that adverse childhood experiences (ACEs) are major contextual factors that impede positive development in youth. The term ACEs represents a broad concept encompassing physical/emotional abuse, neglect, and household dysfunctions that occur during one's childhood (Kalmakis & Chandler, 2014; NASEM, 2019). In the United States alone, 47.9% of children under the ages of 18 have reported at least one ACE; 22.6% had two or more ACEs (Bethell et al., 2017).

Mounting evidence has confirmed the dose-response relationships of ACEs with a variety of health problems (Felitti et al., 1998), such as anxiety (Poole et al., 2017), depression (Wingo et al., 2010), asthma, headaches, and digestive problems (Bellis et al., 2018). Early negative life experiences have a prominent impact on one's likelihood of deviating from healthy developmental trajectories and susceptibility to diseases throughout the life course. Childhood adversity can lead to intolerably high levels of stress called *toxic stress* in the human body (NASEM, 2019; Shonkoff & Garner, 2012). In response to toxic stress, a child's malleable brain can undergo hypertrophy and overactivity in the amygdala, hippocampus, and prefrontal cortex, which then rewire neurological structures. This change in brain structure and activity can be associated with lifelong impairments in emotional regulation, learning, behavior, and overall health (Shonkoff & Garner, 2012).

As indicated by the NASEM (2019) report, titled *Vibrant and Healthy Kids: Aligning Science, Practice, and Policy to Advance Healthy Equity*, a major task for

contemporary researchers is to illuminate factors that substantially reduce the ill-effects of negative life experiences, or maximize resilient adaptation. The construct of resilience is defined as "a dynamic process encompassing positive adaptation within the context of significant adversity" (Luthar et al., 2000). The central task of resilience researchers is to identify processes that foster adaptation in spite of adversity (Hostinar & Miller, 2019), with special attention to those processes that have strong effect sizes, and are amenable to change via interventions (Luthar & Eisenberg, 2017). The implications of resilience for the ACEs literature are that some at-risk children are able to withstand the effects of toxic stress without developing serious problems. Thus, it is important to illuminate major factors that distinguish those who show resilient patterns of adaptation as opposed to those who falter.

Parents' Aggravation around Parenting and the Critical Importance of Support

Reviewing accumulated evidence over the past decades, Luthar and Eisenberg (2017) reported that particularly deleterious for child outcomes are parental indices connoting harshness and anger. Among children who are at risk for negative life experiences, the goal is to "minimize toxins and maximize nurturance in children's socializing contexts, targeting the most important, malleable processes in their everyday environments" which are the familial environments (i.e., primarily caregivers; Luthar & Eisenberg, 2017, p. 345). Contemporary studies converge in emphasizing the critical importance of caregivers' well-being—usually mothers—in fostering children's well-being in the face of adversity (Masten & Barnes, 2018; NASEM, 2019; Rutter, 1987). Relatedly, the quality of parent-child relationships is strongly influenced by the current emotional health of caregivers. Parents who are stressed and depressed are at risk for negative

thoughts and behaviors toward their children, which in turn greatly exacerbates the risk for children's maladjustment (Goodman & Garber, 2017).

Caregivers who are at risk for negative feelings in the parenting role can be helped considerably if they have strong, reliable support systems. Literature reviews spanning different types of adversities have documented benefits of support for mothers' own wellbeing and their parenting (Goodman & Garber, 2017; Luthar & Ciciolla, 2015; Luthar & Eisenberg, 2017). Intervention research also has shown substantial benefits to mothers in medical profession who are at risk for stress and burnout, following the provision of such ongoing support (e.g., Luthar et al., 2017; see also Luthar et al., 2019). Morris and colleagues (2017) suggested that positive parenting interventions for distressed parents affect child outcomes through two mechanisms: 1) building social support for parents; and 2) fostering positive interactions between parents and their children. Evidence-based interventions that extend their target population from parents to families are critical in strengthening social support for parents, thus promoting parents' wellbeing, positive parenting behaviors, and children's adjustment (Sanders, 2008).

Limitations in the ACEs Literature: Attention to Parents Contemporaneous Affect

Despite the high conceptual significance of negative feelings in the parenting role, studies focused on the construct of ACEs have not directly assessed mental health of parents. Most commonly used ACE measures in studies (e.g., Kaiser Permanente study; Felitti et al., 1998) treat mental illness of people in the household as one of 9 items with all of these weighted equally when calculating the cumulative ACEs scores. Such limitations in literature on ACEs might lead to misleading implications among stakeholders that parents' mental illness is equivalent to other items on ACEs measures,

such as the occurrence of divorce at some time since the child's birth. Also, due to the nature of ACE questions, the focus is on the history of adversity, such that it is difficult to know if the history of parents' negative mental health was still an ongoing problem at the time of survey.

Summary and Hypotheses

Given the literature discussed, the goal in this study was to compare associations of both cumulative ACEs, and contemporaneously assessed parental aggravation, with multiple child adjustment outcomes. Child outcomes encompassed both maladjustment—including lifetime diagnoses of internalizing problems (anxiety and depression) and externalizing ones (attention-deficit/hyperactivity disorder, and behavioral/conduct problems)— as well as indices of positive adjustment: perseverance in the face of challenges (Duckworth et al., 2007) and capacities for emotional self-regulation (Eisenberg & Sulik, 2012). In relation to each outcome, we also examined the potential moderating roles of personal support from family and close friends and external resources for parenting. As associations between family functioning indices and child outcomes frequently vary by gender (Lewis et al., 2015), all analyses were conducted separately for boys and girls.

Hypotheses tested were: (H1) ACEs and parental aggravation would each predict children's maladjustment and positive adjustment, with larger magnitude of associations for the aggravation; (H2) personal support (i.e., from spouse, family member, close friend) and external resources (e.g., from peer support group, healthcare professional, place of worship) would moderate the predictive effect of ACEs and parental aggravation on child outcomes.

Methods

Participants and Procedure

The study sample was derived from the 2016 National Survey of Children's Health (NSCH), a US population-based, cross-sectional survey administered between June 2016 and February 2017 by the US Census Bureau (CAHMI, 2018). Parents from randomly selected households with one or more children received a mailed invitation asking for participation online or via mail. Questions covered a variety of areas relating to children's physical and psychological health and quality of care received, as well as determinants of health in the context of family, community, and school. A total of 50,212 adult caregivers/parents with a child under the ages 18 years participated in the 2016 NSCH. Given the focus on children's internalizing and externalizing diagnoses in this study (and the fact that survey measures of perseverance and emotional regulation were different for children 0 to 5 vs. 6 to 17 years old), the present analyses focused only on 6-17 year olds. Cases that were missing and had children ages 0 to 5 years old were excluded, which left the total analysis population with 35,718 cases from non-institutionalized children in all 50 states in the United States.

Measures

Adverse Childhood Experiences (ACEs)

In the 2016 NSCH survey, ACEs were measured by 9 items addressing: 1) financial hardship in household, 2) separation/divorce of parents/guardians, 3) death of parents/guardians, 4) incarceration of parents/guardians, 5) witnessed domestic violence, 6) became a victim of or witnessed violence in neighborhood, 7) lived with anyone who was mentally ill, suicidal, or depressed, 8) lived with anyone who had a problem with substance use, and 9) experienced discrimination due to race/ethnicity. Response options were yes/no, except for the first item (i.e., financial hardship in

household) in which manual instructions are to combine responses 'somewhat often' and 'very often' to be comparable to the other binary items (CAHMI, 2018). After applying the dichotomizing procedure, a sum score of ACEs endorsed was calculated with each item given equal weight. As noted earlier, this is a common method used in research examining relations between ACEs and children's health (Bellis et al., 2018; Kwong & Hayes, 2017; Moore & Ramirez, 2016). Cronbach's alpha for this measure was 0.66 in males and 0.67 in females in this study.

Parental Aggravation

The 2016 NSCH survey included 3 items relating to parental aggravation that asked, "During the past month, how often have you felt: 1) that this child was much harder to care for than most children his or her age?; 2) that this child does things that really bother you a lot?; and 3) angry with this child?" For each item, participants answered based on the following options: *never, rarely, sometimes, usually*, and *always*. As recommended in the manual procedures (CAHMI, 2018), a binary indicator of parental aggravation was created in which any case where a participant had given at least one *usually* or *always* response on any of the three items was considered to be the target group of parents identified as experiencing parental aggravation (0 = "parent seldom feels aggravation from parenting" and 1 = "parent usually/always feels aggravation from parenting"). Cronbach's alpha for the three items in this measure was 0.81 in males and 0.79 in females in this study sample.

Personal Support and External Resources

The 2016 NSCH measured day-to-day emotional support for parenting by asking a series of questions starting with "during the past 12 months, was there someone that you could turn to for day-to-day emotional support with parenting or raising children?"

If a participant gave an affirmative response to the first question, the following questions then asked to identify the source(s) of support.

For personal support, as the manual procedures (CAHMI, 2018) recommended using binary indicators of support, we used two binary items asking whether support was provided by spouse, and by other family members/close friends. The variables were summed, ranging from 0 to 2, and then dichotomized to create the indicator of personal support (i.e., 0 = children living with parents who had no day-to-day *personal support* for parenting; 1 = children living with parents who had at least one person to turn to for day-to-day *personal support* for parenting). Cronbach's alpha was 0.66 for both males and females in this study.

For external resources, six items asked whether participant received support from healthcare provider, support or advocacy group related to specific health condition, peer support group, counselor or other mental health professionals, place of worship or religious leader, and other person. The variables were summed, ranging from 0 to 6, and then dichotomized per manual recommendation to use a binary indicator. The indicator for external resource was coded as 0 = children living with parents had no *external resource* of day-to-day emotional support for parenting; and 1 = children living with parents had at least one *external resource* to turn to for day-to-day emotional support for parenting. As there is no conceptual reason that help seeking from one external resource would imply help-seeking from all others as well. Cronbach's alphas were not expected to be high (they were 0.52 in males and 0.52 in females in this study).

Internalizing/Externalizing Problems

The 2016 NSCH asked participants if healthcare providers had told them that their child had each of the following mental problems –anxiety, depression, attention-deficit/hyperactivity disorder (ADHD), and behavioral/conduct problems. The

questionnaires were adapted from the Children with Special Health Care Needs Screener in the previous 2011/12 NSCH survey. Response options were consisted of *"Did not have condition," "Ever told, but do not currently have condition,"* and "*Currently have condition*." Each item was recoded, collapsing the last two responses to a dichotomous variable, ranging from 0 (i.e., Did not have condition) to 1 (i.e., Child had a lifetime diagnosis). For the main analysis of this study, items of anxiety and depression were summed to create an overall indicator of internalizing problems; items of ADHD and behavioral/conduct problems were summed to create an indicator of externalizing problems.

Perseverance and Emotional Regulation

Two items in the 2016 NSCH ("child finishes tasks and follow through with plans," and "child stays calm and in control when faced with a challenge"; see Kwong & Hayes, 2017) measured perseverance and emotional regulation. Responses to each question ranged from 0 to 2 (i.e., *not true, somewhat true, definitely true)*, according to the manual (CAHMI, 2018).

Covariates

Variables related to child and parent's characteristics—which included age, race, the highest level of education in the household, and family structure—were treated as covariates in the main analysis. After dichotomization, race was recoded as 1 (i.e. non-Hispanic white) and 0 (i.e. other); parent education level was recoded as 1 (i.e. college degree) and 0 (i.e. no college degree); and, parent marital status was recoded as 1 (i.e. two parents) and 0 (i.e. single parent/other).

Statistical Analyses

Descriptive analyses were performed to examine the characteristics of our sample population. Then, bivariate correlations explored associations between variables used for

the main analyses. To test the study hypotheses, hierarchical multiple regression analyses were performed to explore links between predictors and dimensions of children's maladjustment (i.e., internalizing and externalizing problems) and adjustment (i.e., perseverance and emotional regulation), separately in each subgroup of males and females. Model 1 included only covariates (child's age/race, parent's sex/education level, and parent's marital status), Model 2 tested main effects of ACEs and parental aggravation, and Model 3 tested main effects of moderators (i.e., personal support and external resources). Finally, the interaction terms—which represented potential moderator effects—were tested in Model 4. $P < 0.05$ was taken as significant. All analyses were conducted by using SPSS version 25 (IBM Corp, 2017).

Results

Descriptive Statistics

Characteristics of the sample population are shown in Table 1. The sample represents middle and upper-middle class families with a male or female child who was approximately 12 years old, mostly on average. The majority of children were non-Hispanic white and had two parents whose highest education was a college degree. The mean of ACEs score was 0.89 (SD = 1.34) for males and .92 (SD = 1.38) for females. Figure 1 represents the percentages of the population sample that reported each type of ACEs. The most commonly identified ACEs were parental divorce/separation (26.4% in males; 27.5% in females) and socioeconomic hardships (20.3% in males; 19.5% in females).

In Table 2, bivariate correlations among variables are presented. As expected (and indicating validity of measures involved), child maladjustment indices of internalizing and externalizing problems had positive correlations with both ACEs and

parental aggravation, while the positive adjustment indices, perseverance and emotional regulation, showed negative correlations in each case.

Regression Analyses

The fully adjusted hierarchical regression model predicting to internalizing problems explained 15.1% of the variance in males and 15.4% of the variance in females. Similarly, the model for externalizing problems explained 19.9% and 17.6% of the variance in males and females, respectively. The model for perseverance accounted for 14.5% and 12.3% of the variance in males and females; the model for emotional regulation accounted for 18.7% and 12.4% of the variance in males and females, respectively.

Main Effects

In Model 2 (see Tables 3-6), ACEs and parental aggravation significantly and independently predicted psychological maladjustment and adjustment of children. In general, ACEs and parental aggravation had positive associations with maladjustment; children with parents who reported higher ACEs and parental aggravation had higher maladjustment. As hypothesized, standardized beta coefficients of parental aggravation were larger that of ACEs in males than females, across all four outcomes—with one exception in the model with internalizing problems in females. In order, the relative magnitudes of beta coefficients for aggravation over ACEs, in predicting to internalizing, externalizing, perseverance, and emotional regulation respectively among males, were (*β'S* .28/.19 =) **1.47**, (*β'S* .35/.20 =) **1.75**, (*β'S* -.29/-.15 =) **1.93**, and (*β'S* -.31/-.17 =) **1.82**. In females, these relative magnitudes in the same order were (*β'S* .21/.22 =) **.95**, (*β'S* .33/.18 =) **1.83**, (*β'S* -.24/-.17 =) **1.41**, and (*β'S* -.25/-.19 =) **1.31**. Overall, therefore, in seven of the eight comparisons examined, links were almost one and a half to two times as strong for parent aggravation than for ACES.

According to the guidelines for evaluating effect sizes for social science research (Ferguson, 2009), results showed that (after having controlled for covariates and ACEs), parental aggravation had minimum to moderate effect sizes in relation to externalizing problems among males and females (β = 0.35 and β = 0.33) and also in relation to emotional regulation in males (β = -0.31). By contrast, effect sizes of ACEs stayed within the 0.15-0.22 range which is smaller than or slightly over the recommended minimum effect size of .2. The findings together partially supported the first hypothesis.

Interaction Effects

As illustrated in Model 4 (see Tables 3-6), a number of significant interaction effects were present between predictors and the hypothesized moderators; Figures 2 and 3 show the nature of these interactions. As expected, the effects of ACEs were generally weaker in the presence of personal support for parenting (Figure 2). The interactions between parental aggravation and personal support was less often statistically significant; this interaction was significant in only one case, wherein the presence of personal support attenuated links between aggravation and males' internalizing problems.

The presence of external resources was found to be significant in several interaction terms, involving both ACEs and parent aggravation. In all cases, high external resources were linked with relatively *poor* child adjustment, with increasing scores of both ACEs and parent aggravation. For example, as shown in Figure 3, child internalizing and externalizing problems were more prominent when parents were aggravated and reported the presence, as opposed to the absence, of external resources.

Discussion

A substantial body of literature has shown notable associations between childhood adversity and a variety of health problems and well-being in children (Kwong

& Hayes, 2017; Moore & Ramirez, 2016) and adults (Briggs & Price, 2009; Felitti et al., 1998; Shonkoff & Garner, 2012). Yet, the majority of ACEs studies focused on different aspects of children's adjustment, while the emotional functioning of parents—which significantly affects children's development (Luthar & Eisenberg, 2017; NASEM, 2019)—has not gained as much attention. Our study fills current gaps in the literature of childhood adversity by examining the unique contribution of both lifetime ACEs, and contemporaneous parental feelings of aggravation, in predicting children's maladjustment and adjustment. Additionally, our findings show buffering effects for personal support but not support from external sources; in fact, the latter was linked with greater child problems in the presence of high childhood adversity.

Adverse Childhood Experience and Parental Aggravation: New Effects

The findings of this study showed a clear, significant effect of ACEs on children's internalizing/externalizing behaviors, perseverance, and emotional regulation. This is congruent with previous findings based on the 2011/2012 NSCH data (Kwong & Hayes, 2017; Moore & Ramirez, 2016). This study also confirmed the presence of dose-response tendencies between ACEs and emotional/behavioral health, where more ACEs are associated with higher emotional and behavioral health problems.

Different types of severe adverse experiences are more likely to co-occur, rather than occur in isolation. This was evidenced in our sample, where approximately 45% of children ages 6-17 years experienced at least 1 ACEs and more than 5% experienced 4 or more ACEs. Certain types of ACEs were more prevalent than others (see Figure 1); more than one fifth of children in the study had experienced parental divorce/separation and socioeconomic hardship, respectively.

As expected in the primary hypothesis of this study, the main effects of parental aggravation were considerably larger than the main effect of ACEs, after controlling for

covariates and ACEs. This pattern was consistent in seven of the eight comparisons appraised, across gender and outcome. Among boys, as compared to the beta coefficients for ACEs, coefficients for parental aggravation in predicting to the four outcomes were **1.47** (internalizing problems), **1.75** (externalizing problems), **1.93** (perseverance), and **1.82** (emotional regulation) as large. Among girls, these relative strengths were 0.95 (internalizing problems), **1.83** (externalizing problems), **1.41** (perseverance), and **1.31** (emotional regulation).

In terms of family dynamics, the strong associations involving parental aggravation can be explained in at least two ways. First, children may model the negative behaviors they observe their parents engaging in, such as aggravated parenting practices. Through social learning theory, intergenerational transmission of aggressive behaviors may occur because children often learn their parents' behaviors through observation (Bandura, 1973). Second, overly stressed parents are also more likely to engage in unhealthy parent-child interactions, subsequently causing increased distress in their children. Children may, in turn, begin acting out and showing higher levels of behavior problems.

It is also plausible that these negative interactions are bidirectional in nature, wherein a child's problem behaviors exacerbate their parents' feelings of aggravation, and vice versa. This is known as the coercive cycle of parenting (Patterson, 2002). In a study with adolescents ages 12 to 18, parents who were aggressive toward their children tended to also experience violence from their children; a child's delinquency worsened parent-child relationships, simultaneously (Ibabe & Bentler, 2016).

Last, aside from family dynamics, there could also be a possible genetic link of emotions between parents and their child. Harold and colleagues (2017) argued that a 'spillover' of emotion from distressed parents to children with internalizing/externalizing

behaviors is indicated by 3 assumptions in genetics research: 1) genetic propensities shared among parents and children, rather than environmental effects, can cause children's problem behaviors 2) children's own genetic factors induce disrupted parental relations, and 3) inherited aspects of child behavior and environmental influences (e.g., poor parenting and parental relations) can have gene-environment interactions.

The Moderating Role of Personal Support and External Resources

In moderating the effects of ACES, the buffering effects of personal support for parenting from someone close (i.e., spouse, other family member, close friend) worked in the expected direction in our sample, particularly in relation to child maladjustment. In other words, the effects of ACEs on children's maladjustment tended to be less pronounced in the presence of parents' personal support than in its absence; these findings were consistent among male and female children. Given that a majority of our participants were mothers, the findings regarding personal support were consistent with previous research on the critical importance of 'emotional support' for female caregivers (Luthar & Ciciolla, 2015; Luthar et al., 2019).

The magnitude of interactions between parental aggravation and personal support was less pronounced than we had expected. In the literature, it is commonly noted that hostility and aggravation are potent predictors of child maladjustment (i.e., "bad is stronger than good"; Baumeister et al., 2001). Thus, it is possible that parental aggravation is so powerful that even the presence of support does not override or compensate for strong, self-reported negative feelings from mothers toward their own children.

Unexpectedly, with external resources as a moderator, children's maladjustments tended to be even *more* pronounced in the presence of high ACEs scores and parental aggravation. These findings are unlikely to imply that external resources worsen

children's problems. Instead, as suggested earlier, the results might mean that parents are more likely to seek external resources when significant problem behaviors rise to the level of psychiatric diagnoses in their children. At the same time, parents are less likely to feel the need to seek out extra help when their children do not show clinically significant problems.

Strengths and Limitations

To the authors' knowledge, this study is the first national level study to systematically examine overall strengths of links between contemporaneous parental aggravation, as opposed to lifetime ACEs, on children's adjustment, as well as the moderating roles of personal support and external resources. The study included a large sample size with participants randomly selected from all 50 states in the United States, which minimized potential biases of study findings. The NSCH is the only population sample existing in the United States that measures ACEs, health and well-being of children, and family functioning—which includes measures for parental aggravation (Balistreri & Alvira-Hammond, 2016). Annually updated data through the survey represent the most recent trends in the general population of the United States.

Limitations of this study include lack of generalizability, with a sample of mostly non-Hispanic white, upper-middle class households. It is possible that exposure to and ramifications of ACEs are stronger among children from low-income communities of mostly ethnic minorities (see Bethell et al., 2017; Caballero et al., 2017). Second, the NSCH data set was based on cross-sectional design, which precludes any conclusions about causality. Duration and severity of childhood adversity were not well-captured in the binary ACE items, as lifetime diagnoses do not reflect the recency of a child's problems, nor were they verified independently. Parents' reporting of their children's past history of ACEs may have caused a potential bias in this study, as well, as previous

research has suggested some inconsistencies in retrospective report of childhood trauma (Colman et al., 2016).

Last, there are some limitations of measures used in the 2016 NSCH survey. To begin with, the measure for ACEs did not cover all relevant dimensions; physical and emotional abuse/neglect and sexual abuse were not assessed as a part of the measure (CAHMI, 2018). Internalizing and externalizing problems were also sum scores of items in which each of the items corresponded to one symptom. As has been noted in the past, assessments in the NSCH needed to be kept simple to ensure feasibility of completion at a population level (Balistreri & Alvira-Hammond, 2016; Moore & Ramirez, 2016).

Implications for Future Research and Practice

Despite its limitations, this study provides salient implications for future research and practice. With regard to research, it would be helpful for studies to consider: 1) implementing longitudinal designs investigating changes in children's adjustment, in response to overall childhood adversity and parents' contemporaneous aggravation; 2) exploring how health outcomes vary by different severity and duration of risk exposure; and 3) utilizing a qualitative or mixed methods approach, allowing researchers to contextualize lived experiences of children and families, which are not easily captured in quantitative-only studies.

With regard to practice, current ACEs-related interventions, such as trauma-informed programs (Oral et al., 2016), may maximize their potential if they expanded target populations not just to children at but to their primary caregivers (Goodman & Garber, 2017; Luthar et al., 2017; Luthar & Eisenberg, 2017; NASEM, 2019). Securing emotional support for parenting can be even more necessary for distressed families because ACEs—for example, parental divorce, substance abuse, domestic violence—tend to have ill-effects on all in the household, that is, not just children, but also parents.

Additionally, rather than only focusing on cumulative scores on ACEs (major events at any time in the child's life), from a prevention standpoint, it could be as or more useful to focus on parents' who struggle with anger toward the child, as these tend to affect children more directly and strongly.

With these factors in mind, it would be useful for healthcare professionals to ask parents about emotional experiences regarding parenting and availability of supports, in addition to ACEs screenings, during child wellness visits as a part of routine care (NASEM, 2019). Given the significant moderating roles of personal and external support for parenting in our study, what is urgently needed is to ensure that there is ongoing support for all caregivers in at-risk populations, especially those who contend with negative feelings and behaviors toward children (Luthar & Eisenberg, 2017). There is great preventive potential if parents at risk are directed to interventions or resources that help build supportive, nurturing environments for them; these would minimize negative emotions and thus protect both children and their parents from household dysfunction (NASEM, 2019).

Conclusion

In sum, our study revealed that as compared to cumulative ACEs, contemporaneous parental aggravation consistently had larger effects on children's maladjustment. Personal support for parenting attenuated the relations of both ACEs and parental aggravation with children's maladjustment. In the presence of external resources for parenting, children's maladjustments tended to be even more pronounced, suggesting that parents seek external resources when problem behaviors become significant in their children. Overall, the results suggest that the most effective, yet underdeveloped interventions are the ones that tackle 'toxic contemporaneous and

proximal environments', directly addressing high negative affect and associated negative parenting behaviors, toward minimizing intergenerational disparities in well-being.

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Table 1. Participant Characteristics (Total N = 35,718)

	Male (N = 18,226)				Female (N = 17,492)			
	M	± SD	N	(%)	M	± SD	N	(%)
Child age (years)	12.12	± 3.45			12.17	± 3.44		
Child race								
Non-Hispanic white			12,932	(71.0)			12,239	(70.0)
Hispanic			1,998	(11.0)			1,939	(11.1)
African American			1,102	(6.0)			1,032	(5.9)
Asian			954	(5.2)			972	(5.6)
Others			1,240	(6.8)			1,310	(7.5)
Child insurance								
Public only			3,232	(17.7)			3,085	(17.6)
Private only			13,368	(73.3)			12,837	(73.4)
Public and private			677	(3.7)			601	(3.4)
Uninsured			670	(3.7)			677	(3.9)
Female parent			12,043	(66.1)			11,547	(66.0)
Parent age	44.95	± 8.53			45.10	± 8.40		
Parent marital status								
Two parents, married			13,119	(72.0)			12,426	(71.0)
Two parents, not married			1,102	(6.0)			1,028	(5.9)
Single mother			2,331	(12.8)			2,427	(13.9)
Other family types			1,351	(7.4)			1,310	(7.5)
Parent who is US-born			15,507	(85.1)			14,874	(85.0)
Parent with college degree			10,829	(59.4)			10,415	(59.5)
Poverty level (DHHS)								
0 – 99%			1,814	(10.0)			1,679	(9.6)
100 – 199%			2,862	(15.7)			2,820	(16.1)
200 – 399%			5,535	(30.4)			5,311	(30.4)
400% or greater			8,015	(44.0)			7,682	(43.9)
Number of children	1.83	± 0.87			1.81	± 0.87		
ACEs (Range 0-9)	0.89	± 1.34			0.92	± 1.38		
1			4,229	(23.2)			3,958	(22.6)
2 or 3			2,820	(15.5)			2,733	(15.6)
4 or more			1,060	(5.8)			1,124	(6.4)
Parental aggravation (Range 0-1)	0.06	± 0.24			0.04	± 0.24		
Child internalizing problems (Range 0-2)	0.16	± 0.46			0.20	± 0.51		
Anxiety			1,999	(11.0)			2,228	(12.7)
Depression			936	(5.1)			1,198	(6.8)

Child externalizing problems (Range 0-2)	0.31	± 0.63			0.14	± 0.44		
ADHD			3,098	(13.7)			1,397	(8.0)
Behavioral/conduct problems			2,493	(13.7)			1,088	(6.2)
Child perseverance (Range 0-2)	1.56	± 0.57			1.69	± 0.51		
Child emotional regulation (Range 0-2)	1.42	± 0.62			1.48	± 0.59		
Personal support (Range 0-2)	1.34	± 0.81			1.34	± 0.81		
Spouse			11,510	(63.2)			10,917	(62.4)
Other family member/close friend			12,400	(68.0)			11,917	(68.1)
External resource (Range 0-6)	0.67	± 0.99			0.66	± 0.98		
Healthcare provider			3,613	(19.8)			3,230	(18.5)
Religion			4,260	(23.4)			4,140	(23.7)
Support/advocacy group			554	(3.0)			459	(2.6)
Peer support group			1,496	(8.2)			1,489	(8.5)
Mental health professional			1,587	(8.7)			1,550	(8.9)
Other			330	(1.8)			359	(2.1)

Note. Percentages may not add 100% due to missing cases; ACEs = Adverse childhood experiences; ADHD = Attention-deficit/hyperactivity disorder

Table 2. Correlations of used variables for males and females

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Child age (years)	-	-0.03**	0.03**	-0.04**	-0.04**	0.08**	0.01	-0.05**	-0.01	0.09**	-0.01	0.00	-0.17**
2 Child race	-0.01	-	0.03**	-0.11**	-0.11**	0.13**	0.02**	0.14**	0.12**	0.07**	0.07**	0.06**	0.06**
3 Female parent	0.04**	0.02*	-	0.06**	0.13**	-0.08**	-0.28**	0.15**	0.02*	0.03**	0.00	-0.03**	-0.01
4 Education level	-0.04**	-0.11**	0.06**	-	0.24**	-0.25**	0.00	0.12**	0.06**	-0.05**	-0.07**	-0.14**	-0.11**
5 Marital status	-0.02*	-0.15**	0.13**	0.22**	-	-0.46**	-0.05**	0.10**	-0.01	-0.09**	-0.13**	-0.13**	-0.10**
6 ACEs	0.08**	0.13**	-0.06**	-0.25**	-0.46**	-	0.16**	-0.05**	0.06**	0.24**	0.29**	0.23**	0.22**
7 Parental aggravation	0.03**	0.03**	0.00	-0.03**	-0.04**	0.15**	-	-0.07**	0.05**	0.31**	0.40**	0.32**	0.34**
8 Personal support	-0.04**	0.13**	0.15**	0.12**	0.09**	-0.05**	-0.05**	-	0.41**	0.00	-0.02*	-0.04**	-0.03**
9 External resource	-0.01	0.10**	0.03**	0.06**	0.00	0.06**	0.04**	0.41**	-	0.11**	0.11**	0.04**	0.06**
10 Internalizing problems	0.19**	0.07**	0.05**	-0.04**	-0.09**	0.25**	0.25**	0.00	0.16**	-	0.41**	0.26**	0.31**
11 Externalizing problems	0.03**	0.06**	0.01	-0.06**	-0.11**	0.24**	0.35**	-0.01	0.10**	0.38**	-	0.41**	0.44**
12 Perseverance	-0.03**	0.03**	-0.02*	-0.15**	-0.11**	0.23**	0.27**	-0.04**	0.02	0.25**	0.38**	-	0.52**
13 Emotional regulation	-0.08**	0.03**	-0.01	-0.12**	-0.08**	0.22**	0.27**	-0.01	0.05**	0.32**	0.36**	0.52**	-

*Note: C*hild race (white = 1, other = 0); female parent (female = 1, male = 0); education level (college degree = 1, less than college degree = 0); marital status (two parents = 1, single parent/other = 0); ACEs = adverse childhood experiences; *p < .05; **p < 0.01; coefficients in the upper right corner are for males.

Table 3. Hierarchical linear regression analysis (standardized coefficients) for variables predicting lifetime diagnoses of internalizing problems

	Model 1						Model 2						Model 3						Model 4					
	Male			Female			Male			Female			Male			Female			Male			Female		
Variable	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.
Child age (years)	0.09	0.00	***	0.19	0.00	***	0.08	0.00	***	0.16	0.00	***	0.08	0.00	***	0.17	0.00	***	0.08	0.00	***	0.17	0.00	***
Child race	0.03	0.01	***	0.05	0.01	***	0.04	0.01	***	0.05	0.01	***	0.05	0.01	***	0.06	0.01	***	0.05	0.01	***	0.06	0.01	***
Female parent	0.06	0.01	***	0.06	0.01	***	0.05	0.01	***	0.04	0.01	***	0.04	0.01	***	0.04	0.01	***	0.04	0.01	***	0.04	0.01	***
Education level	-0.02	0.01	*	-0.01	0.01		0.01	0.01		0.03	0.01	***	0.00	0.01		0.03	0.01	**	0.00	0.01		0.03	0.01	**
Marital status	-0.08	0.01	***	-0.09	0.01	***	0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01	
ACEs							0.19	0.00	***	0.22	0.00	***	0.19	0.00	***	0.22	0.00	***	0.20	0.00	***	0.23	0.00	***
Parental aggravation							0.28	0.01	***	0.21	0.02	***	0.27	0.01	***	0.21	0.02	***	0.28	0.02	***	0.21	0.02	***
PS													-0.03	0.01	**	-0.03	0.01	**	-0.06	0.02	***	-0.06	0.03	**
ER													0.10	0.01	***	0.09	0.01	***	0.19	0.02	***	0.21	0.02	***
ACEs x PS																			-0.03	0.01	**	-0.03	0.01	**
ACEs x ER																			0.03	0.01	***	0.04	0.01	***
PA x PS																			-0.04	0.04	*	-0.03	0.05	
PA x ER																			0.10	0.04	***	0.13	0.05	***
R^2			0.02			0.05			0.14			0.14			0.15			0.15			0.15			0.15
F for change in R^2			77.49***			176.46***			1186.66***			897.21***			79.38***			66.16***			13.57***			16.57***

Note: Child race (white = 1, other = 0); female parent (female = 1, male = 0); education level (college degree = 1, less than college degree = 0); marital status (two parents = 1, single parent/other = 0); ACEs = adverse childhood experiences; PS = personal support; ER = external resources; ^p <.10; *p < .05; **p < 0.01; *** p < 0.001; males: n = 17,177, females: n = 16,497.

Table 4. Hierarchical linear regression analysis (standardized coefficients) for variables predicting lifetime diagnoses of externalizing problems

	Model 1						Model 2						Model 3						Model 4					
	Male			Female			Male			Female			Male			Female			Male			Female		
Variable	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.
Child age (years)	0.01	0.00		0.03	0.00	***	-0.01	0.00		0.01	0.00		-0.01	0.00		0.01	0.00		-0.01	0.00		0.01	0.00	
Child race	0.02	0.01	**	0.02	0.01	*	0.04	0.01	***	0.02	0.01	*	0.04	0.01	***	0.02	0.01	**	0.04	0.01	***	0.02	0.01	**
Female parent	0.05	0.01	***	0.04	0.01	***	0.03	0.01	***	0.03	0.01	***	0.02	0.01	**	0.02	0.01	**	0.02	0.01	**	0.02	0.01	**
Education level	-0.03	0.01	***	-0.03	0.01	***	-0.01	0.01		0.00	0.01		-0.01	0.01	*	0.00	0.01		-0.02	0.01	*	-0.01	0.01	
Marital status	-0.12	0.01	***	-0.10	0.01	***	-0.02	0.01	*	-0.01	0.01		-0.02	0.01	*	-0.01	0.01		-0.02	0.01	*	-0.01	0.01	^
ACEs							0.20	0.00	***	0.18	0.00	***	0.19	0.00	***	0.18	0.00	***	0.21	0.01	***	0.20	0.00	***
Parental aggravation							0.35	0.02	***	0.33	0.02	***	0.34	0.02	***	0.33	0.02	***	0.34	0.02	***	0.33	0.02	***
PS													-0.03	0.01	***	-0.02	0.01	*	-0.04	0.03	*	-0.04	0.02	^
ER													0.10	0.01	***	0.08	0.01	***	0.11	0.02	***	0.17	0.02	***
ACEs x PS																			-0.03	0.01	**	-0.03	0.01	**
ACEs x ER																			0.03	0.01	***	0.06	0.01	***
PA x PS																			-0.02	0.05		-0.02	0.04	
PA x ER																			0.02	0.05		0.10	0.04	***
R^2			0.02			0.02			0.19			0.17			0.20			0.17			0.20			0.18
F for change in R^2			73.21***			57.03***			1779.93***			1481.06***			80.02***			48.49***			4.84**			20.42***

Note: Child race (white = 1, other = 0); female parent (female = 1, male = 0); education level (college degree = 1, less than college degree = 0); marital status (two parents = 1, single parent/other = 0); ACEs = adverse childhood experiences; PS = personal support; ER = external resources; ^p <.10; *p < .05; **p < 0.01; *** p < 0.001; males: n = 17,056, females: n = 16,458.

Table 5. Hierarchical linear regression analysis (standardized coefficients) for variables predicting perseverance

	Model 1						Model 2						Model 3						Model 4					
	Male			Female			Male			Female			Male			Female			Male			Female		
Variable	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.
Child age (years)	0.00	0.00		0.03	0.00	***	0.02	0.00	*	0.06	0.00	***	0.02	0.00	^	0.06	0.00	***	0.02	0.00	*	0.06	0.00	***
Child race	0.01	0.01	^	0.00	0.01		0.00	0.01		0.00	0.01		0.00	0.01		0.00	0.01		0.00	0.01		0.00	0.01	
Female parent	-0.04	0.01	***	0.00	0.01		-0.02	0.01	**	0.01	0.01		-0.02	0.01	**	0.01	0.01		-0.02	0.01	**	0.01	0.01	
Education level	0.11	0.01	***	0.14	0.01	***	0.10	0.01	***	0.11	0.01	***	0.10	0.01	***	0.11	0.01	***	0.10	0.01	***	0.11	0.01	***
Marital status	0.09	0.01	***	0.08	0.01	***	0.02	0.01	^	0.00	0.01		0.02	0.01	^	0.00	0.01		0.02	0.01	^	0.00	0.01	
ACEs							-0.15	0.00	***	-0.17	0.00	***	-0.15	0.00	***	-0.17	0.00	***	-0.15	0.00	***	-0.18	0.00	***
Parental aggravation							-0.25	0.02	***	-0.24	0.02	***	-0.29	0.02	***	-0.24	0.02	***	-0.30	0.02	***	-0.24	0.02	***
PS													0.01	0.01	^	0.01	0.01	^	0.03	0.02		0.02	0.03	
ER													-0.02	0.01	**	-0.01	0.01		-0.03	0.02	^	0.00	0.02	
ACEs x PS																			0.00	0.01		0.02	0.01	^
ACEs x ER																			0.00	0.01		0.00	0.01	
PA x PS																			0.02	0.05		0.01	0.05	
PA x ER																			-0.01	0.04		0.01	0.05	
R^2			0.03			0.03			0.14			0.12			0.15			0.12			0.15			0.12
F for change in R^2			105.03***			102.78***			1146.15***			851.53***			4.10*			1.54			0.24			1.66

Note: Child race (white = 1, other = 0); female parent (female = 1, male = 0); education level (college degree = 1, less than college degree = 0); marital status (two parents = 1, single parent/other = 0); ACEs = adverse childhood experiences; PS = personal support; ER = external resources; ^p <.10; *p < .05; **p < 0.01; *** p < 0.001; males: n = 17,062, females: n = 16,323.

Table 6. Hierarchical Linear Regression Analysis (Standardized Coefficients) for Variables Predicting Emotional Regulation

	Model 1						Model 2						Model 3						Model 4					
	Male			Female			Male			Female			Male			Female			Male			Female		
Variable	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.	β	SE B	Sig.
Child age (years)	0.18	0.00	***	0.08	0.00	***	0.19	0.00	***	0.11	0.00	***	0.19	0.00	***	0.11	0.00	***	0.19	0.00	***	0.11	0.00	***
Child race	-0.01	0.01		-0.03	0.01	**	-0.02	0.01	**	-0.03	0.01	***	-0.02	0.01	**	-0.03	0.01	***	-0.02	0.01	**	-0.03	0.01	**
Female parent	-0.04	0.01	***	0.00	0.01		-0.02	0.01	**	0.01	0.01	^	-0.02	0.01	*	0.02	0.01	*	-0.02	0.01	*	0.02	0.01	*
Education level	0.10	0.01	***	0.11	0.01	***	0.08	0.01	***	0.08	0.01	***	0.08	0.01	***	0.08	0.01	***	0.08	0.01	***	0.08	0.01	***
Marital status	0.08	0.01	***	0.06	0.01	***	0.00	0.01		-0.03	0.01	**	0.00	0.01		-0.03	0.01	**	0.00	0.01		-0.03	0.01	**
ACEs							-0.17	0.00	***	-0.19	0.00	***	-0.16	0.00	***	-0.18	0.00	***	-0.17	0.00	***	-0.20	0.00	***
Parental aggravation							-0.31	0.02	***	-0.25	0.02	***	-0.31	0.02	***	-0.25	0.02	***	-0.31	0.02	***	-0.24	0.03	***
PS													0.02	0.01	**	0.01	0.01		0.04	0.03	*	-0.01	0.03	
ER													-0.05	0.01	***	-0.04	0.01	***	-0.08	0.02	***	-0.01	0.03	
ACEs x PS																			0.02	0.01	^	0.02	0.01	*
ACEs x ER																			0.00	0.01		-0.01	0.01	
PA x PS																			0.02	0.05		-0.01	0.06	
PA x ER																			-0.03	0.05	^	0.03	0.06	
R^2		0.05			0.02			0.19			0.12			0.19			0.12			0.19			0.12	
F for change in R^2		184.68***			80.55***			1392.47***			912.57***			17.81***			11.67***			1.75			1.59	

Note: Child race (white = 1, other = 0); female parent (female = 1, male = 0); education level (college degree = 1, less than college degree = 0); marital status (two parents = 1, single parent/other = 0); ACEs = adverse childhood experiences; PS = personal support; ER = external resources; ^p <.10; *p < .05; **p < 0.01; *** p < 0.001; males: n = 17,389, females: n = 16,735.

Figure 1. The Prevalence of Adverse Childhood Experiences

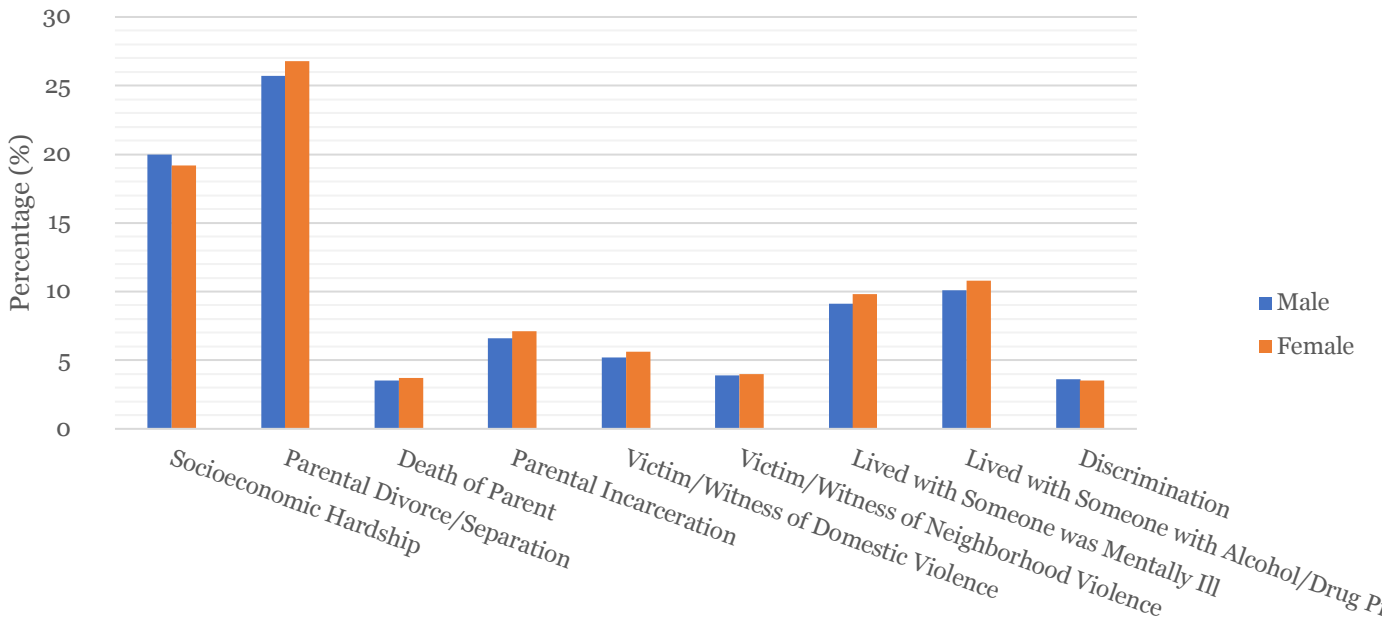


Figure 2. Line Graphs for Personal Support

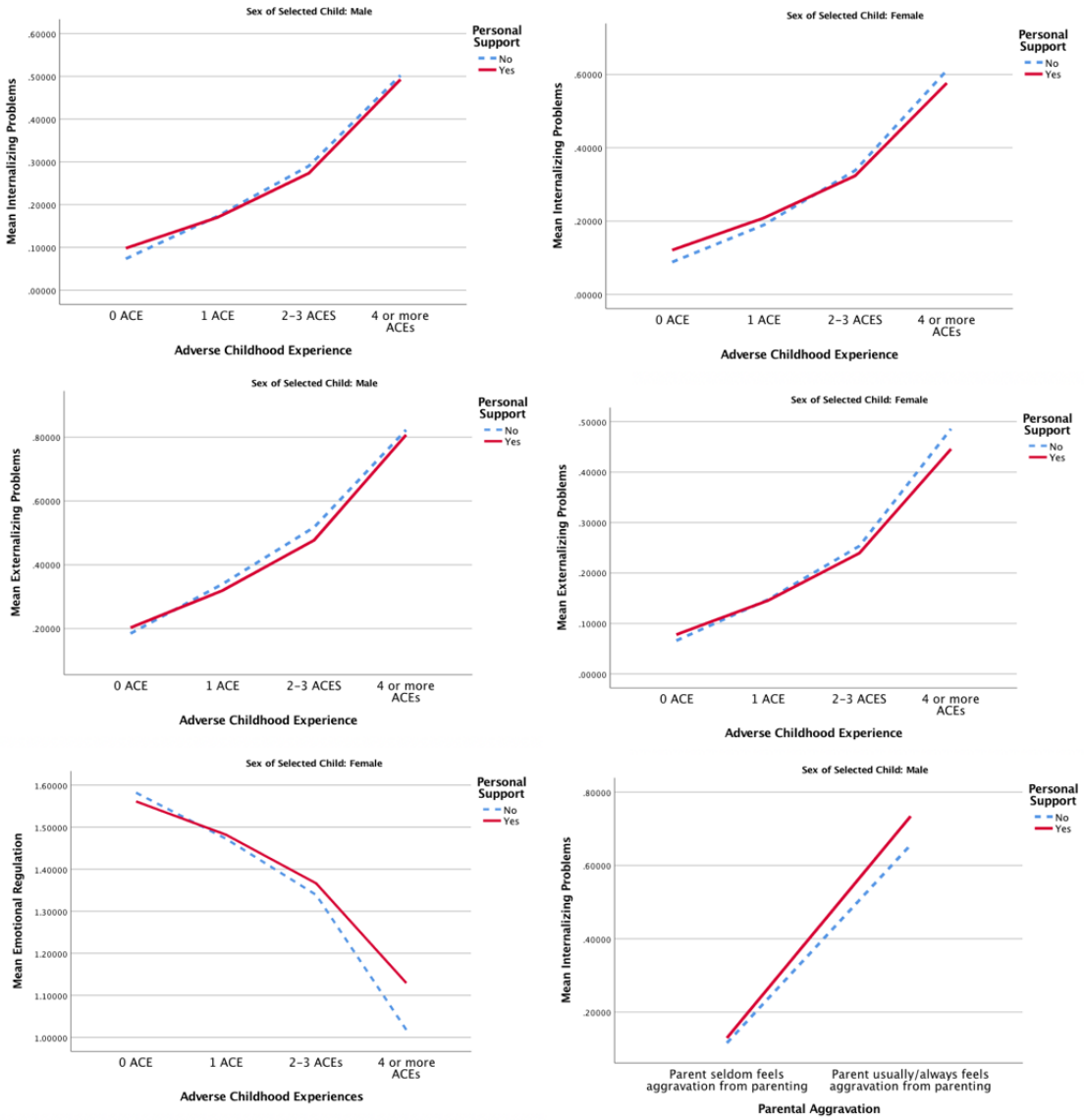
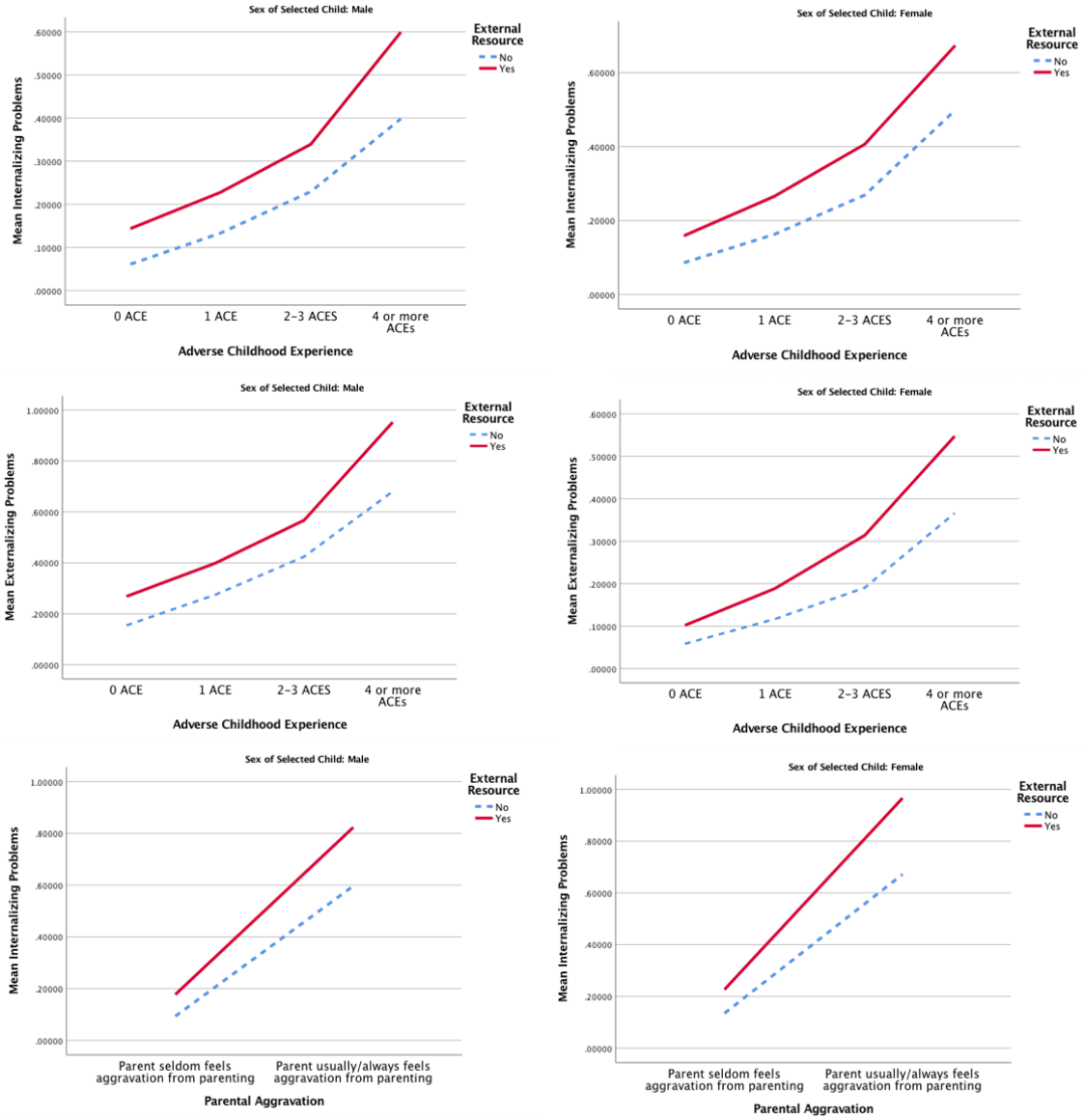


Figure 3. Line Graphs for External Resource



CHAPTER 3

THE IMPORTANCE OF HAVING CARING ADULTS IN THE DEVELOPMENT OF INTRINSIC ASPIRATIONS AMONG ADOLESCENTS IN HIGH ACHIEVING SCHOOLS

In today's western societies, where life success is highly valued, high achievement is considered an important indicator of self-concept, competence, and life satisfaction. However, a recent review of literature noted that personal achievement does not necessarily reflect one's high subjective well-being (Bücker et al., 2018). Despite the fact that educational attainment and monetary resources have never been higher, there are escalating rates of mental issues during adolescence in developed countries—such as suicide, depression, and anxiety (Kwak & Ickovics, 2019; Twenge et al., 2018).

While investigating reasons for the well-being of adolescents, the issue of 'pressure to achieve' among adolescents in high-achieving communities has gained attention in research, practice, and policy. In 2018, a report on adolescent wellness noted that the top four environmental risk factors were, in order: exposure to poverty, trauma, discrimination, and excessive pressure to achieve (Nakashian & Geisz, 2018). A year later, a comprehensive report by the National Academies of Science, Engineering & Medicine (NASEM, 2019) included students in high achieving schools (HASs) among subgroups of youth who are especially vulnerable; others listed included children in poverty, those in the foster care system, and those with incarcerated parents. Students in HASs showed greater levels of serious adjustment problems when compared to nationally normative samples (Luthar & Latendresse, 2005). The aforementioned national policy reports and research indicated that students at HASs are an at-risk group.

The high pressure to achieve comes from multiple sources in these children's environments (Luthar et al., 2019). Parents want their children to have the very best

educational opportunities possible, seeing attendance at selective universities as essential for their children's future financial well-being. Teachers, coaches, and school administrators all invest in establishing their own school's distinctiveness compared with others like them; the schools strive for distinctiveness in terms of the high standardized test scores, successful sports championships, and the university/college options (Luthar et al., 2019). Peers attending school are in constant competition; one student's success implies other students are falling behind in academic or extracurricular arenas. A major concern is that high emphases on success—which is perceived to become famous and have financial means—and materialism in today's society can encourage the students to pursue *extrinsic values*; this can discourage opportunities to explore *intrinsic values* that are essential for academic achievement, well-being, and life satisfaction.

Adolescence as the Developmentally Important Stage

In human development, adolescence is a meaningful period of time as it is the 'window' for opportunities to grow; yet, it has not gained much attention in research (Luthar & Eisenberg, 2017). O'Connor et al. (2017) stated that mental health during adolescence predicts success of various domains, such as career development, romantic relationships, and responsibilities of citizenships later in life.

Adolescence is characterized by increasing autonomy, physical/mental maturity, and adaptation of prosocial behaviors with a growing ability to understand others' emotions (Keulers et al., 2010). Importantly, materialism at this stage of development is known to decrease prosocial behaviors toward peers and strangers (Yang et al., 2018). Instead, past research has shown that the rates of rule-breaking spike in adolescents partly due to the influence of environmental conditions (e.g., peer interactions, parenting) that exacerbate antisocial behaviors (Niv et al., 2013). In highly competitive

settings, teens especially conform with peer deviance, such as substance use, in the effort to maintain peer relationships and reputation (Curlee et al., 2019).

In studying youth at risk, it is important to identify factors that impair or promote positive adjustment at their developmental stages, particularly those that are 'most influential and relatively modifiable' (Luthar et al., 2015). Past research examined parental and peer influence on maladjustment in HAS youth; however, little is known about how different dimensions of school climate might potentially foster positive adjustment. In this study, our central focus is high investment in intrinsic values after accounting for parent and peer influences.

Salience of Intrinsic Values in High Achieving Adolescents

According to the Self-Determination Theory (Ryan & Deci, 2000), human behaviors are motivated by intrinsic or extrinsic motivations, or both. Intrinsic motivation is defined as "the doing of an activity for its inherent satisfaction rather than for some separable consequence" (p. 55). On the other hand, sources of motivation can be derived extrinsically which refers to "a construct that pertains whenever an activity is done in order to attain some separable outcome" (p. 55). Regarding a given task, the extent to which an individual perceives the task to resonate with his/her own values determines the interest and autonomy in performing the task.

Although some aspects of extrinsic motivation may share similarities with intrinsic motivations, the main difference is that the latter is stemmed from enjoyment, yielding separable adjustment outcomes. Ryan and Deci further stated, "Perhaps no single phenomenon reflects the positive potential of human nature as much as intrinsic motivation, the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (p. 70). Gottfried et al.'s longitudinal study (2017) showed that high academic intrinsic motivation resulted in high intrinsic

motivation related to cognitive performance (e.g., enjoying coming up with new solutions to challenges) in adulthood, regardless of one's intellectual ability. In the same study, those who started with low academic intrinsic motivation showed decreased enjoyment in learning throughout secondary school years. This is because intrinsically driven aspirations have associations with subjective well-being, meaning in life, and better academic achievement (Bailey & Phillips, 2015). Additionally, in sports, those whose goals were performance-oriented, not intrinsically oriented, were likely to exhibit inappropriately aggressive behaviors toward their opponents (Ozdemir Oz et al., 2016).

Factors Associated with Intrinsic Values

Noteworthy is that stressful environments impair the intrinsic desire to care about the well-being of others. To illustrate, aspirations based on intrinsic orientation are shaped by one's experiences of competence, autonomy, and relatedness with others (Ryan & Deci, 2017). Competence develops in a context where individuals face optimal challenges and helpful feedback which is free from threats and pressured evaluations. As for autonomy and relatedness, it is important for one to have the volition to carry out a behavior. In addition, individuals should be able to perceive the work as important to themselves. In a focus group study, with teenagers, acts of kindness to others and the desire to make oneself happy are seen to be interwoven such that both directions in the relationship are possible (Cortney & Banergee, 2019). However, it is unlikely that one would care about the well-being of others if the person is consumed by his or her own unhappiness. This is supported by evidence showing that unhappy people are less likely to exhibit philanthropic or altruistic behaviors (e.g., Ali & Bozorgi, 2015).

Furthermore, abilities for self-reflection have associations with the development of intrinsic aspirations toward interpersonal relationships, such as cooperation and empathetic understanding (Kim et al., 2011). This also applies to intrinsic aspirations

toward self-development, as introspection is a major feature of investment in personal growth (Kim et al., 2011). On the other hand, intrinsic values run counter to externalizing behaviors which conceptually makes sense because delinquency and rule-breaking by definition implies lack of concern for the welfare for others (Niv et al., 2013). This is what exists at the core of intrinsic aspirations examined in this study, i.e., investment in relationships and community.

Aspects of School Climate Cultivating Intrinsic Motivation in High Achieving Contexts

As described earlier, in schools where students are commonly overextended, time pressures—given demanding course loads and overscheduled time on extracurriculars—might interfere with prosocial goals (Luthar et al., 2019). In high achieving contexts, the race to attain the highest of high-status positions invariably implies attenuated concern for others in one's work environments. According to Luthar (2003), moving up the ladder in corporate jobs can be difficult to achieve if individuals are trying to invest in others' welfare; in other words, people may perceive the need to be callous in order to 'climb over others' to get to the top ladder. 'Doing something on behalf of others' often means to sacrifice one's temporary comfort and enjoyment for those who are in need. Highly stressful environments can hinder the adaptation of prosocial behavior, especially for those who are constantly under pressure, and thus biologically and psychologically in a survival mode. Limited availability of parents due to their professional careers can also lead to lack of family time; in turn, inadequate time for investment in relationships with parents and peers can jeopardize adjustments of the adolescents (Luthar & Barkin, 2012; Luthar & Latendresses, 2005).

Positive tendencies of social development are motivated by meaningful relationships with others, intrinsic values for personal growth, and betterment of society

as a whole. Thus, it is plausible that when students perceive adults at their schools as manifesting prosocial goals by prioritizing the welfare of others, they are likely to adopt such behaviors. A critical potential factor here, for example, is perceptions that there are adults at school who show genuine concerns for students in their behaviors. When children feel that adults on campus voluntarily provide compassion and kindness to students in trouble, these adults could serve an important role in whether students feel welcomed and cared for at school (Uslu & Gizir, 2017). Also considered are perceptions of respect for diversity at school; when teachers and administrators are seen as respecting students of different ethnic backgrounds, this could enhance equity and prosocial attitudes among the students themselves (Minkos et al., 2017).

Summary

Youth in high-achieving schools (HASs) are an at-risk group with a major posited cause as pressure to outdo peers in achievements (Geisz & Nakashian, 2018; NASEM, 2019). Prior studies in HASs revealed high levels of psychological stress due to the competition to get accepted to stellar universities after graduating high school. Of interest, therefore, is what allows some of them to retain investment in the welfare of communities and relationships, within their highly competitive settings. In view of the evidence presented, influence of peers and parents on positive adjustments in youth are already well-known in the literature. After accounting for the peer and parent dimensions, the central goal is to examine how different dimensions of school climate might potentially foster high investment in intrinsic values. Therefore, the following research questions were asked in this study: 1) To what extent would school climate (i.e., caring adults and diversity at school) contribute to intrinsic aspirations (AIR) with regard to community, relationships, and personal growth, within high school students at HASs?; 2) To what extent would the AIR constructs be associated with one another?

Importantly, we sought to replicate this across multiple HASs as these questions are addressed here across four HAS samples, two boarding, and two-day schools. This is the method to statistically explore social phenomena that have not been studied in the past literature (Maner, 2014). By doing so, it becomes possible to look for commonly emerging patterns of results across multiple groups of participants sharing similar contextual problems.

Methods

Participants and Settings

The data were collected from four high-achieving high schools in the United States. A total of 3,167 students from Grade 9 to Grade 12 participated in the survey administered in 2017 (n = 638 in School A) and 2018 (n = 624 in School B; n = 724 in School C; and n = 1,181 in School D). Researchers aimed to collect data from proportional numbers of cases from all grades. As a result, data were derived from 17.7-29.3% in each grade. Across all four schools, 48.2-51.7% of the participants identified themselves as male; a vast majority of them (77.7-84.7%) had two, married parents who were highly educated. Participants reported that fathers had graduate degrees (47.3-61.2%) and college degrees (28.6-42.3%). Such proportions were similar in mothers as 43.0-48.6% of mothers had graduate degrees and 40.2-48.9% had college degrees. Most fathers (80.8-88.3%) worked full time, although the proportions of mothers working full time were smaller (23.5-57.2%). Median household incomes in the areas where the four schools are located were $58,992 for School A, $87,336 for School B, $48,409 for School C, and $91,183 for School D in 2018, according to the United States Department of Agriculture (2020).

Among those who participated in the survey, 2,579 (81.4%) completed all items used for the main analyses for this study. Those who completed the survey had higher

scores on AIR-Community, Relationships, and Personal Growth than those who did not [$F(1, 2{,}925) = 9.81$, $p < 0.001$; $F(1, 2{,}928) = 21.691$, $p < 0.001$; and $F(1, 2{,}929) = 13.86$, $p < 0.001$, respectively].

Measures

Maladjustment Problems

To measure withdrawn/depressed and rule-breaking problems, the relevant subscales from the Youth Self Report (YSR; Achenbach & Rescorla, 2001) were used. The subscale for withdrawn/depressed symptoms had 8 items asking, in the past 6 months, how often, for example, participants felt there was very little that they enjoyed and when they preferred being alone. There were 13 items related to rule-breaking regarding how frequently in the past 6 months participants broke the rules at both school and home, told lies to get what they want, and stole others' belongings. Reponses for all items were rated on a 5-likert scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, 4 = *very often*). Cronbach's αs across all 8 subgroups (2 gender x 4 schools) ranged from 0.81 to 0.88, median 0.83, for withdrawn/depressed symptoms, and from 0.77 to 0.90, median 0.85, for the rule-breaking problems.

Intrinsic Aspirations (AIR)

The survey included 30 items (Kasser & Ryan, 1996) asking about the importance of long-term goals or aspirations such that participants hoped to accomplish over the course of their lives. The study used 3 subscales regarding *community* (5 items; e.g., "to work for the betterment of society," and "to help others improve their lives"), *relationships* (5 items; e.g., "to share my life with someone I love," "to feel that there are people who really love me, and whom I love"), *personal growth* (5 items; e.g., "to grow and learn new things, relationships, and personal growth," and "to gain increasing insight into why I do the things I do"). Responses to each question were ranged from 1

(*not at all important*) to 7 (*very important*). Cronbach's *α*s ranged from 0.88 to 0.92, median 0.91, for AIR-Community, from 0.84 to 0.90, median 0.88, for AIR-Relationships, and from 0.69 to 0.84, median 0.77, for AIR-Personal growth, across all schools and gender.

Time Pressure

Time pressure was measured by 5 items regarding the degree to which participants felt time pressure from academic responsibilities, such as homework and exams. Responses were rated on a 5-likert scale (1 = *not at all*, 2 = *slightly*, 3 = *somewhat*, 4 = *moderately*, 5 = *a great deal*). Average scores of all 5 items were used for the main analyses. A total of 8 Cronbach's *α*s for this measure across all subgroups ranged from 0.89 to 0.94, median 0.94.

Peer Victimization

Peer victimization was assessed by 13 items regarding how often participants felt another student directed victimizing behaviors toward them, such as leaving participants out of an activity or conversation, grabbing/holding/touching in an inappropriate way, hit/kicked/pushed in a mean way, spreading a rumor, and using negative body language or facial expressions. Responses were rated on a 5-likert scale (1 = *never*, 2 = *once or twice*, 3 = *a few times*, 4 = *about once a week*, and 5 = *a few times a week*). Average scores of all 13 items were used for the analyses. Cronbach's *α*s of the measure across all subgroups ranged from 0.84 to 0.95, median 0.90.

Caring Adults at the School

The presence of caring adults at the school was assessed by 8 items asking the extent to which students agreed that there was at least one caring adult whom students could comfortably share 'things that bother them' talk one-on-one, as well as who would always listen and really care about them. Participants rated their response to each

question on a 5-likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *disagree some/agree some*, 4 = *agree*, and 5 = *strongly agree*). Cronbach's *α*s across all schools and gender ranged from 0.84 to 0.90, median 0.85.

School Diversity

School diversity was measured by 4 items asking 1) if teachers "use examples of students' different cultures/backgrounds/families in their lessons to make learning more meaningful," 2) if students "see people of many races, ethnicities, cultures, and backgrounds represented in the curriculum," 3) if teachers "call on students of different races, ethnicities, cultures, and backgrounds," and 4) if students "feel that teachers respect students' culture/background." Participants responded to each question on a 5-likert (1= *very rarely*, 2 = *rarely*, 3 = *some of the time*, 4 = *most of the time*, and 5 = *all the time*). Cronbach's *α*s across all schools and gender ranged from 0.65 to 0.84, median 0.85.

Parent Attachment

The revised version of Inventory of Parent and Peer Attachment (IPPA; Greenberg & Armsden, 2009) was used to measure adolescents' perceived attachment with their parents/caregivers. The revised version included 50 items regarding the levels of *trust* (e.g., "My mother/father respects my feelings"), *communication* (e.g., "I tell my mother/father about my problems and troubles"), and *closeness* (e.g., Reverse coded: "I get upset a lot more than my mother knows about me"). Cronbach's *α*s ranged from 0.93 to 0.96, median 0.95, for the 25 items regarding attachment with mother, and from 0.94 to 0.96, median 0.95, for the 25 items regarding attachment with fathers. Due to the high correlation between the two attachment variables, we used the maximum value in the analyses.

Statistical Analyses

To examine the effect of school climate (i.e., the presence of caring adult and diversity within school) on students' intrinsic aspirations regarding community, relationships, and personal growth, we conducted hierarchical regression analyses, separately by school and gender. Step one of each model included adjustment problems (i.e., withdrawn/depressed and rule-breaking problems), time pressure, peer victimization, caring adult at school, school diversity, attachment with parent(s); Step two included the rest of the two AIR constructs (e.g., for model predicting to AIR-Community, Step two had AIR-Relationships and AIR-Personal Growth).

Results

Descriptive Statistics

Table 1 shows descriptive statistics for the variables. The results of Analysis of Variance (ANOVA) revealed group differences for gender and schools. Withdrawn/depressed symptoms were higher in girls than boys [$F(1, 2{,}864) = 12.61$, $p < 0.001$] while it was opposite for rule-breaking [$F(1, 2{,}869) = 47.08$, $p < 0.001$]. Girls felt more time pressure due to academic responsibilities [$F(1, 2{,}935) = 194.09$, $p < 0.001$) and higher school diversity than boys [$F(1, 2{,}824) = 7.28$, $p < 0.01$].

A number of group differences by schools were found, as well: for Rule-breaking, School B > School D > School A > School C [$F(3, 2{,}874) = 3.85$, $p < 0.01$]; for time pressure due to academic responsibilities, School D > School C > School B > School A [$F(3, 2{,}941) = 11.62$, $p < 0.001$]; for peer victimization, School B > School D > School C > School A [$F(3, 2{,}767) = 8.15$, $p < 0.001$]; for caring adults at school and school diversity, School C > School A > School B > School D [$F(3, 2{,}935) = 86.657$, $p < 0.001$; $F(3, 2{,}829) = 50.73$, $p < 0.001$, respectively]; for AIR-Community, School C > School B > School D > School A [$F(3, 2{,}923) = 8.80$, $p < 0.001$]; for AIR-Relationships, School B > School C >

School A > School D [$F(3, 2{,}926) = 21.01$, $p < 0.001$]; and, for AIR-Personal Growth, School C > School B > School A > School D [$F(3, 2{,}927) = 25.31$, $p < 0.001$].

Bar graphs in Figure 2 represent the percentages of students who reported to confide with each of the resources at their schools (e.g., religious leader, nurse, dean, athletic coach). Each school showed distinct results: in Greenfield, both boys and girls identified religious leader and nurse as 'adult at school' to talk to, when facing difficulties. However, boys in School A reported that they were more likely to discuss with dorm head and advisor, while girls at the same school chose advisor and school counselor. In School C, college counselor and dean were the most frequently reported as the resources among boys, and athletic coach and college counselor for girls. Finally, boys and girls in School D reported athletic coach and religious leader as the top two resources.

Correlations

Appendix A shows correlation coefficients for variables used for the analyses, separately by school and gender. Withdrawn/depressed symptoms had significant, moderate correlations with rule-breaking in all 8 subgroups, $0.37 < r\text{s} < 0.68$. Time pressure was also correlated with withdrawn/depressed and rule-breaking problems, albeit not consistent across the subgroups. Peer victimization was moderately correlated with withdrawn/depressed and rule-breaking problems across all subgroups, $0.28 < r\text{s} < 0.60$. Caring adult at school had negative correlations with withdrawn/depressed symptoms, $-0.37 < r\text{s} < -0.16$, and also with rule-breaking, $-0.36 < r\text{s} < -0.16$ among all subgroups, except for boys in School C. School diversity had negative correlations with the adjustment problems, mostly among girls in all schools and boys in School D. Overall, AIR-Community, Relationships, and Personal Growth had negative associations

with withdrawn/depressed symptoms and rule-breaking, although such associations were inconsistent across the subgroups.

A number of moderate to high correlations were found among all three AIR subscales. AIR-Relationship had significant associations with AIR-Community, $0.30 < r\text{s} < 0.63$. AIR-Personal Growth was significantly associated with AIR-Community, $0.53 < r\text{s} < 0.73$, and AIR-Relationship, $0.31 < r\text{s} < 0.77$. To examine possible multicollinearity problems for regression analyses which will be discussed next, Variance Inflation Factor (VIF) were examined for possible collinearity issues; all variables were below the cutoff point (i.e., 10; Midi & Bagheri, 2010).

Regression Analyses

Models Predicting to AIR-Community

Table 2 shows standardized coefficients (βs) of the hierarchical regression model predicting to AIR-Community, separately by school and gender. The most common, and pronounced relationship was found between caring adults in school and AIR-Community across all 8 subgroups ($0.11 < \beta\text{s} < 0.25$). The second most common relation found in the results were the links between time pressure and AIR-Community—which was present among 5 out of 8 subgroups ($0.15 < \beta\text{s} < 0.23$). Rule-breaking had a negative association with AIR-Community among boys and girls in School A (βs = -0.16 and -0.16, respectively). Also, attachment with parents had a positive association with the dependent variable among boys in School B and School C (βs = 0.14 and 0.22, respectively). Peer victimization and school diversity were associated with AIR-Community only among boys in School A (β = 0.15), and girls in School C (β = 0.12), respectively. Last, withdrawn/depressed problems had no notable relationship with AIR-Community, but a marginally significant link among boys in School A. Seven variables in

Step 1 of the hierarchical regression model accounted for 9-17% of the variance explained.

In Step 2 of the model, adding two other AIR variables revealed that AIR-Personal growth had a positive association with AIR-Community among all subgroups ($0.41 < \beta s < 0.60$). Also, AIR-Relationships and AIR-Community had a positive link among five subgroups ($0.12 < \beta s < 0.30$). The other AIR constructs in Step 2 explained 24-55% more variances. Together, nine variables in the final step of the regression model explained 35-50% of the total variance.

Models Predicting to AIR-Relationship

Table 3 represents the standardized coefficients (βs) of the model predicting to AIR-Relationships. Time pressure had the most common link with AIR-Relationships which was found to be significant among five out of eight subgroups ($0.20 < \beta s < 0.28$), except for girls in School A and School C. School diversity was positively correlated with the dependent variable among boys in School D ($\beta = 0.20$), and girls in School C and School D (βs = 0.22 and 0.12, respectively). Caring adult at school had a positive association with AIR-Relationship among boys in School B ($\beta = 0.20$) and girls in School C ($\beta = 0.23$). Withdrawn/depressed problems were negatively associated with AIR-Relationship among boys and girls in School A (βs = -0.17 and -0.29, respectively). The link associated with attachment with parents was significant among boys in School C with a relatively high coefficient ($\beta = 0.35$), and girls in School D ($\beta = 0.13$). There was no significant association of AIR-relationship with rule-breaking and peer victimization. Together, seven variables in Step 1 of the model explained 6.9-14.4% of the variance.

Step 2 of the model included AIR-Community and Personal Growth. Results revealed that AIR-Personal Growth was highly positively correlated with the dependent variable in all eight subgroups with large magnitudes of β coefficients ($0.20 < \beta s < 0.64$).

AIR-Community had a positive association with AIR-Relationship among five out of the eight subgroups (0.11 < βs < 0.23). Variables in Step 2 explained 11-51% more variance. A total of nine variables explained 25-60% of the total variance.

Models Predicting to AIR-Personal Growth

The regression results (βs) for the model predicting to AIR-Personal Growth are shown in Table 4. Caring adult at school was most commonly associated with AIR-Personal Growth—which was significant in six out of eight subgroups (0.12 < βs < 0.24), except for boys in School C and School D. Time pressure was associated with the dependent variable in five out of eight subgroups (0.16 < βs < 0.25), except for boys in School C, and girls in School A and School C. School diversity had a positive relation with the dependent variable among Boys in School D (β = 0.18) and girls in School C and School D (βs = 0.20 and 0.15, respectively). Peer victimization had a negative association with AIR-Personal Growth among boys in School C (β = -0.14) and girls in School B (β = -0.16). Significant links between attachment with parents and AIR-Personal Growth were found in the half of the subgroups (0.14 < βs < 0.23). Withdrawn/depressed and rule-breaking problems did not have significant associations with the dependent variable in all of the subgroups. In Step 1, seven variables explained 9-16% of the variance.

In Step 2, there were a number of significant links associated with AIR-Community and Relationships with large magnitudes of β coefficients, across all subgroups. The β coefficients for AIR-Community ranged from 0.29 to 0.52, and for AIR-Relationships ranged from 0.16 to 0.56. Variables in Step 2 explained 42-58% more variance—which together accounted for 38-69% of the total variance.

Supplementary Analyses

Because intrinsic aspirations—i.e., AIR variables—were our primary interests, we conducted supplementary analyses to ensure the unique effects of AIR variables stay the

same, even after adding an additional variable in each model. The models in the supplementary analyses included 'confiding with adults inside/outside of school' which asked participants if they have confided with adults inside/outside of school when facing hardships, and if they would be willing to do so. The results did not differ from the main analyses explained previously.

Discussion

In this study, the area of interest was what allows some of the adolescents to retain investment in the welfare of communities and relationships, within their highly competitive settings. Our findings showed that having a caring adult at school played a significant role in AIR-Community and Personal Growth while such association was less common with AIR-Relationships. Also, the contributing effect of Time Pressure was the second most pronounced indicators of intrinsic aspirations, more so with AIR-Relationships. The overall results imply that caring adults facilitate adjustment of the youth as a protective factor, by promoting multiple aspects of intrinsic aspirations in the high achieving context.

The Presence of Caring Adults at School as a Protective Factor

The salutary effects of having caring adults at school found were in line with past studies with foster care youth (Neal, 2017), students in high-achieving, low-income communities (Williams et al., 2016), and a large pool (N = 9,041) of middle school students in the United States (Woolley & Bowen, 2007). These findings reflect the underlying assumptions of the Self-Determination Theory as to how developmental propensities and social environments strengthen development of intrinsic aspirations (Ryan & Deci, 2017). Supportive relationships with adults serve as social capital for adolescents and precipitate the sense of belonging (Woolley & Bowen, 2007).

The link between caring adults and AIR subscales can also be bidirectional because caring often occurs with mutual exchange of respect among carers (e.g., teachers, advisors) and carees (i.e., students). As described by Pettersen (2012), 'mature caring' precipitates compassion and cooperation among members, with the shared interest of others' well-being. One of the students in a qualitative study conducted by William et al. (2016) described his/her experience with a caring teacher as "If I need help, they're there during lunch, after school, or before school. I try to make them proud by being cooperative, following the rules, paying attention, earning good grades and staying out of trouble" (p. 190).

Another possible explanation is that students may adapt positive behaviors of school personnel by observations and role-modeling. Teachers' roles, for example, involve helping students academically and personally through regular mentorship as role models. In this past study, students identified accountability and role model, as the core characteristics of caring relationships (Laursen & Birmingham, 2003). Laursen and Birmingham emphasized that this goes beyond having a "feel-good" relationship, and that it necessitates the display of beliefs and acts of caring.

Though it is true that teachers play significant roles in students' adjustment, our descriptive data suggest a range of supportive roles, spanning from advisors to school administrators, endorsed by the students. Also, the proportions of school personnel, with whom students confided, varied by school and gender in this study—for example, students at School B reported that advisors and dorm heads were the ones that provided the most care, whereas school counselors and religious leaders were the most frequently endorsed in School C. More importantly, regardless of types of personnel, there were moderate effect sizes of caring adults in the regression models predicting to AIR subscales, across all four schools and gender. This indicates that supportive

interpersonal relationships can be established in many forms *ad hoc*, not necessarily through teacher-student relations as the only way to do so. In other words, who forms a meaningful relation with students may not matter as much, but whether the students feel supported or not does.

Finally, of note, there were relatively fewer significant effects of caring adults in the regression models with AIR-Relationships. It is possible that, unlike aspirations for community and personal growth, prosocial behaviors toward close others are also predicted by other variables that are not exclusively measured in this study, such as sympathy, perspective taking, and maternal warmth (Padilla-Walker et al., 2017). Also, when considering prosocial behaviors in interpersonal relationships, it is important to consider toward whom the prosocial behavior is directed. The mechanisms through which prosocial behaviors occur, are different depending on who the target is (e.g., a family member vs. a close friend; Padilla-Walker et al., 2017). More research is needed to elaborate on the target of prosocial behaviors and other possible factors contributing to prosociality in diverse relationships.

Implications of the Association Between Time Pressure and Intrinsic Aspirations

Interestingly, our study found a number of links between Time Pressure and AIR subscales—more so with AIR-Relationships. This does not necessarily mean that time pressure antecedes aspirations for relationships. Rather, individuals tend to conform with the norms and exhibit a bias about self when there is a time constrain. A study with a large sample of randomly selected adult participants in the United States elaborated that those who responded quickly to questions about prosociality were more likely to choose socially desirable answers (Protzko et al., 2019). Protzko et al. explained that socially favorable behaviors are 'default' responses that are learnt throughout a course of

past social interactions, indicating that in general, individuals believe themselves as virtuous. In this study, however, it is unlikely that participants did not have enough time to respond to each question; perhaps, more likely is that the students' mindset to accomplish a 'to-do list' in a timely manner—especially under the pressure to outdo others—may be reflected in our results as the notable association between time pressure due to academic work and intrinsic aspirations.

Another speculation is that the adolescents who have reported time pressure are likely to be busy with resume building activities including volunteering, religious activities, and student organizations. Padilla-Walker and colleagues (2017) stated that prosocial behaviors can increase during adolescence when there are more volunteer opportunities provided for them, as well as time to develop meaningful interpersonal relationships with peers. Intrinsic aspirations, therefore, could develop via participation of the philanthropic work. Although this study did not further investigate what extracurricular activities people participated in the most, future research can produce a deeper understanding on how extracurricular activities can contribute to motivations for the betterment of self, others, and communities.

Links among Intrinsic Aspirations

This study found a number of notable associations among AIR-subscales, which means, students who reported higher intrinsic aspirations for community were also likely to pursue higher aspirations for interpersonal relationships and personal growth. In other words, those who have good morals and desire to make a better community, are likely to invest in interpersonal relationships and self-improvement. This could be because moral identity and perceived efficacy to help others drive a broad range of prosocial behaviors, as supported by Patrick et al.'s study (2018) with adolescents. Moral identity consists of two dimensions: internalization (which concerns the degree to which

moral traits are central to self-concept) and symbolization (which concerns the degree to which the moral self is presented to others; Aquino & Reed, 2002). The two constructs interact with each other such that by performing caring actions, individuals also internalize their behaviors, enhance the sense of morality, and thus desire to maintain their moral self (Gotowiet & van Mastrigt, 2019). In HASs samples, this may have also promoted various aspects of intrinsic aspirations as shown in significant associations among the AIR subscales. However, more research is needed to understand what causes those aspects of intrinsic aspirations to be interwoven, and how the aspirations are projected in actual behaviors.

Effects of Other Variables on Intrinsic Aspirations

Prior research in HASs identified that times with their parents and friends to build secure relationships are essential for interpersonal skill development (Luthar et al., 2019). Of them, parents indeed have a substantial influence on promoting prosociality of their adolescent children as parents' intrinsic values are transmitted to their offspring (Lekes et al., 2011). Our data was consistent with the prior research, albeit not consistent in all regression models predicting to AIR subscales. There were a number of significant associations found between parent attachment AIR-Personal Growth while these links were less common with the other two AIR subscales, after accounting for mental health status and school climate indicators.

Speculating the reasons, a notable association between parent attachment and AIR-Personal Growth could be because parents are the ones who motivate their children to invest in personal success. On the other hand, intrinsic motivations for the betterment of community and society as a whole are, in general, motivated by interpersonal relationships outside one's home. Considering that adolescents spend a majority of time at school and in a community, it is possible that parental attachment may have less

impact than other independent variables in the models predicting to AIR-Community and Relationships.

Last, the degree of diversity at school alone did not fully predict variations of intrinsic aspirations as shown by the sporadic associations with AIR subscales. This was incongruent with the past research that showed the moderating effect of school diversity on the relation between racial identity and intrinsic motivations among African American students (Byrd & Chavous, 2011). Unlike the past study whose participants were mostly African American, most of whom identified themselves as multiracial, the majority of our participants were white/Caucasian. The four schools that were included in this study did not have a diverse student body.

Implications for Practice in School Settings

The study findings provide several implications for practice. First, the study results indicate the need for more school-based interventions that emphasize interpersonal connectedness and quality relationships, such as mentoring programs (Bayer et al., 2015). In such programs, adolescents are connected to volunteer adults via regular meetings where they can seek guidance and adult support. Another similar example is Big Brothers Big Sisters of America (2020) which is a program designed to form 'friendship' with qualified volunteers. At the same time, staff who are working with students at school should ensure that the students' psychosocial needs are met in their learning environment.

Second, school leaders should ensure adequate leadership and administrative support for teachers' wellbeing (Ford et al., 2019). Just like ongoing pressure to compete with peers to move up the ladder is stressful for students, teachers are likely to be overwhelmed with high demands for administrative and teaching duties, as well as student mentoring. Deficiency of support at the organizational or state level is linked

with high teacher burnout and turnover (Ford et al., 2019). Also, it is impossible to meet the needs of all students, especially when there are a number of carees demanding help. Schools should encourage carers—which, in this case, includes teachers, advisors, nurses, etc—to allocate care by judging the situation and retain balance in relationships with the students (Pettersen, 2012).

Limitations and Strengths

Our study had several limitations. First, the study was based on the cross-sectional design which did not fully capture the causal relationships between school dimensions and dependent variables. Building on the empirical work of this study, future studies with a longitudinal design can investigate the causality of caring relationships and various adjustment outcomes. Second, a majority of participants across four schools were white/Caucasian with two, married parents. There could be generalizability issues, when applying the findings to students from diverse ethnic/racial backgrounds and dysfunctional families. Third, the entire data used for the analyses were based on students' self-report. Future studies may also incorporate reports from peers, teachers, and parents to comprehensively assess prosociality of students.

However, there were strengths of the study that could offset the limitations. The study utilized data from four different schools, yielding a large sample size, which allowed to compare and contrast results by school and gender. The emergence of similar patterns of results could establish a strong empirical support for students' adjustment associated with the school dimensions. Similarly, although our study did not have an ethnically diverse sample, a large number of participants that represent HAS students added to the robustness of the study. Finally, to our knowledge, this is the first study that explore potential effects of the school climate dimensions on students' intrinsic aspirations, independent of parent-child and peer relationships.

Conclusion

In conclusion, the main findings of this study indicate the importance of having caring adults at school for intrinsic aspirations among students in HASs. The links between caring adults and intrinsic aspirations were profound in terms of personal growth and well-being of people in communities, compared to aspirations for interpersonal relationships. There were also several links associated with time pressure and the AIR subscales, suggesting the need for future research exploring the influence of time pressure associated with extracurricular activities on adjustment. The overall findings have implications for research and practice to promote close relationships with adults at school to enhance wellbeing of HAS students.

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Table 1. Descriptive Statistics of Variables Separately by School and Gender

Variable	School A		School B		School C		School D		Sex	School
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls		
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	*F*	*F*
Withdrawn/Depressed	3.35 (3.17)	3.93 (3.28)	3.33 (3.41)	3.95 (3.25)	3.77 (3.47)	3.58 (3.22)	3.64 (3.75)	4.35 (3.67)	12.61***	n/s
t-score	56.32	56.73	56.49	56.72	57.47	55.91	57.43	58.03		
Rule-Breaking	4.87 (4.64)	3.94 (3.43)	5.32 (5.06)	4.15 (3.54)	4.55 (4.39)	3.51 (3.36)	5.42 (5.52)	4.08 (4.20)	47.08***	3.85**
t-score	55.98	54.82	56.81	55.09	55.33	54.20	57.13	55.19		
Time Pressure	3.26 (1.05)	3.73 (0.84)	3.37 (1.05)	3.76 (0.94)	3.41 (1.02)	3.82 (0.93)	3.43 (1.06)	4.06 (0.93)	194.09***	11.62***
Peer Victimization	4.11 (1.54)	4.40 (1.35)	4.87 (2.02)	4.69 (1.41)	4.50 (1.96)	4.62 (1.48)	4.49 (2.20)	4.63 (1.75)	n/s	8.15***
Help Seeking from Adults at School	1.41 (1.35)	1.55 (1.30)	1.35 (1.27)	1.51 (1.32)	1.33 (1.22)	1.67 (1.21)	1.37 (1.29)	1.52 (1.35)	17.86***	n/s
School Caring Adult	3.65 (0.74)	3.55 (0.73)	3.52 (0.81)	3.55 (0.72)	3.66 (0.84)	3.83 (0.81)	3.24 (0.88)	3.09 (0.79)	n/s	86.66***
School Diversity	3.67 (0.91)	3.73 (0.72)	3.44 (0.97)	3.63 (0.75)	3.71 (0.77)	3.82 (0.74)	3.28 (0.82)	3.35 (0.74)	7.28**	50.73***
Attachment with Parents	101.52 (15.76)	99.10 (16.96)	101.29 (15.48)	99.08 (17.51)	99.65 (15.60)	98.64 (18.59)	98.88 (16.62)	99.71 (18.02)	n/s	n/s
AIR-Community	5.09 (1.43)	5.54 (1.18)	5.38 (1.34)	5.76 (1.13)	5.29 (1.37)	5.98 (1.03)	5.09 (1.40)	5.62 (1.26)	116.14***	88.80***
AIR-Relationships	6.04 (1.15)	6.22 (0.96)	6.15 (1.11)	6.58 (0.71)	6.18 (1.03)	6.52 (0.82)	5.75 (1.27)	6.21 (1.11)	79.33***	21.01***
AIR-Personal Growth	5.95 (0.97)	6.16 (0.77)	5.99 (0.98)	6.33 (0.71)	6.00 (0.98)	6.38 (0.71)	5.65 (1.14)	5.97 (1.02)	70.81***	25.31***

Note. n/s = not significant at $p < 0.05$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 2. Regression Analyses for Intrinsic Aspirations (Community) by School and Gender

	School A		School B		School C		School D	
Variable	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Withdrawn/Depressed	-0.09	-0.07	-0.02	0.07	-0.02	-0.04	-0.04	0.02
Rule-Breaking	-0.16*	-0.16*	0	-0.12	-0.12$^{\wedge}$	-0.08	-0.04	-0.08
Time Pressure	0.10	0.22***	0.18**	0.1	0.15**	0.10$^{\wedge}$	0.23***	0.24***
Peer Victimization	0.15*	-0.11$^{\wedge}$	-0.04	-0.04	0.04	0.08	0.08	0.01
School Caring Adult	0.15*	0.17*	0.21**	0.17*	0.19**	0.25***	0.17**	0.11*
School Diversity	0.07	0.10	0.07	0.09	-0.02	0.12*	0.07	0.08
Attachment with Parents	0.09	-0.04	0.14*	-0.02	0.22***	0.05	0.09	0.05
$R^2 \Delta$	0.12***	0.17***	0.12***	0.07**	0.14***	0.13***	0.12***	0.09***
AIR-Relationships	0.18**	0.15**	0.09	0.07	0.12*	-0.04	0.30***	0.16**
AIR-Personal Growth	0.42***	0.47***	0.46***	0.53***	0.47***	0.60***	0.41***	0.59***
$R^2 \Delta$	0.25***	0.26***	0.24***	0.28***	0.28***	0.28***	0.38***	0.45***
Total R^2	0.37	0.43	0.36	0.35	0.41	0.42	0.50	0.54

Notes. Standardized estimates are shown; $^{\wedge}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Table 3. Regression Analyses for Intrinsic Aspirations (Relationships) by School and Gender

	School A		School B		School C		School D	
Variable	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Withdrawn/Depressed	-0.17*	-0.29***	-0.11	0	-0.04	-0.02	-0.04	-0.05
Rule-Breaking	-0.05	-0.01	0.04	0.03	0.13*	0.06	-0.01	0.05
Time Pressure	0.28***	0.10^	0.20**	0.23***	0.18**	0.07	0.23***	0.25***
Peer Victimization	0.07	0.06	-0.01	-0.12^	-0.05	0.11^	0.00	0.08
School Caring Adult	0.09	0.12^	0.20**	0.09	0.04	0.23***	0.01	0.05
School Diversity	0.10	-0.03	0.01	0.09	0.08	0.22***	0.20***	0.12*
Attachment with Parents	0.05	0.09	0.03	0.08	0.35***	0.10^	0.10^	0.13*
$R^2 \Delta$	0.15***	0.14***	0.09**	0.08**	0.15***	0.17***	0.11***	0.10***
AIR-Community	0.16**	0.20**	0.08	0.07	0.11*	-0.04	0.23***	0.14**
AIR-Personal Growth	0.51***	0.20**	0.60***	0.47***	0.55***	0.62***	0.61***	0.64***
$R^2 \Delta$	0.31***	0.11***	0.36***	0.24***	0.35***	0.30***	0.51***	0.50***
Total R^2	0.45	0.25	0.45	0.32	0.50	0.47	0.62	0.60

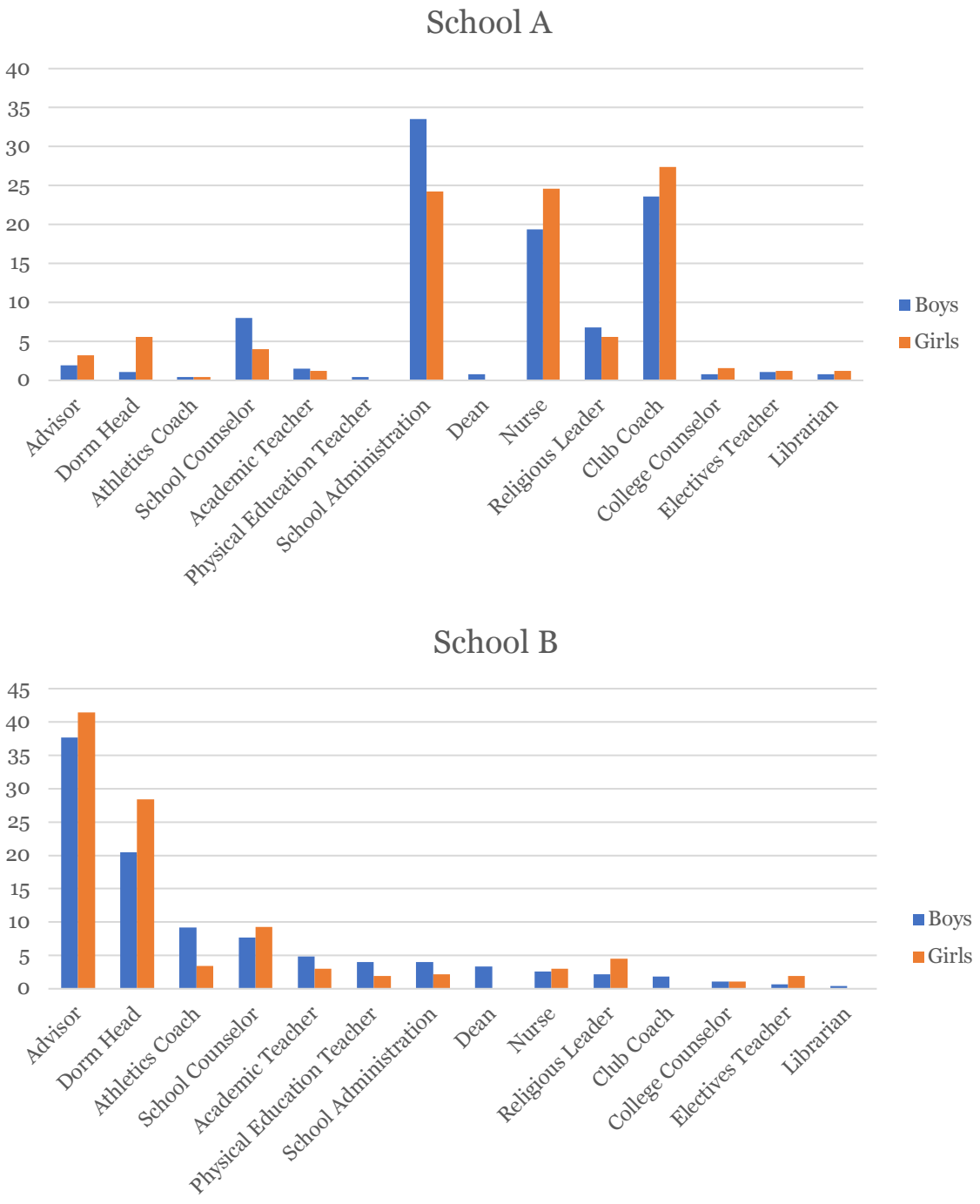
Notes. Standardized estimates are shown; ^$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

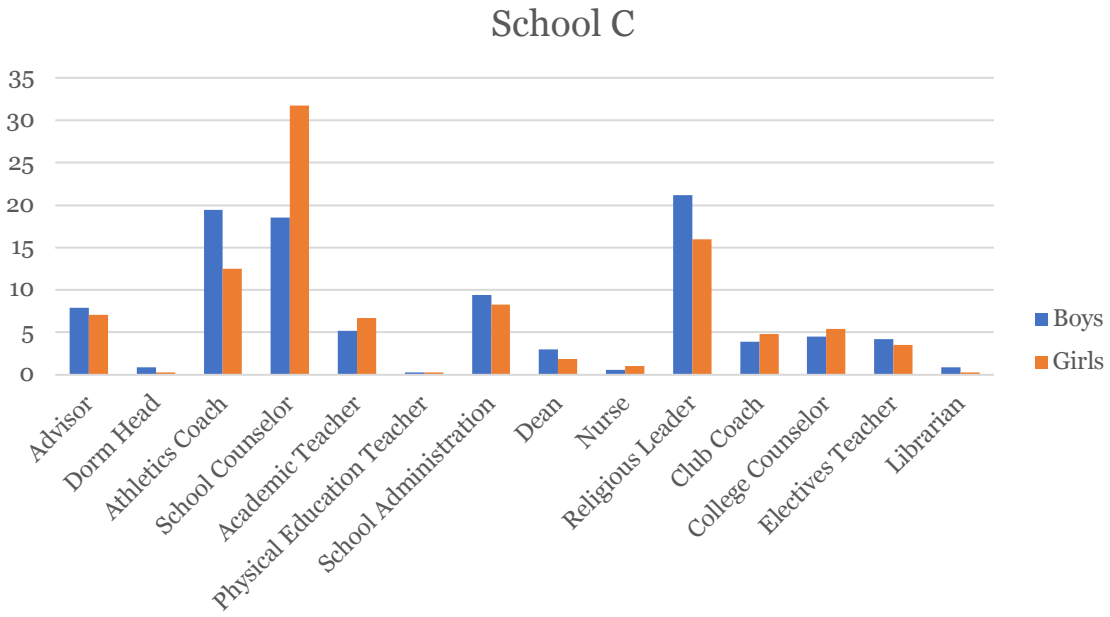
Table 4. Regression Analyses for Intrinsic Aspirations (Personal Growth) by School and Gender

	School A		School B		School C		School D	
Variable	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Withdrawn/Depressed	-0.01	0.09	-0.05	0.11	0.03	0.04	0.00	0.08
Rule-Breaking	-0.02	0.04	-0.05	-0.08	0.09	0.06	-0.03	-0.03
Time Pressure	0.19**	0.10	0.24***	0.16**	0.09^	0.09^	0.25***	0.24***
Peer Victimization	-0.02	-0.04	0.09	-0.16*	-0.14*	0.08	-0.09^	0.00
School Caring Adult	0.24***	0.20**	0.16*	0.17**	0.10^	0.23***	0.04	0.12*
School Diversity	0.07	0.08	0.08	0.08	0.03	0.20**	0.18**	0.15**
Attachment with Parents	0.15*	0.13^	0.16*	0.03	0.23***	0.14*	0.08	0.09^
$R^2 \Delta$	0.16***	0.09**	0.13***	0.11***	0.09***	0.16***	0.14***	0.11***
AIR-Community	0.32***	0.52***	0.32***	0.42***	0.36***	0.42***	0.29***	0.40***
AIR-Relationships	0.44***	0.16**	0.49***	0.36***	0.50***	0.47***	0.56***	0.50***
$R^2 \Delta$	0.36***	0.29***	0.42***	0.37***	0.45***	0.44***	0.51***	0.58***
Total R^2	0.52	0.38	0.55	0.48	0.55	0.60	0.65	0.69

Notes. Standardized estimates are shown; ^$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Figure 1. The Proportions of Students' Confiding with Adults at School

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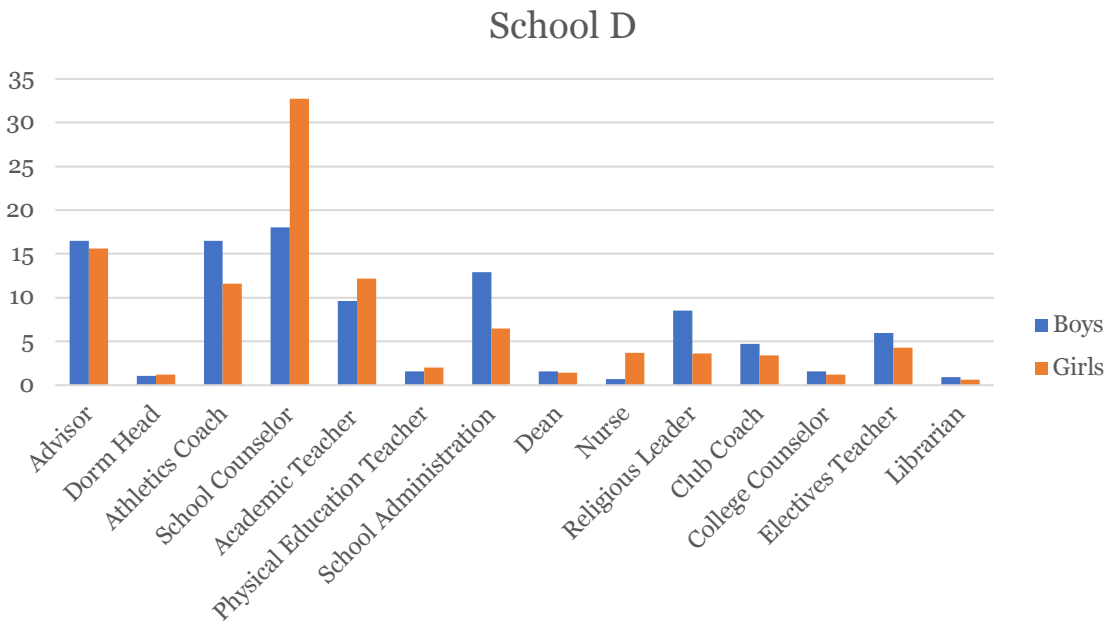
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College Counselor
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CHAPTER 4

A CRITICAL EVALUATION FOR THE CONSTRUCT OF ADVERSE CHILDHOOD EXPERIENCES

In the past decades, there has been an explosion of collaborative work in research and practice in the field of Adverse Childhood Experiences (ACEs). Exposure to harmful environmental factors can start as early as prenatal stages; such experiences jeopardize the cognitive development in children, resulting in lasting effects in their adulthood (Price et al., 2017). Thus far, a higher dose of ACEs—i.e., exposure to higher numbers of adversities—has shown associations with health problems, such as illicit drug use (Dube et al., 2003), suicidal behavior, internalizing problems (Poole et al., 2017; Wingo et al., 2010), and a range of physical symptoms (e.g., digestive problems; Bellis et al., 2018).

Another striking finding across the past research is that ACEs are ubiquitous regardless of socioeconomic and cultural backgrounds. Increasing evidence also supports that ACEs are disturbingly prevalent in not only low-income, minority groups (Wade et al., 2014) but also middle to upper-middle class communities (Luthar et al., 2021a). The impact of social and economic factors, such as poverty, starts as early as birth of a child because those factors have connections with the quality of growth environments, including safety and nutrition (Braveman et al., 2014). While poverty is widely known to jeopardize child development (Chaudry & Wimer, 2016), adversities can still exist even within communities that are considered as "better off"—in a way that has not been fully captured in the conventional ACEs screening tools.

Given the pervasiveness of childhood adversities, there has been a call for increased public surveillance and early interventions for at-risk children and families; supporting healthcare professionals in primary care is an important way to do so. As of January 1st, 2020, the California Department of Health Care Services started providing

reimbursement to Medi-Cal providers to reinforce universal screening of ACEs and referrals to appropriate resources upon children's wellness visits; this new mandate involves 8,800 clinics and 100,000 providers that would potentially impact 7 million children under the healthcare system (Fernandes, 2019). In the meantime, there has been a proliferation of trauma-informed care in practice to address the prevalence of adversity and trauma in a society and the importance of meeting the underlying needs in public health. Organizations at larger levels, such as the Centers for Disease Control and Prevention (CDC), have also been providing ample up-to-date resources for public education.

However, the concept of ACEs is still relatively nascent, along with its methodological approaches to measure one's cumulative exposure to negative past experiences. As the measurement criteria for what should be considered as ACEs vary in research, such inconsistency can cause confusion among researchers and practitioners. Another limitation is that ACEs research has been mainly focusing on the prediction of disease outcomes. Recently, several researchers noted that the next paradigm shift should occur with integrated models with protective mechanisms. Accordingly, some suggested ways to 1) enhance protective systems spanning multiple ecological levels (e.g., Sciaraffa et al., 2018) and 2) implement trauma- and resilience-informed policies, with a more balanced perspective on adversity and well-being (Ferrara, 2018).

In addressing the aforementioned issues, the present paper will first provide a historical overview of existing definitions and conceptual frameworks that posited the disease trajectories associated with the exposure to adversities. Then, we will discuss methodological approaches and limitations in the current scheme of examining childhood adversities. Lastly, the study will discuss implications for future research on ACEs that are related to the identified limitations.

History of ACEs research: Definitions and Conceptual Meaning

For decades, research in public health (Anda et al., 2010), developmental psychology (Luthar et al., 2015), and social work (Larkin et al., 2014) have described complex mechanisms of childhood adversity on children's wellbeing. In the mid 1990s, Felitti and colleagues (1998) found that the cumulative exposure to childhood adversities have strong dose-response relationships with a number of disease outcomes and mortality. Unlike past studies which focused on the impact of a single type (i.e., divorce and physical abuse), the primary focus of this ACEs research was on a wide range of past adversities that together lead to incremental impairments of health. The majority of participants in Felitti et al.'s study had two or more ACEs despite the fact that all participants were enrollees of the Kaiser Health Plan and in a middle-income, highly educated group.

With increasing attention to ACEs as major threats to health, researchers introduced several definitions with the effort to operationalize the concept. Table 1 shows the most commonly used definitions of ACEs in research and practice, followed by Felitti et al.'s (1998) study. As shown there, the term ACEs refers to childhood abuse/neglect associated with psychological, physical, and contact sexual abuse, as well as household dysfunction (e.g., parental divorce/separation) that one experienced before the age of 18 years (Felitti et al., 1998). Accordingly, the definitions in Table 1 indicate a range of abuse, neglect, and types of household dysfunction while some also included a few other types of adversities, such as experience of foster care (e.g., Cronholm et al., 2015).

Adverse childhood experiences pertaining to abuse and neglect are further categorized into four groups (i.e., physical abuse, sexual abuse, emotional abuse, and neglect; NASEM, 2019). According to the descriptions of child maltreatment by the CDC

(Fortson et al., 2016), *physical abuse* is the intentional usage of physical force to cause physical damage; *sexual abuse* is forcing a child in attempt to engage in sexual behaviors; *emotional abuse* as a set of acts damage self-worth and emotional well-being of a child; finally, *neglect* is failing to provide necessary support and resources for physical and emotional needs of a child. At the family level, household dysfunction indicates *living with a user of illegal drugs/alcohol*, *a mental illness*, and/or *attempted suicide*. Witnessing domestic violence and living with a previously convicted person are also part of this dimension.

Meanwhile, some researchers indicate that ACEs are not limited to the individual and family levels (Anda et al., 2010), and that definitions should be extended to broader ecological realms, such as community and school. These are all contexts in which individuals spend a substantial amount of time on a daily basis, and thus, can have salient influences on well-being. Examples of community- and school-level adversities may include discrimination (Geisz & Nakashian, 2018), unsafe neighborhood, and bullying (Cronholm et al., 2015).

Conceptual Frameworks of ACEs

An ecobiodevelopmental framework (Shonkoff et al., 2012) and biopsychosocial model (Engel, 1977; Felitti et al., 1998) are most widely accepted conceptual models for ACEs. As implicated in their names, they are grounded in evidence from various disciplines describing the complex pathways from adversities to negative health and social outcomes. Both theoretical explanations are similar; however, the latter highlights that adverse experiences during the developmentally sensitive periods (e.g., the first trimester of pregnancy) can result in poor prognosis in the child's physical and mental health (Shonkoff et al., 2012).

First, a biopsychosocial approach integrates the biological, psychological, and social aspects to operationalize the heterogenous pathways to disease outcomes (Nelson et al., 2017). In terms of the biological aspect, allostasis is a crucial function for survival as to maintain the stability of physiological systems when an environmental stressor is present (Danese & McEwen, 2012). The key components to operate allostasis are the nervous, endocrine, and immune systems; as these systems are highly amalgamated, damages in one system may cause cascade effects on the other (Danese & McEwen, 2012). Sometimes, the stressful situation lasts for a prolonged time and/or the number of stressors increase. Then, the physiological demands in order to deal with the stressor can outweigh the availability and resources to cope; this results in excessively high levels of allostatic load (Larkin et al., 2014).

Another important aspect of the biopsychosocial approach pertains to psychological comorbidities and cognitive factors (Nelson et al., 2017). Increasing evidence supports that disrupted balance in the emotional and behavioral functioning links to mental health problems, including anxiety and depression. Stress caused by *uncontrollable* living environments can be associated with lack of safety and helplessness (LoPilato et al., 2020). Although the ability to cope largely depends on a number of factors including genetic dispositions and available social resources, individuals who faced ACEs multiple times are more likely to appraise innocuous events as stressful than those without ACEs (Nelson et al., 2017).

Furthermore, adaptation of maladaptive behaviors (e.g., smoking, drug use) can be the body's attempts to overcome stressful situations when adequate resources are unavailable (Larkin et al., 2014). For example, a compelling explanation for high rates of smoking among people with multiple ACEs is that nicotine contains the addictive properties that temporarily decrease anxiety and depression; thus, these individuals may

self-medicate with the substances in order to ameliorate negative emotional states (Anda et al., 2010; Khantzian, 2003). Similarly, individuals with higher numbers of childhood adversities may gain weight in attempts to 'look less vulnerable' to others, and feel the sense of security (Felitti et al., 1998).

Families and those who share the proximal growth environment (e.g., peers) have salient influences on individuals' adjustments (Nelson et al., 2017). Parents' psychological stress due to parenting are linked with children's internalizing/externalizing problems (Suh & Luthar, 2019). Likewise, disrupted peer relationships can exacerbate adjustment problems and lessen opportunities to develop prosocial behaviors (Moses & Villodas, 2017).

In summary, converging the conceptual descriptions from the past literature led to the following tenets or principles: 1) accumulation of adverse experiences in the family and community contexts negatively affect physical, psychological, and behavioral health; 2) chronic exposure to adversity can have both immediate and lifetime health outcomes; 3) adversities within the family contexts are often intergenerational—which means that problems existed in parents' generation can be transmitted to the offspring. Overall, ACEs concepts pertain the five major features of ACEs: *harmful, chronic, distressing, cumulative,* and *varying in severity* (Kalmakis & Chandler, 2014). What exactly should be incorporated as types of ACEs remains a topic that needs more research work henceforth (which will be discussed more in the next section).

Issues Needing Attention in ACEs Research

1. There is No Consensus Among Researchers on How to Define ACEs. The Types of Adversity in the Current ACEs Criteria are not Consistent.

While the findings of ACEs studies alone have meaningful epidemiological implications, inconsistencies in its definition and types of adversity in the current ACEs

measurements can compromise effective communication among researchers (for similar issues regarding a related construct, "resilience," doing well in the face of adversity, see Luthar et al., 2000). Adverse childhood experiences are often used interchangeably with *child maltreatment*, *early life adversities,* and *traumatic childhood experiences,* or *childhood trauma* in research studies and policy reports (e.g., NASEM, 2019; Geisz & Nakashian, 2018). As discussed earlier, childhood adversities are described as, for example, 'potentially traumatic events' (CDC, 2019) or 'traumatic events' (Whitfield, 2005)—whereas the other definitions do not include the word *trauma* (see Table 1).

In the current literature, there are unclear classifications of childhood adversity and trauma (McLaughlin, 2016). Examples of ACEs indicators, i.e., neglect, poverty, and the absence of a supportive caregiver, are not usually considered as traumatic *per se*, as opposed to domestic violence and sexual abuse (McLaughlin, 2016). It is difficult to presume that all ACEs indicators result in toxic levels of stress and demand substantial adaptation followed by an adverse event.

The second point can be made with regard to the narrow definition of ACEs which is originally adapted from the ACEs study conducted by Felitti and colleagues (McEwen & Gregerson, 2019). In the literature on childhood adversity and resilience, adversity refers to a negative life event that has a statistical association with maladjustment (Luthar et al., 2000); in general, the concept of adversity encompasses a broad range of harmful environmental factors, such as racism and poverty. However, most ACE survey instruments focus on measuring abuse, neglect, and household dysfunctions in approximately 10-item questionnaires—whereas types of adversity that are salient in child development can extend well beyond the nine ACE items proposed by the original study.

Such limitations can influence the validity and reliability issues in measurement of the construct, as well. Validity is undermined by narrow content that only represents a small fraction of the construct (Clark & Watson, 1995). Also, psychometric tests for reliability (e.g., Cronbach's alpha) are not applicable in ACEs due to the nature of its measurements that are comprised of a list of yes/no questions. A single question represents each of the underlying adversity type; even then, those questions are inconsistently found in measures of ACEs due to various reasons (e.g., not having data available to measure all adversity in secondary analysis; having to limit a number of questions due to survey feasibility).

Lastly, the variations in types of ACEs measured in studies can limit the ability to compare and contrast findings. The ACE-related items in the National Survey of Children's Health—which is administered annually to assess children's physical and psychological health and healthcare utilization—do not include sexual abuse, emotional abuse and neglect (CAHMI, 2018). Another ACEs study (Choi et al. 2020) administered measures with additional items, e.g., natural disaster, animal attack, and medical trauma.

2. The ACEs Measurement May Lack Contextual Relevance to Certain Individuals, Families, and Communities; Therefore, the Measurement Should Move Beyond Utilizing a Uniformed Set of Questionnaires to All of Its Respondents.

There are variations in types of adversity experienced by individuals due to unique cultural and societal factors shared within their communities. A universal screening tool may not fully capture such differences in the composition of adversities by contexts.

Variations in Types of Adversity by Context

Consider, for example, variations as a function of socioeconomic status. The relation between poverty and adversity is well-reported as shown by high prevalence of adversity in impoverished communities (Bruner, 2017). In low-income households, multiple adversities, such as unsafe neighborhood environments and food insecurity, often co-occur. This is also richly illustrated by a qualitative study with a group of youth in a low-income urban area in Philadelphia; participants perceived discrimination, child welfare/juvenile injustice, unsafe community environment, and single-parent home, as significant adversities in their communities (Wade et al., 2014).

Likewise, middle to upper-middle class youth experience their own set of unique risks. For example, lack of preadolescents' afterschool parental supervision (which can connote neglect) and high levels of parental criticism (suggesting emotional abuse) have been shown to connote vulnerability to adjustment problems (Luthar et al., 2020). In fact, a recent ACE study with HAS youth revealed considerable proportions of students who had experienced ACEs at the time of survey—mostly, in forms of maternal and paternal depression, and feelings of insufficient time spent with mothers and with fathers (Luthar et al., 2021). The latter dimensions are not typically captured in measures of ACEs; in this cited, they were included in a new "Proxy-ACEs" self-report rating scale.

In addition, another area of adversity that haven't been addressed in ACEs studies is experiences of immigrant children. Those who moved to the United States without their parents are likely to have poor health outcomes compared to those who migrated with their parents (Lu et al., 2020). With stricter boarder regulations and immigration requirements, children may need to adjust to new environments in the destination country while parents undergo legal processes of immigration. After family

reunification, these children experience another separation in which this time, from caregivers. Repeated separation during early ages add to acculturation difficulties and stress caused by changes in the family system (Lu et al., 2020).

Similarly, some items in the conventional ACE surveys are irrelevant to certain individuals. For example, the experience with parental divorce/separation is not applicable to those who were born in single-parent households (Wade et al., 2014). This requires a careful refinement of ACEs questionnaires—by adding words 'growing up in a single-parent or child-headed household—in the effort to make the questions appropriate to a broader population.

Need to Add Emergent Issues That Potentially Have Adverse Influences

The measurements of ACEs may not cover a number of emergent social and environmental issues, such as pressure to succeed (NASEM, 2019), school shootings (Rees et al., 2019), natural disasters (Rosellini et al., 2018), and effects of social media (Twenge, 2019). These examples are less frequently discussed as central problems in the ACEs literature, despite probabilistic negative health consequences associated with them. High pressure to succeed, or to outdo peers in accomplishments, has been established as a major vulnerability factor for adolescents' mental health (Luthar et al., 2020; NASEM, 2019). Again, this has not been addressed in previous ACE studies, to the authors' knowledge.

To further illustrate with regard to online activities, the more teens have access to smartphones, the greater exposure there is for the online vulnerabilities, such as violent contents, social comparisons, and cyberbullying. Social media takes a relatively high proportion of youths' daily lives, given the data showing that on average, adolescents in the United States spent six hours on online activities in 2017 (Twenge et al., 2018). Cyberbullying has been shown to occur in as many as 23% of adolescents between ages

12 to 18 years (Hamm, 2015). Sexual victimization on online platforms is detrimental such that online crimes more difficult to distance victims from perpetuators than in person (Stonard et al., 2017). Teens may refuse to openly communicate their online activities with their parents. There is the need to raise more attention to the detrimental effects of online activities and consider them, specifically, in measures of ACEs.

Importance of Historical Timing

Just as World War II and the Holocaust were uniquely experienced by generations who had lived the specific time of the events, historical timing matters to types of adversity that are commonly shared among people in particular generations. One of the recent examples is the outbreak of COVID-19 (Bryant et al., 2020). As of October 29, 2021, there are approximately 45.8 million cases and 742,000 COVID-related deaths in the United States (CDC, 2021). Measures to prevent further spread of the infectious disease required social distancing by significantly limited in-person services at all levels, such as discouraging non-emergency visits to hospitals and doctors' offices and closing schools. Social distancing placed children and families at greater risks for social isolation, inadequate resources for childcare, and medical support for regular well-child visits—adding more burdens to parents on child rearing.

In addition, sudden loss of jobs and prolonged unemployment significantly deprived financial resources within families. A rise in household child abuse and neglect has already been noted, due to heightened stress levels among parents and decreased reports for potential child abuse from healthcare workers and teachers (Bryant et al., 2020). For children without adequate support, stress responses may persist chronically with ongoing fear of contracting the infectious disease, uncertainty about future, and enforced separation from a close family member who was diagnosed with the illness. Indeed, future research will need to carefully consider how to incorporate the multiple

types of adversity related to the COVID-19 pandemic, for children as well as for the adults taking care of them (Luthar et al., 2021b).

3. The Current Methodological Approaches Do Not Account for Perception of Severity, Type, and Timing of an Adverse Event.

Lacking Explanations on Ill-Effects Shared by ACEs Indicators

The conventional way of measuring ACEs is to ask participants to answer whether they have experienced an event on dichotomous items ('yes' = 1 and 'no' = 0); then, a sum score of the ACEs indicators is created to represent total adverse experiences (Felitti et al., 1998). An ordinal, cumulative ACEs score is used for statistical examinations on the dose response relationships with diverse health anomalies. Benefits of using cumulative scores are 1) offsetting limitations of studies that focus on a single type of adversity which may easily 'overestimate' the strength of the association and overlook other contextual issues (Anda et al., 2010) and 2) increasing feasibility, especially within practice settings where practitioners have a short amount of time during the client's visit.

However, the current methodological approach is not without limitations. With regard to the underlying assumption of "equal effects" for all ACEs indicators, it is unlikely that different types of adversity have the equal magnitude of effects on a child's health—as well as increase the likelihoods of health problems at the same rate. Of note, types of adversity may have different impacts on child development, just as one cannot assume that emotional neglect (e.g., not providing sufficient emotional support to a child) and physical neglect (e.g., failing to provide medical services when needed) operate in the same way. Domestic violence may have larger effects on the child than, say, the fact of parental separation or divorce. McLaughlin (2016) stated that while childhood adversity relates to multiple health outcomes (i.e., multifinality), the current

state of science does not have clear answers to what general pathological mechanisms are shared by ACEs indicators; thus, the 'equal effects' assumption can be premature to make statistical inferences yet.

Furthermore, even within the same construct, the degree to which an individual perceives an event as traumatic can vary. Separation/divorce of parents, for example, often follows long periods of unhealthy relationships of parents (Cohen & Weitzman, 2016). Several studies have shown associations between divorce and negative developmental outcomes among children; conversely, for some, breakup of the family can lead to greater calm and less quarrel in the households with difficult marriages (Eyo, 2018), or separation from an abusive parent. This gives rise to the second limiation regarding the necessity to incorporate subjective perception which will be discussed next.

Variations in Subjective Perceptions of an Event

Effects of adversity on health are likely to depend on one's subjective perceptions of an event that calibrate endocrine and behavioral reactions to stressors (LoPilato et al., 2020); however, the current ACE measurements do not ask about subjective feelings about an experience. Boals (2018) reported that only 37% of participants who objectively experienced trauma referred to the event as traumatic. In the same study, the opposite was also true wherein participants who did not objectively experience levels of trauma—i.e., meeting the DSM-IV's threshold for trauma—still exhibited clinically notable symptoms of posttraumatic stress disorder and depression. Importantly, traumatic events that met both objective and subjective criteria were profoundly associated with mental problems, while the associations were weaker when neither of the criteria was met (Boals, 2018).

The biological changes through stress appraisal may differ by dimensions of adversity and individual factors including sex and cognition. Busso et al. (2017)

elaborated that when dimensions of adversity are largely divided into *threat* and *deprivation* exposures, the threat dimension may require stronger adaptation than the deprivation type in the process of detecting and responding to the stressor. In a study that investigated childhood adversity, stress perception, and morning cortisol levels, childhood adversity significantly altered cortisol levels, only among females with threat exposure (LoPilato et al., 2020). Here, cognition of an experience plays a salient role in determining whether the experience is traumatic, as well as how the body adjusts to it (Boals, 2018).

In addition, it is noteworthy that the perception of an event can change over time when 1) the time of the survey administration move further away from the occurrence of adverse events, and 2) emotional health status at the time of survey influences the memory (Hardt & Rutter, 2004). A related problem is potential recalling biases, especially when childhood abuse is often measured by retrospective, self-report surveys (Lawson et al., 2020). Likewise, existing mental health problems can reframe negative memories which compromises the validity of a retrospective report (Smith et al., 2018).

Timing of Adverse Events

In addition, ACE's questions do not ask about timing of adverse events. An adverse event that occurs more recently at younger ages often result in more severe maladjustment outcomes (Jackson et al., 2016). The first years of life are considered as the critical period of brain development where the most neurodevelopment takes place; damages that occurred during this time period are not easily reversible despite the presence of positive experiences (Perry, 2008). Studies revealed that the exposure to prenatal and early life adversity could increase the risks of health problems, such as borderline personality disorder (Schwarze et al., 2013), cardiovascular, and metabolic

diseases (Slopen et al., 2015). To the authors' knowledge, little is known as to how health outcomes vary by developmental stages that profound levels of adversity take place.

4. Researchers Should Consider Assessing Potential Proximal, Negative Influences in the Ecological Realm That Can Have Stronger Effects Than the Experience of Discrete ACEs.

Another problem is that in focusing on ACEs as representing discrete negative life events or dimensions of parents' mental illness, researchers could be overlooking other very important dimensions that have potentially large effects. Supporting this point are findings from a recent population-based study. A study using the data from National Survey of Children's Health with a nationally representative sample (Suh & Luthar, 2020) found that more so than adverse childhood experiences, parents' aggravated feelings toward their children in the past month had stronger associations with measured adjustment problems of children, even after accounting for demographic variables. Furthermore, the study results revealed that providing emotional support for parenting moderated the relation between parental aggravation and the adjustment problems. This is consistent with what are now central tenets in resilience research, i.e., that the single most important 'protective factor' for children facing adversity is the well-being of the primary caregiver, and this in turn rests on ongoing support for the caregivers as they deal with challenges in their role as parents (Luthar & Eisenberg, 2017; NASEM, 2019). This implies the needs for measures of ACEs to consider factors that might represent serious risks to the well-being of adults who take care of children during times of high adversity.

5. ACEs Research May Require Noble Methodological/Statistical Approaches to More Accurately Assess the Associations Between Childhood Experiences and Health Outcomes.

Several studies imply the possibility of curvilinearity in the associations between adversities and psychopathological outcomes (Herrenkohl et al., 1995). In some instances, the slope of the positive association between ACEs and the likelihoods of negative health outcomes escalates with profound adversity at different rates. Sprang et al. (2009) found that children experiencing maltreatment have higher odds of experiencing other traumatic events. Especially when adversities are present at multiple ecological levels (i.e., home, community, school), the outcomes can be worse, compared to cases where few adversities are present. It is rare to find children who show positive adaptation, or resilience, in the face of chronic, severe maltreatment (Luthar et al., 2015).

This is demonstrated by findings on the quadratic relationship between ACEs and low birthweight, such that low birthweight was most increasingly found among women who experienced extreme adversity (Mersky & Lee, 2019). Similar patterns of results were observed in a study with pregnant women who had experienced emotional and physical intimate partner violence (Tung et al., 2019). Prenatal emotional distress was notably greater among those who reported serious traumatic violence exposure and harsh parenting during childhood than those who had no such history. Interestingly, such findings were not present with no or moderate levels of harsh parenting.

The Current State of Pathological Mechanisms

In considering a dose-response relationship, it is not always the case that the probabilities of health anomalies increase by the same rates with each additional item, and this requires further examination of possible nonlinear associations and the underlying psychopathology mechanisms. The current state of science, however, tells little about general and specific pathological mechanisms of diverse types of adversity;

thus, the count approach may 'oversimplify' unique disease pathways associated with environmental causes (McLaughlin, 2016).

This also leads to a related question on how to examine categories of ACEs (e.g., 0 ACE, 1-3 ACEs, 4+ ACEs) in order to determine *true* at-risk groups. In literature, cumulative evidence has shown that 4 or more ACEs have significant associations with various health outcomes compared to no adversity, based on the odds of maladjustment in various domains of development (e.g., learning/behavior problems, obesity; Burke et al., 2011). In a longitudinal study based on two birth cohorts, however, ACEs did not accurately predict mental and physical health outcomes assessed at 18 years and 45 years, except for suicide attempts (Baldwin et al., 2021). Although this way of classification is widely utilized in both practice and research, such limitations may require changes in defining at-risk groups (McLaughlin, 2016).

Additionally, studies using continuous data show variations in operationalizing levels that constitute "adversity". Studies (e.g., Johnson et al., 2020; Luthar et al., 2021a) utilized data from measurement scales relevant to the ACE construct; the authors dichotomize the continuous variables to be consistent with conventional binary ACEs variables—such as re-coding those with scores a standard deviation of 1 above the sample mean as the presence of the adversity. Such statistical approaches across the ACEs studies may result in losing the richness of continuous variables in statistical tests by dichotomizing them.

Summary

Preceding discussion highlight several constructs that need to be included in future definitions of ACEs, ranging from perceptions of different aspects of the parent-child relationship to multiple aspects of children's everyday lives affected by natural disasters, including the COVID-19 pandemic. To address the expanded concept of ACEs,

we propose the new definition of ACEs—that is *exposure to events or environments within a household, community, or culture that directly or indirectly influence children's developmental outcomes before the age of 18 years*. This new definition covers a broad range of adverse experiences (listed in Table 2) occurring at personal, family, community/societal, and cultural levels.

Future Directions for Research on ACEs

The following section will discuss directions for future research on ACEs, based on the aforementioned key conceptual and methodological limitations. Then the following section will discuss additional suggestions on statistical testing of disease pathways, feasibility of survey administration, and ethical considerations.

Contextually Salient or Relevant Risks

Beyond screening for the current ACE items (e.g., physical/emotional abuse and neglect, and household dysfunctions), future measures need to include both universal and contextually salient criteria that are applicable to particular groups (for similar suggestions regarding a related construct, "resilience," see Luthar et al., 2000). Operationalizing adversities need ongoing investigation on cumulative empirical evidence supporting proposed adversities and their impacts on adjustment outcomes—especially those that are frequently seen in multiple samples within similar contexts (Maner, 2014).

As mentioned previously, in the context of high achieving communities as an example, researchers may ask about excessive pressure to succeed, parental criticism, and lack of parental supervision after school. While screening immigrant children for ACEs, additional questions, such as separation with parents and immigration-related stress, can be helpful to capture adversities uniquely experienced by this population. Likewise, existing questions, such as parental divorce/separation, can be altered to

include diverse experiences that are related to the construct—e.g., experiences in growing up in single parent households. This is because, those who were born in single-parent households may have different experiences from those whose parents have recently undergone the process of divorce. Such children instead have challenges found in single-parent households.

Contemporary Dimensions

Second recommendation is to consider contemporary types of adversity that have influenced children's development yet have not been assessed in the current ACE questionnaires. Examples include a wide range of experiences associated with the COVID-19 pandemic and community violence (e.g., protests and riots) related to racial conflicts and political issues. Not only the ways to respond to the pandemic, such as parents' job loss, social isolation, and school closures, could raise concerns for ACEs, the pandemic itself also induces toxic stress, especially among underserved families (Sanders, 2020). New questions may ask children or their parents regarding COVID-19-related stress symptoms. Example items include whether the pandemic raised fear of contracting the disease and losing family members, or the extent to which this public health crisis has influenced their lives.

Subjective Measure of Adversity

Depending on how traumatic or stressful an experience was for an individual, not all types of ACEs have an 'equal effect' on health. As discussed earlier, adverse events that are both subjectively and objectively traumatic have better predictions to health outcomes; when neither of the subjective and objective criteria for trauma is met, the screening of trauma does not successfully define trauma or forecast health complications (Boals, 2018). Future ACE measures should include subjective perceptions by asking how stressful or traumatic each type of ACEs endorsed is on a Likert scale (e.g.,

responses range from 'not stressful at all' to 'very stressful') or in the yes/no format (e.g., one may ask, 'was the experience so stressful that it significantly compromised your ability to complete tasks for daily living?').

A qualitative or mixed methods approach allows individuals elaborate on their experiences concerning ACEs. This provides additional information to identify adversities that are not previously identified in the survey measurement. At the end of the survey administration, researchers may ask an open-ended question about other types of trauma that are mentioned previously. In addition, such methodological approaches allow researchers to focus on areas where individuals need the most help. In a qualitative study by Kaplan et al. (2013), focus group participants described how toxic stress, or excessive levels of stress, led to poor health outcomes through elevated detrimental health behaviors, such as self-medication, sleep deprivation, and discounting the future.

Methodological Approaches to Account for Frequency and Timing

There is the need to utilize methodological approaches that account for the frequency and duration of an adverse experience. In a retrospective study, researchers may incorporate survey questions about the *frequency/span* (e.g., once a week, several times a week, 10+ times during childhood for physical abuse) and *timing* of an event occurrence (e.g., current, several months ago, one year ago).

Future research should also explore experiences in prenatal stages and the first five years of life. Prenatal environmental adversity, such as a diagnosis of fetal alcohol spectrum disorder (Flannigan et al., 2021) and maternal depression (Glover & Capron, 2017), can be examined by reviewing clinical records or interviews with families. Due to difficulties in recalling memories of experiences at such early life stages, prospective and retrospective reports from parents are necessary.

The Possibility of Curvilinear Links with Health Outcomes

Defining At-Risk Groups

Given the fact that negative health outcomes escalate with profound adversity at different rates, it is worth examining the curvilinearity of the associations between a number of adversity and health outcomes. In past research, those with extreme adversities had significantly greater risks of health problems; most ACEs studies utilized the cutoff of four or more ACEs to define at-risk individuals (Burke et al., 2011) or 1-3 ACEs with at least one health issue. In classifying at-risk groups, future research should account for other factors (e.g., severity, frequency) that influence varying rates of incremental changes in health outcomes. Possible is that those with the ACE score of one still suffer from their experiences if the events were perceived as traumatic and occurred frequently. This research would also provide a better picture for practitioners in defining at-risk cases of ACEs.

Adversity and Adjustment Trajectories

In addition, longitudinal designs are necessary to track not only changes in levels of adversity, but also short- and long-term adjustment trajectories followed by ACEs. The dynamic changes in the severity of adversity predicted different adjustment outcomes in adulthood; in a longitudinal study, those who experienced decreased or increased to moderate levels of adversity during childhood showed comparable depression risks to those who experienced high levels of adversity (Tracy et al., 2019). In addition, trajectories of adjustment outcomes can forecast risks of diseases and identify individuals and families that need immediate medical assistance. In this case, the dimensions of outcomes tested should be appropriate to developmental stages and include both positive and negative adjustment outcomes when investigating the ill-

effects of ACEs on health (Luthar et al., 2000). This is because individuals may perform fairly well in one dimension while they fail to meet expectations in other dimensions.

Proximal Parents' Well-being and Vulnerability

For younger children whose functioning depends heavily on others, i.e., primary caregivers, it would make more sense to measure adjustment at the proximal level including the parent-child relationship (Luthar et al., 2014). There are possible intergenerational transmissions of adversities from parents to children, and some constructs of ACEs (e.g., physical and emotional abuse) are often family adversities, rather than individual problems. Therefore, future ACE research should not only focus problems at the individual level but also consider the families as a whole with the emphasis on primary caregivers.

In addition, future ACE studies should consider examining dimensions of parents' current mental health to investigate how family adversities impact parents' health and parenting behaviors. The current ACE question on parents' mental health (e.g., was a household member depressed or mentally ill, or did a household member attempt suicide?) is rather vague and does not provide enough information on this matter. However, the current parents' negative feelings due to parenting (which were measured in the construct of parental aggravation) have strong relationships with children's adjustments (Suh & Luthar, 2020). In addition to children's adjustment outcomes, various parent-related indices, such as perceived stress due to parenting and parenting behaviors, could be analyzed as dependent variables to test the effect of family adversity.

More importantly, screening of parents' wellbeing in itself may not be useful unless salient protective processes are set in motion and sustained. In addition to administering an ACEs survey, researchers may ask parents about the current burdens of

parenting and an available support system. This is a central and important task for researchers invested in fostering resilience among vulnerable children because it illuminates ways to ensure that salient adults receive ongoing support that helps to maintain their own positive mental health.

Additional Considerations

Statistical Testing of Direct and Indirect Pathways

More research needs to investigate direct and indirect pathways from ACEs to disease outcomes through hypothesized mediating factors in diverse populations and contexts (for example, see Nurius et al., 2019). Testing of path models or mediation models can provide clear pictures as to what factors should be targeted in future interventions in order to delay the onset of relevant health problems.

Another topic that could be informative to the current state of literature on ACEs is possible pathways from maternal exposure to childhood adversities to their offspring's' health outcomes. Maternal ACEs is known to have links with children's development outcomes through prenatal and postpartum health risks (Racine et al., 2018) and mothers' mental health and poor attachment with their children (Cooke et al., 2019); this evidence support possible transmission of adversities from one generation to another because of biophysical and behavioral pathways (Racine et al., 2018).

Ethical Concerns

There has been an ongoing debate on whether to implement the current ACE assessments as a routine pediatric enquiry due to mixed arguments on the effectiveness of such screening tool. While ACE screening tools are widely accepted by both practitioners and patients (Koita et al., 2018), researchers have also brought up ethical considerations with regard to inquiring on one's trauma as recalling the memories of the experiences may trigger associated negative emotions (e.g., sexual abuse; Decker et al.,

2011). Surprisingly, very little or no research included detailed explanations on participants' perception regarding the survey, as well as outcomes of follow-up service utilization after survey administration (Ford et al., 2019).

In addition, there are some concerns over the implementation of the ACEs survey in community or practice settings—especially where there is limited time available for each visit (Ford et al., 2019). A review of literature on ACEs screening as routine enquiry by Ford et al. reported that organization support is necessary and should be accompanied by training or education for practitioners and clear communication on the purpose of this screening. It is also important to have effective communication with survey respondents (e.g., patients, clients, study participants). Previous research reported that parents have favorable attitudes toward the screening of ACEs when it is accompanied by a careful, person-centered approach (Conn et al., 2018). Proper follow-up protocols to reduce discomfort and allocate resources for the participants should be included as a part of care, especially when there has been increased use of ACE measures in research and practice.

Conclusion

In summary, a cumulation of findings from past ACEs studies brought increased public awareness to tackle a number of health and societal issues related to childhood adversity. At the same time, policies to promote public surveillance of childhood adversity started to be widely implemented in practice settings nationwide. Despite the notable advancement and effort made to improve the understanding of ACEs, it is worth considering more deeply the current conceptual and methodological limitations in the current state of science to study the complex phenomena of childhood adversity. To do so, this article identified several limitations to suggest directions for future empirical research: 1) to include contextually and contemporarily salient types of adversity in

revised versions of ACEs questionnaires in addition to existing questions, 2) to incorporate subjective measures of adversity, 3) to account for frequency and timing, 4) to consider the possibility of curvilinear links between numbers of adversity and health outcomes, and 5) to measure proximal caregivers' well-being and vulnerability that affect parenting.

The first step could be to expand the existing definition of ACEs to enable a broader range of adversity to be recognized. As aforementioned, this article suggested a new definition: *an exposure to events or environments within a household, community, or culture that directly or indirectly influence children's developmental outcomes before the age of 18 years*. Figure 1 shows a visual representation of how the future indices of ACEs should be formulated. In a revised version, a comprehensive set of questions need to reflect both universal and contextually salient types of adversity at the levels of family, community, and culture.

Ongoing interdisciplinary efforts among researchers and practitioners from various disciplines are imperative. It is because creating a comprehensive measure of ACEs is as important as to ensure the feasibility of the measure in actual practice settings where times and resources are limited. Measuring severity, frequency, and timing of an adverse event could be informative in prioritizing care needs for individuals. In addition, a selection of questionnaires to measure contextually salient criteria require insights from experts who closely work with a particular population. Last, parents' well-being should be examined because most ACEs are intergenerationally transmitted within proximal family members (Narayan et al., 2021). As the science of ACEs increases in knowledge of the complex phenomena of childhood adversity, preventive interventions will become increasingly sophisticated and effective in protective vulnerable children and families.

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Table 1. Commonly Used Definitions of Adverse Childhood Experiences (ACEs)

First Author	Year	Definition of ACEs
Felitti	1998	Childhood abuse that are largely categorized as psychological, physical, and contact sexual abuse, as well as household dysfunction (e.g., parental divorce/separation) that one experienced before the age of 18 years
Whitfield	2005	The traumas that included: abuse [emotional, physical, and sexual], witnessing domestic violence, parental separation or divorce, and living with substance abusing, mentally ill, or incarcerated household members as a child
Anda	2010	The experiences that include (but should not be conceptually limited to) abuse (emotional, physical, sexual); neglect (emotional, physical); and growing up in households where domestic violence is witnessed, members abuse alcohol or drugs or have mental illnesses, there is relational stress (such as separation or divorce), or members exhibit criminal behaviors
Kalmakis	2013	Childhood events, varying in severity and often chronic, occurring in a family or social environment and causing harm or distress
Nurius	2015	Experiences such as maltreatment, neglect, witnessed violence, and household dysfunctions such as parental mental illness or substance abuse, and incarceration of one or more family members
Robert Wood Johnson Foundation	2021	Traumatic childhood events such as abuse, neglect, and witnessing experiences like crime, parental conflict, mental illness, and substance abuse can result in long-term negative effects on learning, behavior and health
Center of Disease Control and Prevention	2019	Potentially traumatic events that occur in childhood which include violence abuse, growing up in a family with mental or substance use problems
World Health Organization	2019	Some of the most intensive and frequently occurring sources of stress that children may suffer early in life which include multiple types of abuse, neglect, violence between parents or caregivers, other kinds of serious household dysfunction (such as alcohol and substance abuse) and peer, community, and collective violence

Note. n/a = not applicable because no conceptual framework was provided.

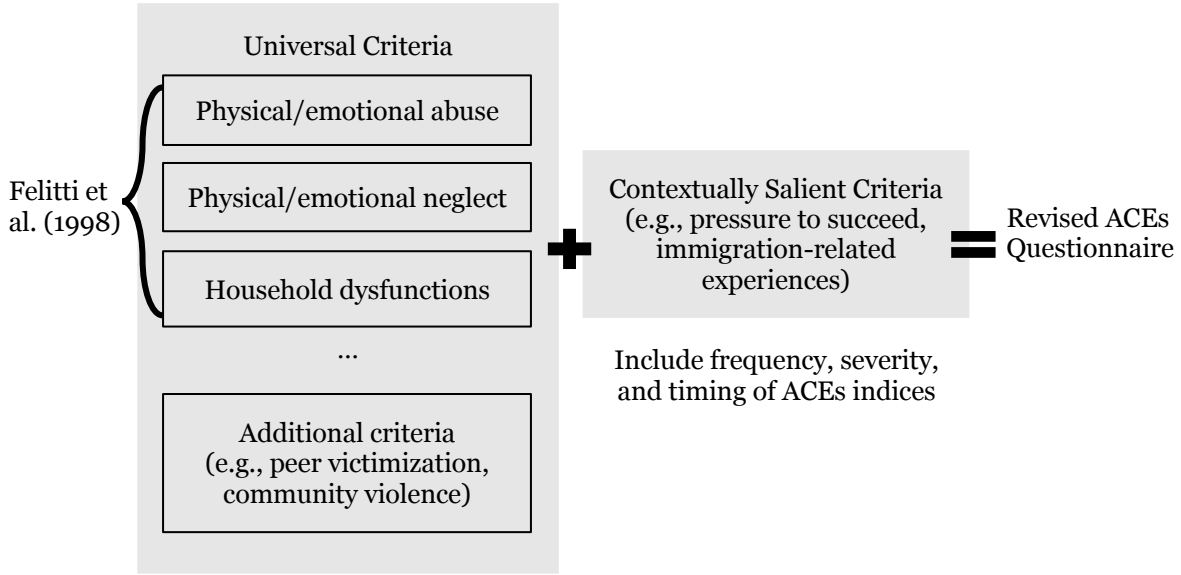
Table 2. Examples of Existing and Possible Types of Adverse Childhood Experiences (ACEs)

Category	Type	Example
Personal	Medical Trauma[a]	Had a serious health condition due to a disease diagnosis or accident that required hospitalization, long-term medical treatment, or surgical treatment
	Animal Attack[a]	Attacked by an animal that caused an injury
	Accident Witness[a]	Experienced or witnessed an accident, such as vehicle accident
Family	Emotional Abuse[b]	Swearing, insulting, putting down someone, acting in a way that made a child fear of physical harm
	Physical Abuse[b]	Pushing, grabbing, slapping, throwing an object, hitting to cause injury
	Sexual Abuse[b]	Touching and fondling a child in a sexual way, attempting to have sexual intercourse
	Emotional Neglect[b]	Failing to help a child feeling special and loved, have family look out for each other and feel close, and as a source of support
	Physical Neglect[b]	Not having enough to eat; parents were highly intoxicated to care for a child; wearing dirty clothes
	Domestic Violence (Mother) [b]	Mother was pushed, grabbed, slapped, kicked, hit with a fist, repeatedly hit for at least a few minutes, or threatened or hurt by a weapon by father or mother's boyfriend
	Household Substance Abuse[b]	Had a family member who was alcoholic, or street drugs
	Mental Illness in Household[b]	Had a family member who was depressed, mentally ill, or attempted suicide
	Parental Separation or Divorce[b]	Have parents who ever got divorced or separated
	Criminal Household Member[b]	Lived with a household member who was sent to a prison
	Childhood Poverty[c]	Hard to get by on family's income—hard to cover basics like food or housing
Community/Society	Community Violence/Crime[a,d,e]	Witnessed or victimized due to organized violent crime, police action, war/terrorism, mugging, kidnapping, or shooting
	Natural Disasters[a]	Had experiences with severe natural disasters, such as hurricane and earthquake

	Bullying/Cyberbullying[f]	Victimized by aggressive behaviors in person or involving technologies that have the intension of harming others
	Violence Exposure via Media[a]	Exposure to violent contents via media platforms
	Endemic/Pandemic[g]	Experienced a wide spread of an infectious disease that requires systematic preventive measures and major lifestyle changes, such as social distancing, limited access to medical services, and school closures
Culture	Discrimination[c]	Treated or judged unfairly because of race or ethnicity
	Excessive Pressure to Succeed[h]	Constantly felt under pressure to succeed and outperform others for personal achievements in academics, sports, and other extracurricular activities

Note. [a] Choi et al. (2019); [b] NASEM (2019); [c] CAHMI (2018); [d] Shin et al. (2018); [e] Koita et al. (2018); [f] Finkelhor (2020); [g] new types that could be added to ACEs; [h] Luthar et al. (2020).

Figure 1. Revised Adverse Childhood Experiences (ACEs) Questionnaires



CHAPTER 5

CONCLUSION AND FUTURE DIRECTIONS FOR PRACTICE AND POLICY ON CHILDHOOD ADVERSITY AND RESILIENCE

In summary, research studies in Chapters 2 and 3 sought to gain knowledge on childhood adversity and protective factors for youth and parents that ameliorate the relationship between adversity and adjustment problems. In the population-based study using the 2016 National Survey of Children's Health data (see Chapter 2), Adverse Childhood Experiences (ACEs) were linked with internalizing and externalizing problems among children aged 6 to 18 years old. However, parents' aggravation related to parenting had a stronger relation with children's adjustment problems, and personal support and external resources for parenting moderated such relationships. Chapter 3 was on youth in High Achieving Schools (HASs)—a newly identified at-risk group due to high pressure to succeed. The study revealed the effects of having at least one caring adult at school on adolescents' intrinsic motivations for self and community. Last, Chapter 4 focused on the current conceptual and methodological limitations in ACEs research. The concept should expand to cover a variety of adversities that influence children's healthy development. Also, when studying ACEs, researchers should not only focus on individuals but also parents' wellbeing because parents are primary caregivers. Based on the findings from previous studies in this dissertation, this chapter will discuss implications for practice and policy in helping children and families.

Implications for Practice

The most important protective factors that are consistently reported in the previous literature concern main caregivers or parents including parental harshness or anger (Ebbert et al., 2018; Goodman & Garber, 2017a; Luthar & Eisenberg, 2017). A number of interventions have been designed to target individual-level components of

positive adjustment, when in fact developing children are greatly influenced by familial indices. It is a well-established fact that, the younger the individual is, the more he or she relies on the main caregiver to meet physical and emotional needs that are essential for development. Therefore, it is imperative to address the importance of parents' health and wellbeing (Luthar & Ciciolla, 2015; Masten & Barnes, 2018) in the development of interventions and policies that target children's positive development. As Chapter 2 discussed, when parents are distressed due to parenting, negative emotions and behavior can be projected to the children, contributing to maladjustment (Suh & Luthar, 2020).

Therefore, future interventions should support parents' emotional health to ensure that parents have an adequate support system through reliable sources. A study conducted with mothers in medical professions showed notable improvements in their emotional health when consistent support was provided through peer support group sessions (Luthar et al., 2017). The significant improvements in psychological indices (such as, 'feel loved', 'personal accomplishment', and 'parenting stress') lasted not only after the intervention but also at the 3-month follow-up. Consistent with these findings, the presence of family support significantly interacted with parental aggravation, attenuating the link between aggravation and children's maladjustment (i.e., perseverance and emotional regulation) and maladjustment indicators (i.e., internalizing and externalizing problems; Suh & Luthar, 2020).

In practice settings, healthcare professionals can achieve these goals via regular screenings for parents' emotional and physical well-being, as well as the presence of constant support systems for parenting (Jones et al., 2020; NASEM, 2019; Suh & Luthar, 2020). Based on the screening results, practitioners can make referrals to appropriate resources or programs (e.g., Healthy Families America and Nurse Family Partnership which provides routine home visits and assessments about home environments; Jones et

al., 2020). Similarly, interventions that are designed to enhance communication and parenting style are shown to help parents to form supportive family environments (Khanlou & Wray, 2014).

In addition, the formative roles of nonparental adults are important in promoting child resilience when main caregivers or parents are unable to provide stable care for their children. Resilience of children is associated with close relationships with people—including teachers, peers, and neighbors (Southwick & Charney, 2012). Resilience at broader socioecological levels (e.g., community) should be considered because an individual is an integral part of the family and community (Walsh, 2006). Walsh further noted that, in household dysfunctions, all members in the individual's network of relationships are directly and/or indirectly affected. Peer support programs, for example, can provide the opportunities for children to develop meaningful relationships and emotional security, especially among those with severe distress or disabilities in which additional support can be greatly beneficial (Carter et al., 2016).

The meaning of resilience goes beyond the absence of disease or one's subjective feeling of happiness. Altruism—which concerns with 'making contributions to a society' (Little, 2011; Luthar et al., 2015) is an important area to explore when it comes to adaptation outcomes. As discussed in Chapter 3, spiritual and social aspects of health are closely related to prosocial behavior. It is thus necessary to consider adjustment indicators that are beyond the absence of physical and psychological problems, which include the dimensions that can foster positive growth of children, such as prosocial behavior.

Finally, several ethical considerations should be noted. Previous research in risk and resilience show statistical associations to identify the harmful/beneficial impacts of factors in children's growth environments (Masten, 2018). However, these findings

should not be used to determine who have responsibilities for maltreatment, and also build stereotypes against individuals who have been dealing with traumatic childhood histories. Public education on childhood adversity should be aimed to reduce negative connotations or overgeneralization of scientific findings.

Implications for Policy

Early preventative intervention is crucial particularly during the developmentally sensitive periods where harmful effects of maltreatment are more likely to occur and last throughout the course of life. A majority of existing health policies, however, are based on the disease-oriented approach in which the main focus is to target relevant symptoms, without incorporating multiple socioeconomic levels and contextual factors (Wong et al., 2015). Thus, research on childhood trauma and adversity has not properly addressed root-causes of ACE and takes a reactive approach rather than a proactive approach. The utilization of a resilience-oriented approach in policy making—through collaboration in multidisciplinary teams—may benefit the population as a whole, by addressing key determinants of positive adaptation.

Several policy initiatives in the following areas can be beneficial: 1) early screenings for 'assets and strengths' in children and families at well-child visits—more so in the communities with high ACE rates (Bonanno & Diminich, 2013); 2) public education to advance the understanding about the effect of trauma; 3) increased reimbursements for healthcare professionals when they provide screenings and appropriate follow-up care; 4) increased tax credits, such as the Earned Income Tax Credit and Child Tax Credit, and childcare subsidies to decrease financial burdens of child care; 5) affordable, high-quality childcare (CDC, 2019); 6) increased access to care to shape resilience in communities where childhood adversity is prevalent (Ungar, 2016); and finally, 7) educational requirements on childhood adversity and resilience

across various healthcare-related disciplines—such as educators, healthcare professionals, and social workers—to educate them about the implications of ACEs and resilience, as well as care coordination with proper resources available. As for the fifth approach, most practitioners—who have direct contact with people in the communities—will benefit from learning valuable scientific findings in practical application—which can be done by workshops, short courses, and pragmatic assistance (Theron, 2017).

Last, local non-profit organizations, like Child Crisis Arizona (https://childcrisisaz.org), have been providing family-oriented programs to reduce adverse outcomes of childhood trauma. Noting that high ACE prevalence is found within ethnic minorities (Topitzes et al., 2013)—primarily Latino/Hispanic or single-parent households—existing trauma-informed interventions at local organizations should expand to become a part of community-based primary care. This can be achieved by collective effort of community health clinics, educational institutions, and local organizations to promote family resilience and well-being.

Conclusion

In conclusion, a growing body of literature supports dose-response relationships with ACEs and a range of health problems and early mortality. This dissertation highlights that children's resilient adaptation is closely related to 1) parents' emotional wellbeing and support for parenting, as well as 2) the presence of caring relationships with adults outside family. These findings suggest potential areas to develop in future research, practice, and policy to help children and families with high risks of ACEs and subsequent health problems. Of note, in order to advance future interventions and policies to reduce ACEs and foster resilience, ongoing efforts to overcome conceptual and methodological limitations are necessary. Meantime, interdisciplinary collaborations in

various sectors are inevitable to maximize positive outcomes of ACEs prevention interventions and strengthen families and communities.

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APPENDIX A

CORRELATION TABLES

Table 1a. Correlation Coefficients, Separately by Gender

School B	1	2	3	4	5	6	7	8	9	10
1. Withdrawn/Depressed	1	0.81**	0.24**	0.36**	-0.27**	-0.13*	-0.42**	-0.02	-0.05	-0.01
2. Rule-Breaking	0.63**	1	0.20**	0.50**	-0.20**	-0.17**	-0.30**	-0.13*	-0.04	-0.15*
3. Time Pressure	0.12*	0.07	1	0.18**	-0.20**	-0.10	-0.17**	0.05	0.18**	0.10
4. Peer Victimization	0.51**	0.53**	0.14*	1	-0.23**	-0.16**	-0.17**	-0.11	-0.12	-0.20**
5. School Caring Adult	-0.25**	-0.16**	-0.15**	-0.29**	1	0.36**	0.31**	0.19**	0.12*	0.20**
6. School Diversity	-0.04	-0.06	-0.03	-0.06	0.27**	1	0.23**	0.15*	0.13*	0.16**
7. Attachment with Parents	-0.35**	-0.31**	-0.05	-0.32**	0.25**	0.12*	1	0.05	0.10	0.09
8. AIR-Community	-0.12*	-0.11	0.16**	-0.13*	0.26**	0.18**	0.23**	1	0.37**	0.59**
9. AIR-Relationships	-0.15*	-0.09	0.20**	-0.11	0.21**	0.13*	0.10	0.48**	1	0.55**
10. AIR-Personal Growth	-0.11	-0.14*	0.24**	-0.08	0.21**	0.20**	0.21**	0.61**	0.70**	1

Note. Boys' correlations are reported below and girls' correlations are reported above the diagonal; ^$p < 0.10$; *$p < 0.05$; **$p < 0.01$.

Table 1b. Correlation Coefficients, Separately by Gender

SCHOOL A	1	2	3	4	5	6	7	8	9	10
1. Withdrawn/Depressed	1	0.37**	0.16**	0.33**	-0.35**	-0.23**	-0.42**	-0.17**	-0.32**	-0.05
2. Rule-Breaking	0.43**	1	0.08	0.39**	-0.21**	-0.20**	-0.31**	-0.24**	-0.13*	-0.02
3. Time Pressure	0.09	0.06	1	0.17**	-0.10	-0.04	-0.12*	0.14*	0.07	0.07
4. Peer Victimization	0.43**	0.42**	0.22**	1	-0.28**	-0.12*	-0.25**	-0.21**	-0.08	-0.07
5. School Caring Adult	-0.28**	-0.36**	0.01	-0.15*	1	0.35**	0.42**	0.26**	0.21**	0.25**
6. School Diversity	-0.02	-0.09	0.01	0.05	0.33**	1	0.29**	0.20**	0.09	0.16*
7. Attachment with Parents	-0.39**	-0.25**	-0.01	-0.19**	0.24**	0.12*	1	0.13*	0.23**	0.17**
8. AIR-Community	-0.18**	-0.24**	0.08	0.02	0.31**	0.13*	0.19**	1	0.30**	0.53**
9. AIR-Relationships	-0.20**	-0.18**	0.25**	0.02	0.21**	0.13*	0.14*	0.45**	1	0.31**
10. AIR-Personal Growth	-0.18**	-0.20**	0.15**	-0.09	0.33**	0.14*	0.21**	0.55**	0.68**	1

Note. Boys' correlations are reported below and girls' correlations are reported above the diagonal; ^$p < 0.10$; *$p < 0.05$; **$p < 0.01$.

Table 1c. Correlation Coefficients, Separately by Gender

School C	1	2	3	4	5	6	7	8	9	10
1. Withdrawn/Depressed	1	0.33**	0.25**	0.28**	-0.21**	-0.17**	-0.33**	-0.11*	-0.09	-0.03
2. Rule-Breaking	0.49**	1	0.14*	0.51**	-0.16**	-0.17**	-0.30**	-0.11	0.04	0.04
3. Time Pressure	0.20**	0.20**	1	0.20**	-0.02	0.00	-0.09	0.09	0.09	0.11*
4. Peer Victimization	0.47**	0.60**	0.21**	1	-0.18**	-0.08	-0.24**	-0.01	0.07	0.06
5. School Caring Adult	-0.08	-0.05	-0.09	-0.05	1	0.43**	0.22**	0.30**	0.30**	0.30**
6. School Diversity	-0.02	-0.08	-0.03	-0.12*	0.36**	1	0.11*	0.24**	0.31**	0.29**
7. Attachment with Parents	-0.40**	-0.34**	-0.21**	-0.26**	0.30**	0.15**	1	0.12*	0.13*	0.17**
8. AIR-Community	-0.14**	0.15**	0.05	-0.08	0.24**	0.09	0.28**	1	0.40**	0.61**
9. AIR-Relationships	-0.11*	-0.02	0.10*	-0.07	0.16**	0.14*	0.31**	0.49**	1	0.67**
10. AIR-Personal Growth	-0.08	-0.05	0.02	-0.13*	0.19**	0.12*	0.23**	0.59**	0.66**	1

Note. Boys' correlations are reported below and girls' correlations are reported above the diagonal; ^$p < 0.10$; *$p < 0.05$; **$p < 0.01$.