Fostering Youth Resilience Through

Intrapersonal Skills in the

Presence of Adverse Childhood Events

by

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A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science

Approved April 2021 by the
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May 2022

ABSTRACT

Although adverse events cannot always be prevented, the negative outcomes on development can potentially be modified by considering methods of fostering positive emotional and behavioral responses. The study examined biopsychosocial health outcomes in the presence of uncontrollable adverse childhood events with the goal of identifying a potential intervention to increase resilience, health, and safe behaviors among at-risk children. It was hypothesized that adverse events can result in positive biopsychosocial outcomes in the presence of high scores on the Positive Emotion, Engagement, Relationships, Meaning, and Accomplishments (PERMA) model of well-being, self-efficacy, gratitude, and the ability to envision a positive future self. The study retrospectively examined adverse childhood events and present behavioral, emotional, and physical health outcomes. Participant (n = 685) data were analyzed using Hayes PROCESS (v3.5) to test all components of the moderation model. Results suggest that as adverse events increase, health adversity also increases. However, those with high intrapersonal strengths showed better health outcomes. Through understanding intrapersonal pathways in the presence of adverse events the study can potentially identify mechanisms important for promoting resilient outcomes in childhood that could cascade into adulthood.

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INTRODUCTION

Childhood is a critical developmental stage; consequently, positive and negative experiences during childhood influence health outcomes and future behavior throughout the lifespan (for a review, see Hughes, Bellis, Hardcastle, & Sethi, 2017). Child development into adolescence is cumulative in nature and is comprised of many facets, which sets the foundation for lifelong learning, behavior, and health. Early experiences in childhood shape the brain and the child's capacity to learn (Couperus & Nelson, 2006), to get along with others (Blair, 2002), and to respond to daily stresses and challenges (Posner & Rothbart, 2006; Shanker, 2010). Most notably, some of the most influential aspects on development are external and environmental factors (Bronfenbrenner, 1979).

Many environmental factors and experiences that occur during childhood are often out of a child's control. Adverse childhood events (ACEs; e.g., emotional, physical, and sexual abuse; neglect or maltreatment; childhood household dysfunction; Chapman, Dube, & Anda, 2007) and the resulting toxic stress can lead to later impairments in learning, behavior, and both physical and mental well-being (Shonkoff & Garner, 2012). Many biopsychosocial models (i.e., an interdisciplinary framework which accounts for the relationship between biological, psychological, and socio-environmental influences on health and disease (Engel, 1977), have been proposed to explain the relationship between negative stressful life events and health outcomes (Bolton & Gillett, 2019). However, many of these models neglect to address possible positive emotional and/or behavioral responses to adversity (e.g., a stress growth mindset; Dweck, 1990).

Although ACEs cannot always be prevented, the negative outcomes on development can potentially be modified by considering methods of fostering positive

emotional and behavioral responses. Identifying and understanding protective factors are equally as important to designing effective interventions as researching risk factors (SAMHSA, 2019). Thus, the proposed thesis will examine a resilience model of childhood adversity on future outcomes. Protective factors for children facing adversity cover a broad spectrum, including having a supportive family environment and social network; concrete support for basic needs; nurturing parenting skills; stable family relationships; household rules and child monitoring; parental employment and education; adequate housing; access to health care and social services; as well as caring adults outside the family who can serve as role models or mentors (CDC, 2020).

Similar to adverse events, the vast majority of these protective factors tend to be external and environmental. Thus, it is critical to identify *intrapersonal* skills within the child that can protect them in the face of adversity, as these skills can be strengthened, whereas environmental factors tend to be out of the child's control. One specific intrapersonal resilience skill is the ability to envision a positive future. By envisioning a positive future-self, a child will likely experience hope, motivation, and long-term decision-making skills (Dweck, 1990). Gratitude may also act as a resilience skill to promote self-improvement and positive change (Armenta, Fritz, Lyubomirsky, 2017). A strong sense of self-efficacy establishes belief in oneself and capabilities (Bandura, 1977). An additional intrapersonal framework that is relatively unexplored within the ACEs literature is Seligman's (2011) PERMA model of well-being. This study aims to examine these intrapersonal skills in the presence of adverse childhood events, with the goal of identifying a potential intervention to increase resilience, health, and safe behaviors among at-risk children.

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REVIEW OF LITERATURE

Adverse Childhood Events & Health Impacts

Adverse childhood events (ACEs) are potentially traumatic experiences that may result in immense stress and can consist of abuse, neglect, or household dysfunction, or (Felitti, Anda, Nordenberg, Williamson, Spitz, et al., 1998). The ten factors of ACEs include physical, emotional, and sexual abuse; physical and emotional neglect; witnessing domestic violence; having a family member affected by mental illness, substance abuse, or incarceration; and losing a parent to separation or divorce. The first ACEs survey was conducted in the late 1990s by the Kaiser Permanente San Diego Health Appraisal Clinic. Participants More than half of the 13,494 respondents had at least one ACE, and 25% reported more than one category of ACEs. In the most recent survey by the National Survey of Children's Health (NSCH, 2018), over 30 million children in the United States (41.9%) are estimated to have experienced at least one or more types of serious childhood adverse events.

There is strong evidence for a relationship between health risk behaviors and disease in adulthood and exposure to traumatic events that occurred during childhood (Felitti, Anda, Nordenburg, et al., 1998). ACE study findings show a graded dose-response relationship between adverse childhood experiences and negative health and well-being outcomes. In other words, as the number of ACEs increases, so does the risk for negative outcomes (CDC, 2018). For example, those who experienced four or more adverse childhood events were twelve times more likely to experience health risks for alcoholism, drug abuse, depression, and suicide attempt and showed a two- to four-fold increase in smoking, poor self-rated health, and sexually transmitted diseases.

Biomolecular and physiological studies continue to demonstrate how exposure to chronic stress in childhood results in changes in the development of endocrine, nervous and immune systems, leading to impairments in cognitive, emotional, and social functioning and heightened allostatic load (i.e., chronic physiological damage) (Danese, & McEwen, 2012; Pechtel, & Pizzagalli, 2011).

A recent review found that childhood adversity was associated with cardiovascular disease (myocardial infarction, stroke, ischemic heart disease, coronary heart disease) in almost every published study (91.7%; 22 of 24) (Basu, McLaughlin, Misra, & Kohen, 2017). Several studies report an association between ACEs and increased risk of hypertension and blood pressure (Jimenez, Roberts, & Loucks, 2015; Suglia, Sapra, & Koenen, 2014). Another meta-analysis of longitudinal studies showed a positive association between childhood adversity and obesity (Elsenburg, van Wijk, Liefbroer, & Smidt, 2017). ACE exposure has been related to a 32% increased risk for Type 2 diabetes (Huffhines, Noser, & Patton, 2016). Further, harsh physical punishment during childhood has been associated with increased odds of cardiovascular problems, arthritis, and obesity; more severe physical abuse, sexual abuse, witnessing intimate partner violence, and/or neglect was reported to be associated with hypertension, hepatic disease, diabetes, cardiovascular disease, gastrointestinal disease, arthritis, and obesity (Afifi, MacMillan, Boyle, Cheung, Taillieu, Turner, & Sareen, 2016). Additionally, adverse childhood experiences predict behaviors that increase the risk of cancer in adulthood (Mouton, Hargreaves, Liu, Fadeyi, & Blot, 2016). More recently, research has shown individuals who experience six or ACEs are placed at risk of death nearly twenty years prematurely from diseases commonly diagnosed in the primary care setting

compared to those without exposure to ACEs (Bryan, 2018). More striking, research suggests exposure to ACEs contributes to seven out of ten of the leading causes of death in the United States, including ischemic heart disease, cancer, stroke, chronic obstructive pulmonary disease, diabetes, and suicide (CDC, 2018). Not surprisingly, the magnitude and impact of childhood adverse events have often been referred to as "the single greatest unaddressed public health threat facing our nation today" (Kalmakis & Chandler, 2015, p. 457).

Aside from physical health implications, adverse childhood events also have an impact on behavioral and mental health, including future violence perpetration, high-risk sexual behaviors, alcohol abuse, drug use, smoking, drinking, as well as physical inactivity and poor diet (Campbell, Walker, & Egede, 2016; Duke, Pettingell, McMorris, & Borowsky, 2010). Additional related behavioral outcomes include negative impacts on education such as increased likelihood for dropping out of school, a negative impact on employment including decreased earning potentials, increased risk in crime and violence, adult homelessness, and more difficulty forming stable relationships (Herman, Susser, Struening, & Link, 2011; Morrow & Villodas, 2017).

Poor mental health outcomes include a dose-response relationship between the number of ACEs and the likelihood of depression and suicide; a patient who experiences six or more ACEs is 24 times more likely to attempt suicide than an individual with an ACE score of zero (Merrick, Ports, Ford, Afifi, et al., 2017). Additionally, the risk for depression nearly triples with ACEs exposure, and the risk for drug and alcohol use dramatically increases (Cheong, Sinnott, Dahly, & Kearny, 2017).

Whereas psychological research often suffers from a lack of generalizability and inability to infer causality, these associations have been reported in both cross-sectional and longitudinal designs, and with older adults and ethnically diverse samples (Maschi, Baer, Morrissey, & Moreno, 2013; Merskya, Topitzesb, & Reynolds, 2013). This expansive literature highlights the unfortunate commonality and salience of ACEs – in other words, ACE exposure can be viewed as a developmental disorder that begins early in life (Shonkoff, Garner, Fa, Depe, & Pediat, 2012). Thus, a lifespan perspective is critical when examining the impact of childhood trauma (Afifi, Mota, MacMillan, & Sareen, 2013). It is essential to not only prevent the negative health consequences of childhood adverse experiences, but also to promote a buffering process to help protect children in these disadvantaged circumstances (Sege & Linkenbach, 2014; Shonkoff & Garner, 2012). Yet, we know substantially less about protective factors and resilience within the ACE literature.

Stress & Resilience

Stress is a demand that exceeds the adaptive capacity of an organism, resulting in psychological and biological changes that may place individuals at risk for disease (Cohen, Kessler, & Underwood Gordon, 1995). One way of understanding the impact from stressful or adverse events is through the biopsychosocial lens. George Engel (1977) suggested that we must consider "the patient, the social context in which he lives, and the complementary system devised by society to deal with the disruptive effects of illness" (p. 132). This unifying model of stress addresses biopsychosocial elements of stress and health by assessing environmental demands, appraisal, perceived stress, negative emotional response, and a physiological or behavioral response that results in an

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increased risk of physical/psychiatric disease and dangerous risky behavior. Less prevalent in the psychological literature is a focus on possible positive emotional responses to stress.

Stressful events can result in growth, resilience, and motivation to cope and/or alter a negative circumstance (Park, & Helgeson, 2006). Resilience is a dynamic concept to describe a positive psychological outcome, even in the presence of serious risk and stressful life experiences (Rutter, 2006). Many definitions of resilience have been used within the literature (Masten, 2014; Sabina & Banyard, 2015; Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). For example, resilience can be understood as a process of adaptation, with an individual experiencing positive physical or mental health after adversity (Masten, 2014), or maintaining mental health through periods of exposure to stress (Southwick et al., 2014). Resiliency can also be understood as a protective mechanism that diminishes maladaptive outcomes under conditions of risk (Greenberg, 2006). For purposes of this study, resilience will be defined as the achievement of positive outcomes despite challenging or threatening circumstances (Brooks, 2006; Masten, 2001; Masten et al., 1991), coping successfully with traumatic experiences, and avoiding negative paths linked with risks (Garmezy et al., 1984; Luthar et al., 2000; Werner, 1992).

Resilience can function at either (or both) the individual or social network level. Researchers often investigate resilience in terms of its correlates, including protective factors, or external resources (Banyard, Hamby, Grych, 2016). Psychological factors associated with resilience in the face of physical illness consist of self-efficacy, self-esteem, internal locus of control, optimism, mastery, hardiness, hope, self-empowerment,

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acceptance of illness, and determination (see Stewart & Yuen, 2018, for a review). Additionally, social support and coping strategies (e.g., positive cognitive appraisal, spirituality, active coping, and mastery) are highly predictive of resilience (Stewart & Yuen, 2011). There is also an expansive body of literature connecting resilience and mental health status with positive social outcomes across the lifespan (see Khanlou, & Wray, 2014, for a review). On the other hand, a lack of resilience has been associated with outcomes such as unsafe sex, poor educational performance and completion, bullying, crime, unemployment, low job productivity, and the likelihood of poverty (Keyes 2004; Pressman & Cohen, 2005; Scott et al., 2001; Sylva et al., 2007; Windle, 2000).

ACEs and Resilience

Resilient children are those who succeed in the face of adversity, who possess strengths and benefit from protective factors that aid in their ability to overcome adverse conditions and thrive (Zolkoski, & Bullock, 2012). Although adverse childhood events cannot always be avoided, resilience factors can potentially buffer uncontrollable negative events. Resilience outcomes in the presence of adverse childhood experiences result from a variety of protective factors impacting physical, behavioral, and mental health. Prior research has shown that the quality of a child's relationships, environmental factors (e.g., safe neighborhoods and quality schools), and individual traits in temperament and cognitive ability all temper the deleterious consequences when experiencing adverse events (Greenberg, 2006).

A review by Afifi and MacMillan (2011) described factors related to resilience across the ecological model (including the individual, interpersonal, organizational, and

community level). Specifically, they emphasized the importance of self-esteem, easy temperament, and interpersonal relationships (especially those within the family unit). A review focused more specifically on child sexual abuse created a long list of protective factors, including optimism and hope, coping skills and sense of control, and community social support (Marriott, Hamilton-Giachritsis, & Harrop, 2014). Banyard and colleagues (2016) found that individuals with greater childhood victimization did have poorer physical health, but those with strength in emotion regulation, meaning-making in life, community support, social support, and practicing forgiveness reported better health. Furthermore, strengths across "resilience portfolio domains" (i.e., regulatory, meaning-making, and interpersonal) had independent, positive associations with health-related quality of life after accounting for participants' exposure to adversity. Yet, much remains to be understood about resilience in the context of adverse childhood experiences as most research is cross-sectional or short-term longitudinal and lacks a multidimensional approach that is critical for understanding developmental domains. (Cicchetti, 2013). Further, across studies, only 10% - 25% of maltreated children achieve resilient functioning (Walsh, Dawson, & Mattingly, 2010). Thus, it is imperative to investigate multi-level methods of resilience to be able to increase the health and overall well-being of children who have faced adversities.

PERMA Model

One multi-dimensional model that may help build an understanding of resilience in children facing adverse events is the PERMA model. PERMA is a multi-dimensional approach to capturing well-being. Well-being involves both hedonic and eudaemonic well-being (i.e., happiness from experiences of enjoyment and meaning; Adler &

Seligman, 2016). This construct goes beyond positive emotions and integrates thriving across multiple domains of life (Diener, Scollon, & Lucas, 2003). Seligman's Five Pillars of Well-Being (2011) consist of positive emotions, engagement, relationships, meaning, and accomplishments. *Positive emotions* can be understood as hedonic feelings of happiness and optimism in life. *Engagement* consists of commitment, fulfillment, and immersion in activities or organizations. Positive *relationships* involve feeling satisfied with social connections and support. *Meaning* can be understood as believing one's life matters and as being part of something greater than oneself. Finally, *accomplishments* include making advancements towards goals, feeling capable to achieve those goals, and a sense of achievement.

This model has been shown to predict flourishing. To flourish in life is to feel good and function effectively, both of which combine to result in high levels of well-being (Seligman, 2002). Flourishing is thriving even in adversity; in other words, it is not simply the presence or lack of mental health problems, but the strengths an individual possesses. In the literature, it is common for positive constructs to be studied independently despite being highly correlated with one another (Friedman & Kern, 2014). However, only with a multidimensional well-being metric can we recognize strengths and weaknesses within groups of people (Kern, Waters, Adler, & White, 2015), which is critical to identify within groups facing ACEs.

Limited research has been conducted utilizing the PERMA model in adolescents within an educational setting. Within the few studies, there is consistent evidence that student well-being is multidimensional in regard to the positive and negative sides of mental health. Coffey, Wray-Lake, Mashek, and Branand (2016) sought to validate the

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higher-order factor structure of the PERMA model, as well as its concurrent and predictive validity with respect to flourishing. Results for both a community-based and college student sample showed that the indicators of PERMA predicted flourishing over time. Yet, ambiguity remains with how this relationship functions in the presence of adverse childhood events and in relation to behavioral, physical, and emotional health outcomes.

Prevention and intervention efforts for child adversity should form a greater focus on creating a portfolio of strengths. Under the lens of PERMA, child development strengths include skills in emotion regulation (positive emotion), meaning-making (meaning), practicing forgiveness (positive emotion), and social support at the community and friend levels (relationships) (Banyard, Hamby, & Grych, 2016). Meaning-making practices may help individuals reframe adversities in ways that reduce stress and decrease pressure on emotion regulation systems. Research conducted by Lenzi et al. (2015) on school victimization among high school students reported that the number of assets (including self-efficacy, social support, positive family relationships, optimism, emotional regulation) an individual reported predicted greater protection against victimization. Taken together, these results suggest the need for future studies to examine more than one protective factor at a time. Thus, the primary aim of the thesis is to examine the role of the PERMA model of well-being in the association between ACEs and health/behavioral outcomes (*Aim 1*).

Envisioning Future-Self

One way of predicting emotional and behavioral outcomes is through the ability to envision a positive future-self. There is evidence that thought-action tendencies from

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positive emotions transform into habitual ways to play, explore, savor, integrate, or envision future achievement (Fredrickson, 2011). Those who tend to view both their life and future with confidence also expect positive outcomes and reframe adverse events into learning moments, which increases positive emotions and well-being (Schreiner, 2018).

According to the identity-based motivation model (Oyserman, 2009), behavioral decisions are made in alignment with either personal or social identities; which are shaped by one's present environment (i.e., an individual may identify as a student when in a classroom and a sibling while at home). Perceptions of the self over time can dramatically affect decision-making. Specifically, when the future-self possesses similarities with the present self and when viewed in vivid, positive, and realistic terms, individuals are more likely to make decisions in the present that may improve their future even years ahead of where they are currently (future self-continuity model; Hershfield, 2011).

Envisioning a future-self has been shown to improve long-term decision making and delayed reward. Hershfield and colleagues (2011) successfully applied this model to show long-term decision-making skills leading to an adult sample exercising more. Those with more present-future continuity reported better subjective health across a variety of measures, suggesting that future self-continuity promotes adaptive long-term health behavior. Conversely, research has found that the inability to think through the delayed consequences of behavior is one of the strongest individual-level correlates of delinquency (Gelder, Hershfield, & Nordgren, 2013).

Although maintaining a positive future self-perception results in benefits for overcoming adversities, this construct remains unexplored within the ACEs literature.

Adverse childhood events may impact and even distort a child's vision of their future. Those who are still able to envision a positive future-self may have better health outcomes than those who do not view their future-self with realism, vividness, and in positive terms. Thus, the second aim of the thesis is to examine whether the ability to envision a future-self moderate the association between ACEs, PERMA, and health/behavioral outcomes (*Aim 2*).

Self-Efficacy

An additional mechanism that may help reduce the negative impact of adverse event exposure is self-efficacy (Maddi, 2008), a well-established variable within the resilience literature. Bandura (1977) defined general self-efficacy as an individual's belief regarding personal effectiveness to successfully execute a required behavior. Self-efficacy expectations reflect our beliefs that we can bring about desired changes through our own efforts. Efficacy expectations affect the length and amount of effort individuals will put forth in the presence of aversive events (Bandura, 1977). Especially in the face of adversity, individual differences in perceived self-efficacy are superior predictors of performance when compared to previous achievement or ability (Cassidy, 2015). Further, research has shown that self-efficacy can influence the choice of activities, effort, persistence, and achievement (Schunk, 1995). For instance, as self-efficacy beliefs increase the more persistent individuals will be in achieving goals (Schunk, 1995).

However, minimal research has examined how self-efficacy corresponds with resilient behaviors in response to childhood adversity. One study conducted by Hamill (2003) found that self-efficacy and the ability to articulate coping responses are significant personality characteristics that predict more resilient outcomes in adolescents.

Additionally, self-efficacy and emotional stability were found to buffer the effects of ACEs on mental and physical health (Cohrdes, & Mauz, 2020). I also argue that self-efficacy can help buffer the association between ACEs and health. Thus, the third aim of the thesis is to investigate whether self-efficacy moderates the association between ACEs and health outcomes (*Aim 3*).

Gratitude

Evidence indicates that positive emotions and, specifically, gratitude, may also encourage individuals to perform positive behaviors such as self-improvement (Armenta, Fritz, & Lyubomirsky, 2017). Gratitude is defined as a state of acknowledging the achievement of a positive outcome and that the positive outcome came from an external source (Emmons & McCullough, 2003). Similarly, to other positive emotions, gratitude broadens one's cognition and behavior and helps build individual psychological and social resources (Fredrickson, 2004). Research suggests gratitude results in increased feelings of connectedness and greater perceived social support (Wood, Maltby, Gillett, Linley, & Joseph, 2008), less stress (Wood et al., 2008), and fewer depressive symptoms (Lambert, Fincham, & Stillman, 2012). Gratitude has also been found to be motivating and energizing (Emmons & Mishra, 2011) by energizing individuals' efforts towards growth in important life domains, including health, work, and relationships (Armenta, Fritz, Lyubomirsky, 2017) and motivating goal achievement (Emmons & Mishra, 2011).

In relation to adolescents increased gratitude has demonstrated increased academic performance, engagement in extracurricular, grade point average, and desire to contribute to society (Froh, Bono, & Emmons, 2010; Ma, Kibler, & Sly, 2013). Armenta and colleagues (2017) reported expressing gratitude acts as a motivator of self-

improvement through connectedness, elevation, humility, and negative states including indebtedness. The expression of gratitude aids in the belief of deserving positive outcomes and the ability to achieve them (Lambert, Graham, Fincham, & Stillman, 2009). Therefore, the fourth aim of the thesis is to investigate whether gratitude moderates the association between ACEs and health outcomes (*Aim 4*).

HYPOTHESES

The present study investigated the mechanisms through which adverse childhood events may have ramifications for behavioral, emotional, and physical health outcomes into adulthood, with a focus on the ability to envision a positive future-self, gratitude, PERMA, and self-efficacy as moderators. It is proposed that health outcomes in relation to adverse childhood events can be moderated by unique intrapersonal pathways (future-self, gratitude, PERMA, and self-efficacy) (see Figure 1). The present study aims to show the relationship between adverse childhood events and various health outcomes and investigate the intrapersonal moderating role of future-self, gratitude, PERMA, and self-efficacy. To examine these aims, survey data captured prior exposure to adverse childhood events, present health status, and current intrapersonal and interpersonal variables.

Based on prior literature and theory, the following hypotheses were proposed.

H1: High ACEs scores will be related to poor behavioral, emotional, and physical health outcomes.

H2: PERMA scores will buffer the relationship between ACEs and behavioral, emotional, and physical health outcomes, such that higher PERMA scores will predict a weakened relation between ACEs and behavioral, emotional, and physical health outcomes.

H3: The ability to envision a positive future-self will buffer the relationship between ACEs and behavioral health outcomes, such that those who envision a positive future-self will experience more positive behavioral health outcomes in the presence of adverse events.

H4: High sense of self-efficacy will buffer the relationship between ACEs and

behavioral, emotional, and physical health outcomes.

H5: An overall feeling of gratitude in one's life will buffer the relationship

between ACEs and behavioral and emotional health outcomes.

Figure 1

Moderation Model of Intrapersonal Factors Between Adverse Childhood Events and

Health Outcomes
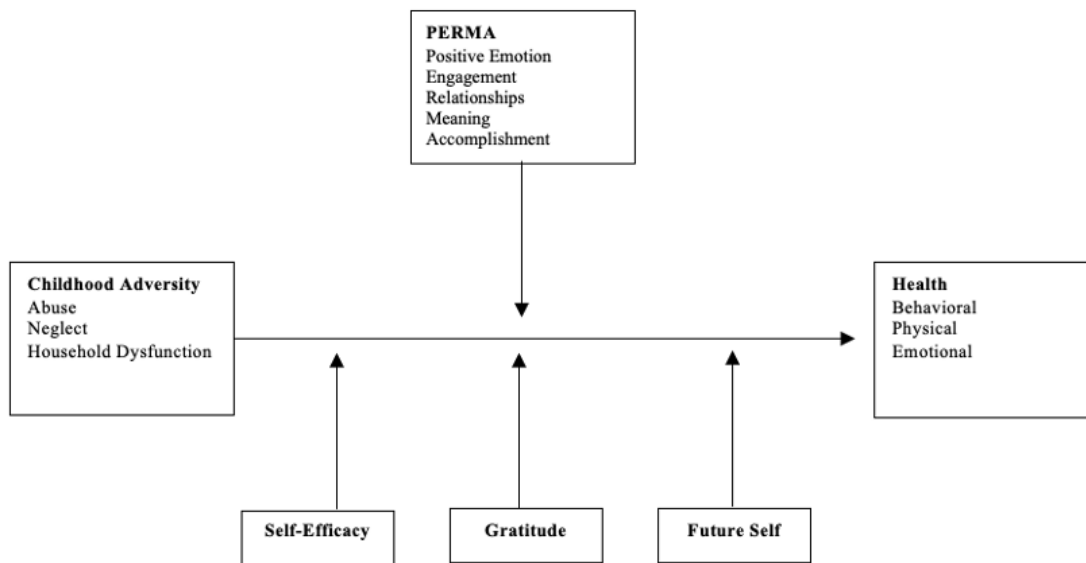
METHOD

Participants

An a priori power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2008), with an estimated effect size of (f^2) of .02, an alpha of .05, power of .80, and four tested predictors, indicated that a total sample of 602 would be needed to detect a large effect size ($d = 0.80$). A nationally representative sample of 685 adults was recruited from Amazon Mechanical Turk (Mturk) ($n = 517$); additionally, I recruited college students through Arizona State University's SONA student research participation system ($n = 168$) between November 21, 2020, and December 18, 2020. Participants were recruited through Mturk to capture a more diverse sample than undergraduate students (Buhrmester et al., 2011); further, Mturk workers are more likely to be unemployed than the general population (Goodman, Cryder, & Cheema, 2013). Unemployment may act as a negative behavioral outcome whereas attending college may indicate a positive behavioral outcome. The variation in life experiences was predicted to show meaningful differences between undergraduate students and adults throughout the United States regarding resilience outcomes.

Procedure

The cross-sectional study design measured prior exposure to ACEs and current outcomes from adversities or lack of adversities simultaneously. After obtaining informed consent, participants completed a 15-minute online questionnaire. Following participation in the survey, participants were provided with a link to online resources for ACEs prevention and for strategies to cope with stress. Mturk participants were compensated (approximately $1.25) for their time and Arizona State University

participants were granted a research participation credit. Participants ($n = 11$) who missed

more than two out of three attention checks were excluded from analyses. After

participant exclusion, the total sample size was 674 (48.4% women, 51.3% men, 0.3%

non-binary). The sample was largely homogenous in terms of most demographic

characteristics: participants were on average 35 years of age, mostly White (60.9 of

participants), college-educated (61.7% of participants had completed a college degree;

29.1% had completed some college), participants were either married or cohabitating

(59.6%), and lower- to middle-income (42.6% of households making between $40,000

and $80,000). See Table 1 for sample characteristics and Table 2 for bivariate

correlations among all study variables.

Table 1

Complete Participant Demographics

	Full Sample ($N = 674$)		SONA ($n = 167$)		Mturk ($n = 507$)	
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*
Age	34.62	(12.69)	22.93	(5.14)	38.47	(12.07)
Gender (%)						
Male	51.2		26.9		59.4	
Female	48.2		71.9		40.6	
Non-Binary	0.3		1.2			
Race (%)						
White	60.9		41.6		67.2	
Hispanic	15.6		19.3		14.4	
African-American	8.6		8.4		8.7	
Asian	7.9		9.0		7.5	
American Indian or Alaska Native	2.1		6.0		0.8	
Native Hawaiian or Pacific Islander	0.4		1.8			
Other	4.5		13.9		1.4	

Education (%)			
Some high school	0.6	1.8	0.2
High school/GED	8.6	13.2	7.1
Some College	29.1	65.3	17.1
College	43.4	18.6	51.6
Advanced Degree	18.3	1.2	24.0
Employment Status (%)			
Full-Time	63.2	14.4	79.1
Part-Time	10.7	9.0	11.3
Student	18.8	66.5	3.0
Retired	1.6		2.2
Unemployed	5.7	10.2	4.2
Household Total Income (%)			
Less than $20,000	12.2	26.5	7.5
$20,001 to $40,000	20.8	23.5	19.9
$40,001 to $60,000	24.8	17.5	27.2
$60,001 to $80,000	17.8	12.0	19.7
$80,001 to $100,000	13.7	10.2	14.8
$100,001 to $120,000	4.3	2.4	4.9
More than $120,000	6.4	7.8	5.9
Region (%)			
Northwest	12.4	4.8	15.0
Southeast	19.6	5.4	24.5
Midwest	13.6	7.2	15.8
Southwest	26.7	68.7	12.3
West	27.7	13.9	32.4
Relationship Status (%)			
Married	50.5	11.4	63.3
Cohabitating	9.1	13.8	7.5
Divorced/Separated	5.3	3.6	5.9
Widowed	0.3		0.4
Single/Never Married	34.8	71.3	22.7
Romantic Relationship (%)			
Yes	71.6	55.1	77.2
No	28.4	44.9	22.8
Own Home (%)			
Yes	52.0	15.0	64.3
No	34.4	41.9	31.9
Other Arrangement	13.7	43.1	3.8

Table 2

Bivariate Correlations Among All Study Variables

	1	2	3	4	5	6	7	8	9
1. ACE									
2. PERMA	-.13**								
3. Future-Self	-.11**	.65**							
4. Self-Efficacy	-.29**	.35**	.37**						
5. Gratitude	-.21**	.53**	.37**	.50**					
6. Behavioral Health	-.57**	.18**	.21**	.45**	.27**				
7. Emotional Health	-.29**	.53**	.33**	.53**	.49**	.31**			
8. General Health	-.24**	.37**	.34**	.47**	.34**	.27**	.47**		
9. Sona vs Mturk	.08	.12**	.06	-.20**	-.22**	-.14**	.11**	-.03	
10. Income	-0.03	.04	.09	.04	.04	.02	.12**	.08*	.15**
11. Age	.11**	.12**	.13**	-.04	-.06	-.03	.16**	-.05	.55**
12. Region	.20**	-.09*	-.09*	-.08*	-.03	-.15**	-.13**	-.08*	-.19**
13. Gender	-.01	-.07	-.07	.08*	.11**	.14**	-.02	-.04	-.29**
14. Race	.04	-.07	-.06	.02	.05	.02	-.05	-.00	-.30**
15. Relationship Status	-.27**	-.18**	-.15**	.18**	.12**	.21**	-.01	.10**	-.46**
16. Romantic Relationship	-.17**	-.17**	-.13**	.07	.02	.15**	-.01	.07	-.21**
17. Education	.18**	.10**	.09*	-.19**	-.15**	-.16**	.02	-0.02	.43**
18. Own vs Rent	-.17**	-.13**	-.08*	.16**	.18**	.15**	-.06	.07	-.54**
19. Employment	-.13**	-.15**	-.06	.11**	.16**	.16**	-.13**	-.03	-.53**

Note. p < .05*, p < .01**

Table 2 (continued)

	10	11	12	13	14	15	16	17	18	19
11. Age	.16**									
12. Region	-.02	-.03								
13. Gender	-.15**	-.09*	-.02							
14. Race	-.01	-.25**	.08	-.02						
15. Relationship Status	-.18**	-.43**	.07	.14**	.19**					
16. Romantic Relationship	-.14**	-.17**	.03	.05	.11**	.62**				
17. Education	.27**	.30**	-.02	-.20**	-.08*	-.37**	-.22**			
18. Own vs Rent	-.28**	-.46**	.00	.20**	.23**	.53**	.33**	-.34**		
19. Employment	-.20**	-.28**	.00	.22**	.20**	.33**	.20**	-.35**	.44**	

Note. $p < .05$*, $p < .01$**

Measures

Sociodemographics. Demographic characteristics believed to be related to one or more of the major study variables were assessed, including age, gender, race/ethnicity, education, employment status, household income, region, relationship status, romantic relationship involvement, and homeownership. *Age* range in this sample was from 18 to 73 years and was represented as both a continuous variable and as a categorical variable (18-24, 25-34, 35-44, 45-54, 55-64, 65 or more). *Race/ethnicity* was a self-report of White, African American, Hispanic, Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, or other. *Education* consisted of five categories: some high school, high school, some college, college, or an advanced degree. *Employment status* was categorized as full-time, part-time, student, retired, or currently unemployed (i.e.,

homemaker, disabled, etc.). *Household Income* represented total family income at the time of the study and was categorized as less than $20,000, $20,001 - $40,000, $40,001 - $60,000, $60,001 - $80,000, $80,001 - $100,000, $100,001 - $120,000, or more than $120,000. *Region* was categorized as Northwest, Southeast, Midwest, Southwest, and West. *Relationship status* consisted of married, cohabiting, divorced/separated, widowed, single/never married. *Romantic relationship* was a self-report of yes or no. *Own a home* consisted of yes, no, other arrangement.

Adverse Childhood Events. Adverse childhood events were assessed using the Kaiser Permanente Adverse Childhood Experiences Survey (Felitti et al., 1998), which captures the ten most common ACEs experienced in the first 18 years of life including emotional, physical, and sexual abuse; emotional and physical neglect; household dysfunction, includes battered mother, parental discord/divorce, mental illness in the household, household substance abuse, and incarcerated household member. Sample items include "*there was someone in my family who helped me feel important or special*," and "*I didn't have enough to eat*." Response options consist of 1 = *yes* and 2 = *no*. A sum score was created with higher scores indicating greater adverse childhood events (M = 3.25, SD = 3.18). For post hoc analyses, a categorical value was created for no adverse childhood experiences (27.8%) versus one or more adverse childhood experiences (72.2%).

PERMA Multidimensional Well-being. PERMA was measured using the PERMA profiler questionnaire (Butler & Kern, 2016). The measure consists of three questions for each of the five PERMA domains (positive emotion, engagement, relationships, meaning, accomplishment) for a total of 15 questions to assess well-

23

being. Sample items include, "*How often do you feel positive*?" and "*To what extent do you lead a purposeful and meaningful life*?" Response options range from 1 = *not at all to* 7 = *completely* and 1 = *never to* 7 = *always*. A mean score was created with higher scores indicating greater well-being (*M* = 5.04, *SD* = 1.13). The scale demonstrated high internal consistency (α = .95).

Negative Emotions. In addition, three items were included that captured negative emotions: "*How often do you feel angry, how often do you feel anxious,* and *how often do you feel sad?*" Response options ranged from 1 = *never to* 7 = *always.* A single item asked, "*How often do you feel lonely in your daily life*?" Response items range 1 = *never to* 7 = *always.* A single item asked, "*Taking all things together, how happy would you say you are*?" Response items range 1 = *extremely happy to* 7 = *extremely unhappy.* A mean score was created with higher scores indicating greater negative emotions (*M* = 3.57, *SD* = 1.56). The scale demonstrated high internal consistency (α = .85).

Future-Self. The ability to envision a positive future-self was assessed using items from the Future Self-Continuity Scale (Hershfield, 2011; Ersner-Hershfield et al., 2009). This measure consists of seven items assessing similarity, vividness, and positivity of one's future-self. Participants were first asked to close their eyes for five seconds and imagine their future-self ten years from now.

Similarity and connection between current and future selves were assessed by two questions on a 7-point scale marked at each point by two circles that range from depicting no overlap to depicting almost complete overlap (Hershfield, 2011). Participants selected the circle pair that best described how similar and how connected they feel to a future-self ten years from now (Figure 2). Participants rated how much they care about and like

their future selves ten years from now on 7-point Likert scales with responses ranging from 1 = *don't care at all* to 7 = *completely care*; 1 = *do not like at all* to 7 = *completely like*. To assess how vividly participants imagine their future, two survey items asked, "*How easy is it for you to visualize a mental picture of your future?*" and "*When I imagine my future, it is very vivid, and I have a clear image in my head*" on a 7- point Likert scale with responses ranging from 1 = *very difficult* to 7 = *very easy*; 1 = *strongly disagree* to 7 = *strongly agree*. To assess how positively participants imagine their future, one item, "*My future feels positive and bright*" was measured on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agre*e. A mean score was created with higher scores indicating greater future self-continuity ($M = 5.04$, $SD = 0.96$). The scale demonstrated adequate internal consistency ($\alpha = .76$).

Figure 2

Future Self-Continuity Similarity Measure
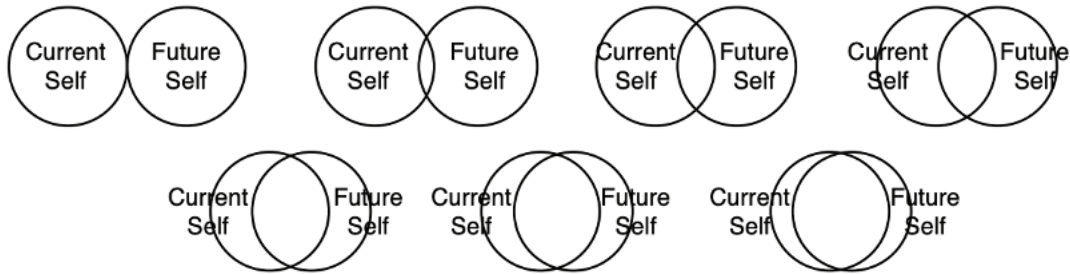
Self-Efficacy. Self-efficacy was assessed with the General Self-Efficacy Scale (Sherer et al., 1982). The scale consists of 12 items that are scored on a 4-point scale (1 = *not at all true*, 2 = *hardly true*, 3 = *moderately true*, 4 = *exactly true*). Sample items include, "*If something looks too complicated, I will not even bother to try it*" and "*I feel insecure about my ability to do things*." Seven items were reverse-coded in the direction

of high self-efficacy. A mean score was created with higher scores indicating a greater sense of self-efficacy ($M = 2.92$, $SD = 0.61$). The scale demonstrated adequate internal consistency ($\alpha = .86$).

Gratitude. Gratitude was assessed with the 6-item Gratitude Scale (e.g., "Lately I notice I have much in life to be grateful for"; McCullough et al., 2002). Responses ranged from 1 = *strongly disagree* to 7 = *strongly agree*. A mean score of the six items was created with higher scores indicating greater gratitude ($M = 5.03$, $SD = 1.15$). The scale demonstrated adequate internal consistency ($\alpha = .78$).

Health Measures

Emotional and Physical Health. The Medical Outcomes Study 36-Item Short-Form Health Survey (Ware & Sherbourne, 1992) assessed eight health concepts: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions. All items were scored so that a high score reflects more favorable health state. In addition, each item was scored on a 0 to 100 range so that the lowest and highest possible scores are 0 and 100, respectively. Scores represent the percentage of total possible score achieved. Items in the same scale were averaged to create eight scale scores. Items left blank (missing data) were not considered when calculating scale scores. The scale scores represent the average for all items in the scale that the respondent answered. See Table 3 for number of scale items and reliability level.

Table 3

Medical Outcomes Study 36-Item Short-Form Health Survey Reliability

Scale	Items	Alpha	Mean	SD
Physical functioning	10	.95	70.49	30.67
Role functioning/physical	4	.83	74.65	49.23
Role functioning/emotional	3	.60	64.08	47.01
Energy/fatigue	4	.65	50.27	19.93
Emotional well-being	5	.79	60.58	20.86
Social functioning	2	.76	64.72	27.07
Pain	2	.86	68.48	27.09
General health	5	.76	64.49	20.17
Health change	1	—	62.87	24.44

Behavioral Health. Behavioral health was assessed with nine items from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS; 1984). The original BRFSS captures 45 health-related risk behaviors, chronic health conditions, and use of preventive services. For the current study, the following nine behaviors were assessed for frequency in the past year: a) smoking frequency (1 = *everyday*, 2 = somedays, 3 = never); b) alcohol consumption (1 = *less than 1 day per week*, 2 = *1 day per week*, 3 = *2 days per week*, 4 = *3 or more days per week*, 5 = *no drinks in the past 30 days*); c) amount of physical activity (1 = *I did not*, 2 = *less than once per week*, 3 = *once per week*, 4 = *twice per week*, 5 = 3 or more times per week)*;* d) fruit consumption (1 = I did not, 2 = less than once per week, 3 = *once per week*, 4 = *twice per week*, 5 = *3 or more times per week*); e) vegetable consumption (1 = *I*

did not, 2 = *less than once per week*, 3 = *once per week*, 4 = twice per week, 5 = 3 or

more times per week); f) routine check-up from a doctor (1 = within the past year, 2 = *2*

years ago, 3 = *3 or more years ago*); g) average amount of sleep per night (1 = *5 hours or*

less, 2 = *6 hours*, 3 = *7 hours*, 4 = *8 hours*, 5 = *9 hours or more);* h) ever been

homelessness (1 = *yes*, 2 = *no*); i) risky sexual behavior and illegal drug usage (Do any of

these situations apply to you: You have injected any drug other than those prescribed for

you in the past year; been treated for a sexually transmitted disease or STD in the past

year; given or received money or drugs in exchange for sex in the past year; you had sex

without protection (condom, birth control, etc.); had four or more sex partners in the past

year (1= *yes*, 2 = *no*, 3 = *do not know/unsure*). All items were scored so that a high score

reflects a more favorable behavioral health state. In addition, each item was scored on a 0

to 100 range so that the lowest and highest possible scores are 0 and 100. However, for

the risky sexual behavior and/or drug use item, 14 participants selected *do not*

know/unsure. These participants were coded as missing for this item, as they could not be

assigned a behavioral health state code from 0 to 100. A mean score of the nine items was

created with higher scores indicating better behavioral health (*M* = 66.84, *SD* =

18.26). The items demonstrated lower internal consistency (α = .65).

      For post-hoc analyses, three separate behavioral health domains were created by

calculating a mean score for high-risk behaviors (risky sexual behavior/drug usage and

homelessness; *M* = 70.15, *SD* = 37.14), moderate risk behaviors (smoking and alcohol

consumption; *M* = 65.91, *SD* = 31.09) and life-style behaviors (fruit, vegetable, sleep,

physical activity, doctor visit; *M* = 65.94, *SD* = 18.08).

RESULTS

Hayes PROCESS v3.5 (Model 1) bootstrapping procedure (with 5,000 bias corrected samples) was utilized to investigate whether the relation between number of adverse childhood events and behavioral, emotional, and physical health outcomes in adulthood varied as a function of PERMA, future-self, self-efficacy, and gratitude. The standardized sum score for adverse childhood events was entered as the focal predictor and each of the four moderators (standardized PERMA, future-self, self-efficacy, and gratitude scores) were entered separately into models predicting of behavioral health (mean score), emotional health (emotional well-being domain; SF-36), and physical health (general health domain; SF-36). The other three moderators were entered as covariates in each respective analysis. A linear regression was performed to determine which demographic covariates would be used in the analyses. Age, region, relationship status, and income were significant covariates for behavioral health. Region, employment status, and income were significant covariates for emotional well-being. Region and income were significant covariates for general health. Additionally, a missing data analysis conducted in SPSS revealed that 2.8% or less data were missing for any single assessed measure.

Behavioral Health

The first set of analyses examined whether the association between adverse childhood events and behavioral health is buffered by PERMA, the ability to envision a positive future-self, self-efficacy, and/or gratitude. Two significant interactions were found (controlling for age, region, relationship status, income, and the respective other moderators). A significant ACEs x Self-Efficacy interaction was found, $b = 1.71$, $SE =$

0.30, $t(624) = 5.62$, $p < .0001$, $\Delta R^2 = .03$. The decomposition of the interaction revealed

that all three simple slopes were significant ($p < .0001$), such that more childhood

adversity was related to worse behavioral health outcomes. Moreover, in partial support

of my hypothesis, those with relatively higher levels of self-efficacy (1 SD above the

mean) showed the smallest slope ($b = -1.34$, $SE = 0.30$, $t(624) = -4.48$, $p < .0001$),

whereas those with relatively lower self-efficacy (1 SD below the mean) had the steepest

slope ($b = -3.41$, $SE = 0.23$, $t(624) = -14.92$, $p < .0001$). In other words, a stronger

relationship exists between the number of adverse childhood events and poorer

behavioral health outcomes for those with lower levels of self-efficacy. A visualization of

this interaction is presented in Figure 3.

Figure 3

Number of Adverse Childhood Events and Self-Efficacy as Predictors of Behavioral

Health
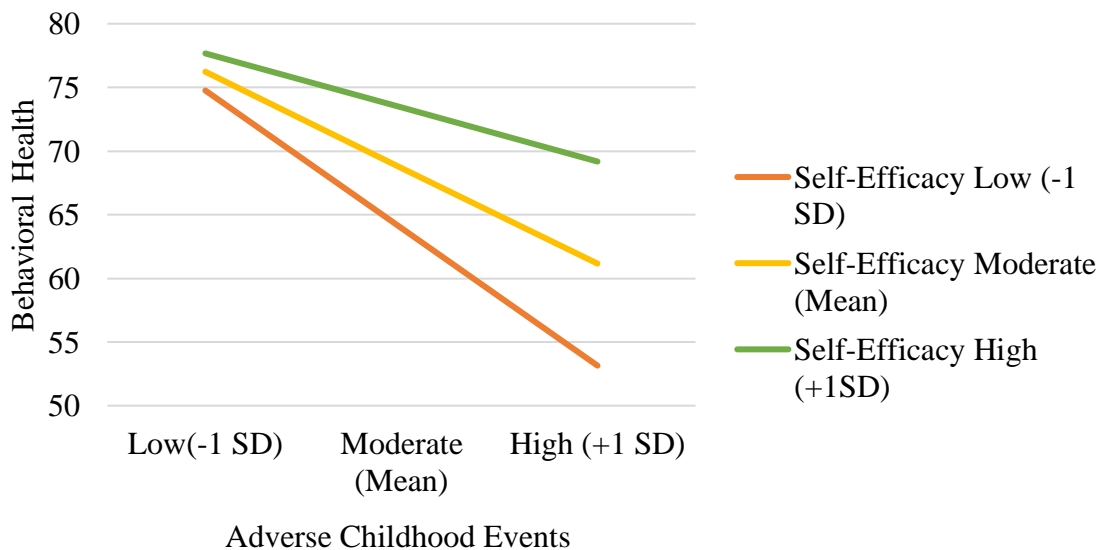
A similar significant interaction was found with gratitude, $b = 0.47$, $SE = 0.18$,

$t(624) = 2.60$, $p < .01$, $\Delta R^2 = .006$. Decomposition of the interaction revealed that all three

simple slopes were significant ($p < .0001$), such that more childhood adversity was related to worse behavioral health outcomes. Moreover, in partial support of my hypothesis, those with relatively higher levels of gratitude (+1 SD) showed the smallest slope ($b = -2.03$, $SE = 0.30$, $t(624) = -6.70$, $p < .0001$) whereas those with the relatively lower gratitude (-1 SD) had the steepest slope ($b = -3.11$, $SE = 0.26$, $t(624) = -12.04$, $p < .0001$). In other words, a stronger relationship exists between number of adverse childhood events and poorer behavioral health outcomes for those with lower levels of gratitude. A visualization of this interaction is presented in Figure 4.

Figure 4

Number of Adverse Childhood Events and Gratitude as Predictors of Behavioral Health
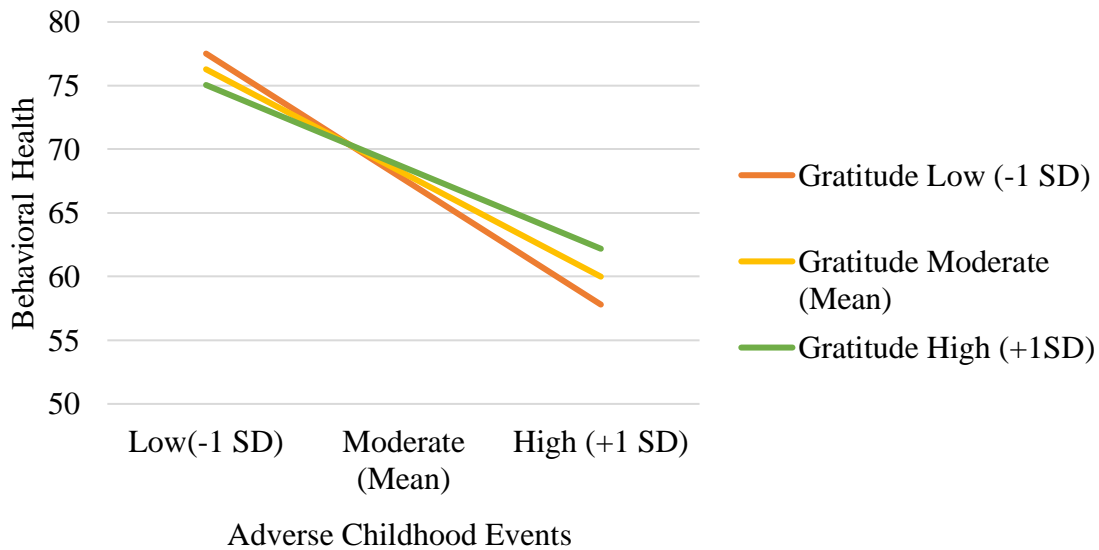
Finally, no significant interactions were found for PERMA as a single index ($b = -0.11$, $SE = 0.16$, $t(624) = 0.66$, $p = .51$, $\Delta R^2 = .0004$) or future-self ($b = -0.03$, $SE = 0.18$, $t(624) = -0.18$, $p = .86$, $\Delta R^2 = .0000$).

Emotional Health

The next set of analyses examined whether the association between adverse childhood events and emotional health is buffered by PERMA, the ability to envision a positive future-self, self-efficacy, and/or gratitude. One significant interaction and two marginally significant interactions were found (controlling for region, employment status, income, and the respective other moderators).

A significant ACEs x PERMA interaction was found, $b = -0.51$, $SE = 0.18$, $t(623) = -2.92$, $p < .01$, $\Delta R^2 = .007$. Decomposition of the interaction revealed that the simple slopes at moderate (mean) and high (+1 SD) levels of PERMA were significant ($p < .0001$), such that more childhood adversity was related to worse emotional health outcomes. Those with the relatively higher PERMA scores (+1 SD) showed the steepest slope ($b = -1.60$, $SE = 0.28$, $t(623) = -5.64$, $p < .0001$), whereas those with moderate PERMA scores (mean) had a smaller slope ($b = -1.03$, $SE = 0.20$, $t(623) = -5.19$, $p < .0001$). In other words, a stronger relationship exists between number of adverse childhood events and poorer emotional health outcomes for those with higher levels of PERMA. However, those with higher levels of PERMA reported on average higher levels of emotional health. A visualization of this interaction is presented in Figure 5.

Figure 5

Number of Adverse Childhood Events and PERMA as Predictors of Emotional Health
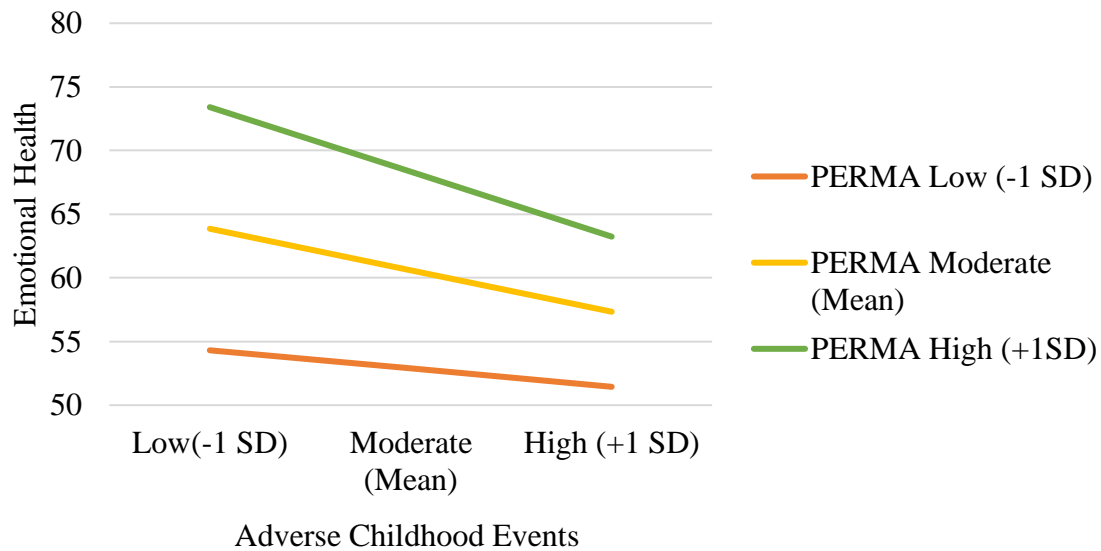
Additionally, a marginally significant ACE x Future-Self interaction was found, *b* = -0.03, *SE* = 0.19, *t*(623) = -1.90, *p* = .057, Δ*R*² = .003. Decomposition of the interaction revealed that all simple slopes were significant. However, contrary to my hypothesis, those with relatively higher values for future-self (+1 SD) had the steepest slope (*b* = -1.34, *SE* = 0.28, *t*(623) = -4.95, *p* < .0001), whereas those with relatively lower future-self values (-1 SD) had a smallest slope (*b* = -0.69, *SE* = 0.26, *t*(623) = -2.64, *p* < .01). In other words, a stronger relationship exists between number of adverse childhood events and poorer emotional health outcomes for those with highest levels of future-self.

A marginally significant gratitude interaction was also found, *b* = -0.35, *SE* = 0.20, *t*(623) = -1.79, *p* = .07, Δ*R*² = .003. Decomposition of the interaction revealed that all three simple slopes were significant. Those with relatively higher levels of gratitude (+1 SD) showed the steepest slope (*b* = -1.47, *SE* = 0.33, *t*(623) = -4.50, *p* < .0001) whereas those with relatively lower levels of gratitude (-1 SD) had the smallest

slope (b = -0.66, SE = 0.28, $t(623)$ = -2.39, $p < .05$). In other words, a stronger relationship exists between number of adverse childhood events and poor emotional health outcomes for those with highest levels of gratitude. Finally, a significant interaction was not found for self-efficacy, b = -0.53, SE = 0.34, $t(623)$ = -1.55, p = .12, ΔR^2 = .002.

Physical Health

The last set of analyses examined whether the association between adverse childhood events and physical health is buffered by PERMA, a positive future-self, self-efficacy, and/or gratitude. Two significant interactions and one marginally significant interaction were found (controlling for region, income, and the respective other moderators).

A significant ACEs x PERMA interaction was found, b = -0.67, SE = 0.20, $t(627)$ = -3.27, $p < .01$, ΔR^2 = .01. Decomposition of the interaction revealed that the simple slopes at moderate and high levels of PERMA were significant. Those with relatively higher levels of PERMA (+1 SD) showed the steepest slope (b = -1.45, SE = 0.33, $t(627)$ = -4.38, $p < .0001$), whereas those with moderate levels of PERMA (mean) had a smaller slope (b = -0.71, SE = 0.23, $t(627)$ = -3.08, $p < .001$). In other words, a stronger relationship exists between number of adverse childhood events and poorer physical health outcomes for those with higher levels of PERMA. However, those with higher levels of PERMA reported on average slightly higher levels of physical health. This interaction is presented in Figure 6.

Figure 6

Number of Adverse Childhood Events and PERMA as Predictors of Physical Health
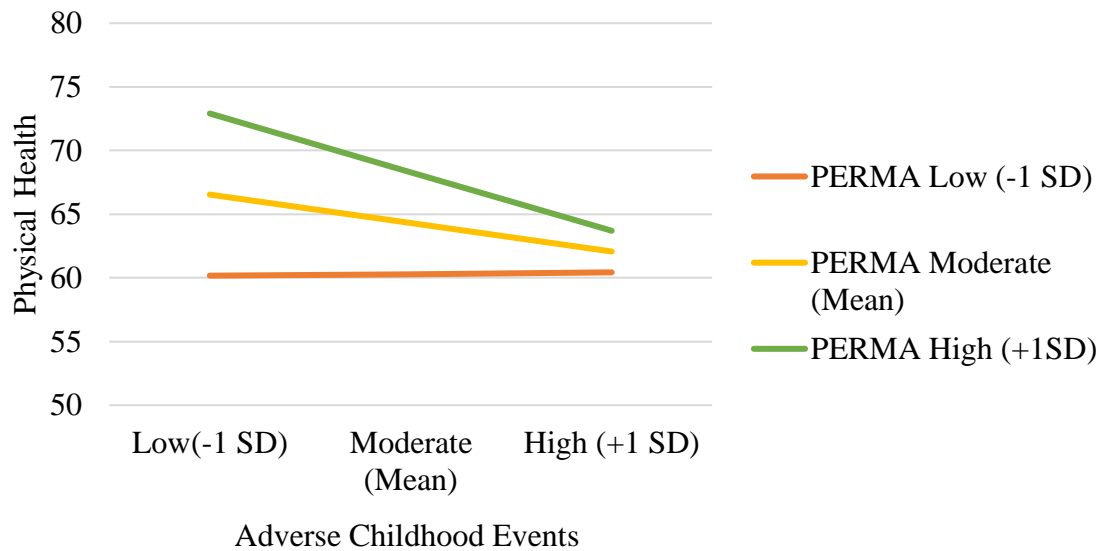
A similar significant interaction was found with self-efficacy, $b = -0.90$, $SE = 0.39$, $t(627) = -2.29$, $p < .05$, $\Delta R^2 = .006$. Decomposition of the interaction revealed that simple slopes were significant at moderate and high levels of self-efficacy. Those with relatively higher levels of self-efficacy ($+1$ SD) showed the steepest slope ($b = -1.36$, $SE = 0.38$, $t(627) = -3.57$, $p < .001$), whereas those with moderate self-efficacy (mean) had a smaller slope ($b = -0.82$, $SE = 0.24$, $t(627) = -3.41$, $p < .001$). In other words, a stronger relationship exists between number of adverse childhood events and poorer physical health outcomes for those with higher levels of self-efficacy. However, those with higher levels of self-efficacy reported on average higher levels of physical health. A visualization of this interaction is presented in Figure 7.

Figure 7

Number of Adverse Childhood Events and Self-Efficacy as Predictors of Physical Health
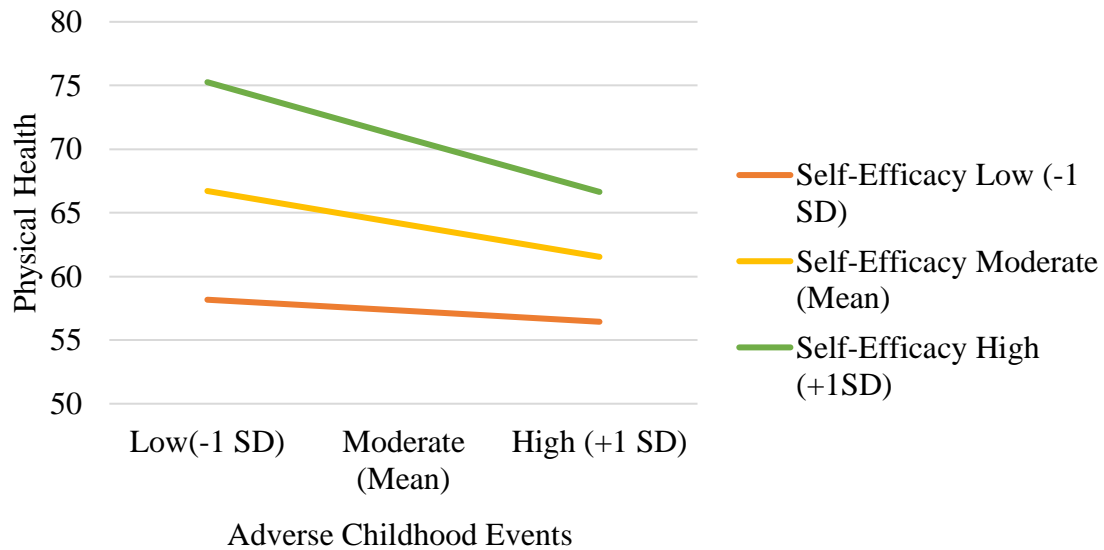
A marginally significant future-self interaction was found, $b = -0.42$, $SE = 0.22$, $t(627) = -1.88$, $p = .06$, $\Delta R^2 = .004$. Decomposition of the interaction revealed that simple slopes were significant at moderate and high levels of future-self, such that more childhood adversity was related to worse physical health outcomes. Those with relatively higher levels of future-self (+1 SD) showed the steepest slope ($b = -1.10$, $SE = 0.33$, $t(627) = -3.37$, $p < .0001$) whereas those with moderate levels of future-self (mean) had a smaller slope ($b = -0.70$, $SE = 0.23$, $t(627) = -3.04$, $p < .001$). Finally, a significant interaction was not found for gratitude, $b = -0.30$, $SE = 0.23$, $t(627) = -1.32$, $p = .19$, $\Delta R^2 = .002$.

DISCUSSION

Although adverse childhood events cannot always be prevented it is critical to identify resilience pathways to help mitigate the negative outcomes that often transcend into adulthood. It is not only important to identify overall resilience pathways, but which specific intrapersonal traits can be strengthened to improve behavioral, emotional, and physical health outcomes. Within a nationally representative sample, I found that several resilience factors moderated the association between childhood adversity and adult health outcomes (see Figure 8 for an overall summary of those interactions).

Figure 8

Moderation of Intrapersonal Factors between Adverse Childhood Events and Behavioral, Emotional and Physical Health
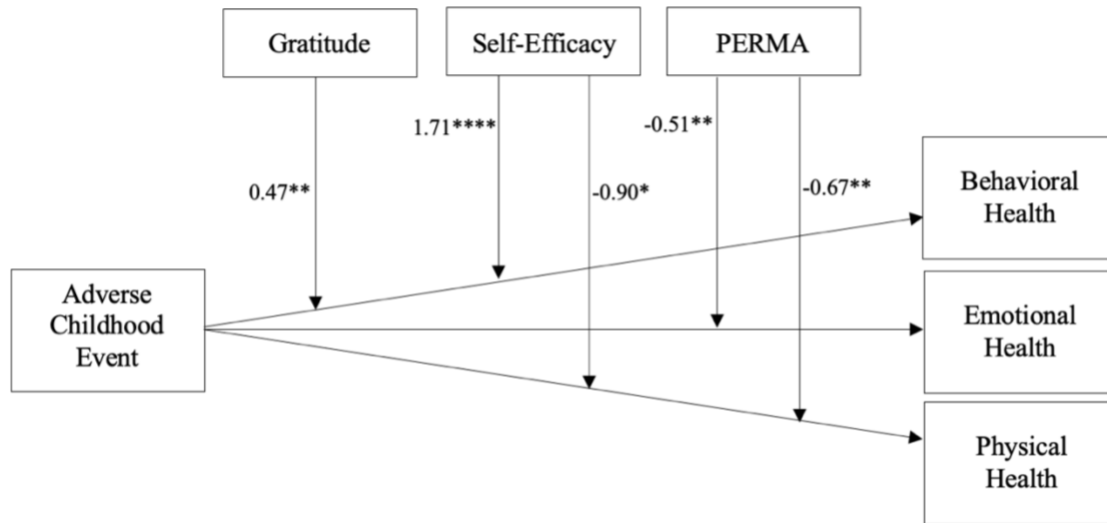
Behavioral Health: Gratitude and Self-Efficacy

Results support prior research showing that adverse childhood events are related to poor behavioral, emotional, and physical health outcomes in adulthood. Furthermore, as predicted, gratitude and self-efficacy played a significant role in buffering the negative

impacts from adverse childhood events on behavioral health outcomes. Those who had relatively higher levels of self-efficacy and gratitude showed the weakest relation between ACEs and negative behavioral health outcomes. Gratitude and self-efficacy are similar as they both relate to self-improvement and Frederickson's (2011) broaden and build theory. This theory states that certain discrete positive emotions—including joy, interest, contentment, pride, and love—although phenomenologically distinct, all share the ability to broaden people's momentary thought-action repertoires and build physical, intellectual, social, and psychological resources. Thus, when positive emotions occur in adverse circumstances, they broaden people's momentary thought action range in terms of building enduring personal resources.

Future studies should investigate gratitude competency, as there is more to gratitude than simply experiencing high levels; rather, one needs to experience appropriate gratitude (Armenta, Fritz, & Lyubomirsky, 2017). Appropriate gratitude refers to expressing gratitude when it is beneficial for both the individual and situation. Negative states may be triggered by the expression of gratitude including feelings of indebtedness and guilt. Individuals who express insincere gratitude (Watkins, 2014) or depressed individuals (Sin, Della Porta, & Lyubomirsky, 2011) may actually experience decreased overall well-being.

Emotional and Physical Health: PERMA and Self-Efficacy

Although self-efficacy and PERMA significantly moderated the relationship between ACEs and emotional and physical health, they did so in an unpredicted way. Specifically, those with the highest levels of levels of PERMA showed the steepest slopes for both emotional and physical health outcomes. In other words, those with the highest

PERMA scores showed the strongest relation between ACEs and poorer emotional and physical health. For those individuals with relatively higher overall well-being, there was a stronger association between ACEs and negative emotional and physical health. Although the predicted buffering effect did not emerge, participants with relatively higher PERMA scores did have health scores that were higher than those for participants with lower and moderate PERMA scores. This pattern also held for self-efficacy. Although the results did not reveal a traditional resilience (or buffering) effect, participants with relatively higher self-efficacy did report better emotional and physical health than participants with moderate and relatively lower levels of self-efficacy.

PERMA and self-efficacy findings did not suggest a buffering effect, given that the relation between number of ACEs and poorer emotional and physical health was stronger, but that there was evidence that those higher in resilience and self-efficacy had higher levels of well-being, nonetheless. These findings suggest that individuals with higher resilience and self-efficacy start from a better level of emotional and physical health, which provides more of a "buffer" against the strong negative effect of ACEs on health outcomes.

Future research should investigate a larger range of intrapersonal skills to determine which traits would best buffer the negative impacts of ACEs. Further, in order to achieve a true resilient outcome, it is likely that there is not going to be one single variable but a combination of skills and resources that allows children to thrive in the face of adversity. Specifically, the Resilience Portfolio Model highlights the importance of poly-strengths, which explains there is no distinct quality, resource, or asset that leads to resilient outcomes, rather it may be the aggregate of assets that bolsters improved

functioning after adversity (Banyard, Hamby, & Grynch, 2017). Lastly, to be most effective in promoting resilience, the type of adverse childhood event experienced, or the combination of those events needs to be taken into consideration.

Future-Self

Finally, of all the resilience factors tested, envisioning a future self only marginally moderated the relationship between ACEs and emotional and physical health outcomes. Contrary to my prediction, those with the greatest ability to envision a future self showed a marginally steeper slope for ACE's and emotional and physical health than those with low or moderate ability to envision a future self. For a visualization of the interactions see Figure 9 and Figure 10 located in Appendix A. Although envisioning a positive future-self is unexplored with the ACEs literature. Envisioning a positive future-self is similar to one of the well-established Positive Psychology Interventions - the "Best Possible Self" intervention - which asks participants to write about the best version of themselves in a future where they have achieved everything desired after working hard towards it (Mitchell et al. 2010; Sin & Lyubomirsky, 2009). The goal of the intervention is to increase well-being, which has been thought to stem from the role of temporality and thinking ahead. However, a recent study by Carrillo, Etchemendy, and Banos (2020) aimed to investigate if this sense of best possible self and temporality was essential for increasing well-being. They reported that they were unable to distinguish any large difference in a best possible self as past, present, future, or control interventions. They concluded that prompting participants with a narrative identity with imagery was more relevant to well-being than the temporality of the exercise. Additionally, there may be an

unrealistic or unattainable expectation of believing the future will be so much better which may harm health outcomes.

Strengths and Limitations

The current study has several strengths, such as a large nationally representative sample. Additionally, this study takes a biopsychosocial approach to understanding the impacts of adverse childhood events. Despite these strengths, the results should be interpreted in light of its limitations. First, data collection occurred during the COVID-19 pandemic. It is possible that these events influenced participant responses including experiencing illness and stress related to the COVID-19 pandemic. Additionally, this study only assessed self-efficacy, gratitude, PERMA, and future-self in adulthood. We are unable to detangle if these resilience factors were prominent before the childhood adversity or if they were strengthened through overcoming the adversity. It would be beneficial to assess resilience traits longitudinally and investigate the development of resilience skills from childhood into adulthood.

Resilience is shaped by many factors, including experiences outside of adverse childhood events. Although the original ACEs survey is comprehensive, there are likely additional adverse childhood events that have surfaced over the last 30 years or were not initially considered (e.g., virtual abuse, witnessing or experiencing violence related to gender identity, race, and/or sexual orientation). Childhood resilience comes in many forms including physical resilience (i.e., reducing negative effects with healthy habits), mental and emotional resilience, and social resilience. Resilience develops and fluctuates as children grow. It is likely that factors that influence resilience will look different at different developmental stages.

Conclusion

The current study was the first to my knowledge to systematically examine a range of resilience factors on the association between adverse childhood events and health outcomes in adulthood. The PERMA (positive emotion, engagement, relationships, meaning, accomplishment) model of well-being, belief in oneself, and a sense of gratitude were all shown to buffer the negative impacts of adverse childhood events on health. Research must continue to investigate solutions in overcoming the consequences for children who are exposed to negative uncontrollable life events. It is critical to continue to understand the unique resilience pathways to behavioral, emotional, and physical health outcomes. Researchers must continue to investigate which interventions work for whom and under which circumstances. Although adverse events cannot always be prevented, the negative outcomes on development can potentially be mitigated by considering methods of fostering positive emotional and behavioral responses. Through understanding intrapersonal pathways in the presence of adverse childhood events it possible to promote resilient outcomes in childhood, to improve overall well-being, and achieve positive biopsychosocial outcomes.

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APPENDIX A

FUTURE-SELF FIGURES

Figure 9

Number of Adverse Childhood Events and Future-Self as Predictors of Emotional Health
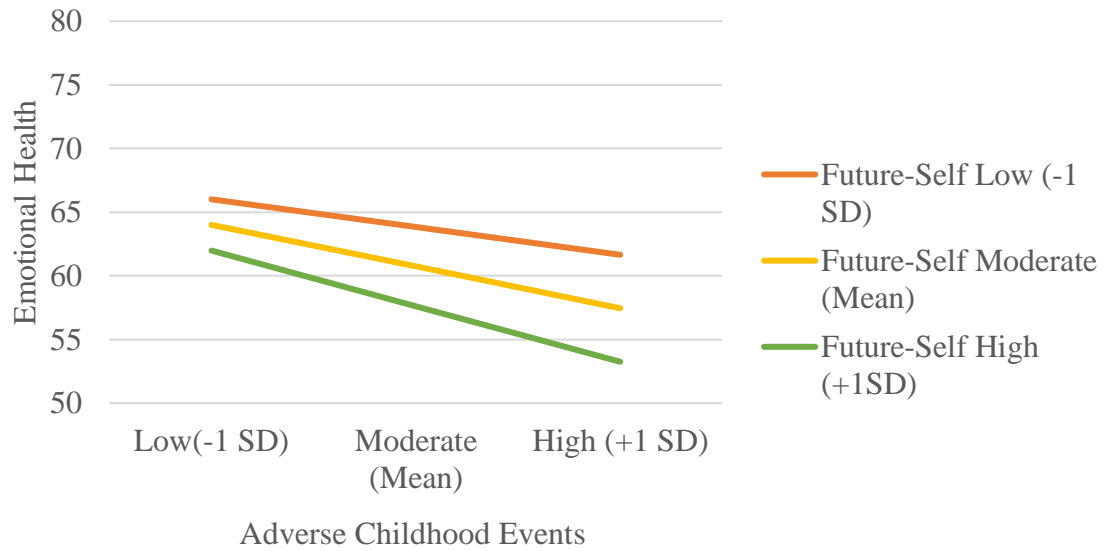
Figure 10

Number of Adverse Childhood Events and Future-Self as Predictors of Physical Health
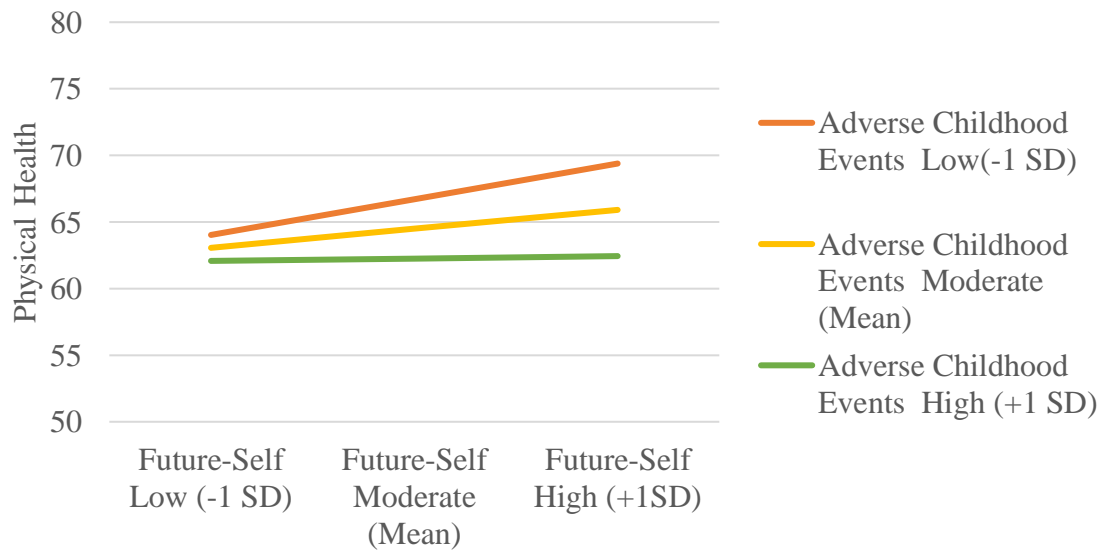
APPENDIX B

COPY OF QUALTRICS SURVEY

CONSENT FORM: I am a student at Arizona State University, and I am a part of an initiative called Resilience in Social Environments. I am conducting a research study to understand how adverse childhood events and intrapersonal traits are related to physical, behavioral and mental health in adulthood.   I am inviting your participation, which will involve approximately 15-20 minutes to complete an online survey including questions about basic demographic information, adverse childhood events, self-efficacy, your perception of your future-self, and health. You must be 18 years or older, English speaking and living in the United States to participate. Your participation in this study is voluntary. You have the right not to answer any question, and to stop participation at any time. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. You will be compensated approximately $1.25 for completing the survey. If you fail any TWO of the THREE attention checks, you will not be compensated for the survey. Once your successful completion is determined, you will be compensated.   Your participation will help us understand how to promote resilience in the presence of adverse childhood events. There are no foreseeable risks or discomforts to your participation. Data will be stored on encrypted ASU secure servers. The files will be password protected. We will not ask your name or any other identifying information in this survey. For research purposes, an anonymous numeric code will be assigned to your responses. Your ID number will be temporarily stored in order to pay you for your time; this data will be deleted as soon as it is reasonably possible. The results of this study may be used in reports, presentations, or publications but your name will not be used. The results will only be shared in the summary form.   If you have any questions concerning the research study, please contact the Principal Investigator: Dr. Kristin Mickelson at ASUYouthResilienceStudy@gmail.com. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study. By selecting "AGREE" below you are agreeing to be part of the study.

○ I Agree (1)

Page Break

We are interested in learning about how your life has been impacted by the presence or absence of adverse childhood events. Your honest answers are appreciated. Our goal is to understand how people deal with past adversities. The survey should take approximately 15-20 minutes to complete; we ask that you complete the survey in one sitting. All of your answers are anonymous and confidential; your participation is voluntary. Please answer the questions as accurately as possible. Before you start, please switch off phone/email/music so that you can focus on this survey.

Thank you!

Please enter your ID here:

_____

Q1 **What is your age?**

_____

Q2 **What state do you live in?**

_____

Q3 **What is your gender?**

○ Male (1)

○ Female (2)

○ Non-Binary (3)

○ Other (4)

Q4 **Are you Hispanic or Latinx?**

○ Yes (1)

○ No (2)

Q5 **Which of the following race/ethnicities apply to you? (Select all that apply)**

☐ White (1)

☐ Black or African American (2)

☐ American Indian or Alaska Native (3)

☐ Asian (4)

☐ Native Hawaiian or Pacific Islander (5)

☐ Other (6)

Q6 What is your current relationship status?

○ Married (1)

○ Cohabitating (2)

○ Divorced/Separated (3)

○ Widowed (4)

○ Single/Never married (5)

Q7 Are you currently involved in a romantic relationship?

○ Yes (1)

○ No (2)

Q8 What is the highest level of education you have completed?

○ Some high school (2)

○ High school/ GED (3)

○ Some college (4)

○ College (5)

○ Advanced Degree (e.g., MA/MS, PhD, MD, JD) (6)

Q9 Do you own or rent your home?

○ Own (1)

○ Rent (2)

○ Other arrangement (3)

Q10 **What is your current employment status? (Check ALL that apply)**

☐ Full-time (1)

☐ Part-time (2)

☐ Student (4)

☐ Retired (11)

☐ Unemployed (homemaker, stay at home parent, disabled, etc.) (5)

Q11 **What is your household income range?**

○ Less than $20,000 (1)

○ $20,001 to $40,000 (2)

○ $40,001 to $60,000 (3)

○ $60,001 to $80,000 (4)

○ $80,001 to $100,000 (5)

○ $100,001 to $120,000 (6)

○ More than $120,000 (7)

End of Block: Demographics

Start of Block: Future Self

Q12 **Close your eyes for 5 seconds and imagine your future self TEN years from now.**

Select the circle pair that best describes how SIMILAR you feel your current self is to your future self?

◯ Image: Screen shot 2020 11 02 at 11.14.47 am (9)

◯ Image: Screen shot 2020 11 02 at 11.14.52 am (10)

◯ Image: Screen shot 2020 11 02 at 11.15.03 am (11)

◯ Image: Screen shot 2020 11 02 at 11.15.08 am (12)

◯ Image: Screen shot 2020 11 02 at 11.15.13 am (13)

◯ Image: Screen shot 2020 11 02 at 11.15.17 am (14)

◯ Image: Screen shot 2020 11 02 at 11.15.23 am (15)

Page Break ————————————————————————————

Q13 **Imagining your future self TEN years from now, select the circle pair that best describes how CONNECTED you feel to your future self?**

◯ Image: Screen shot 2020 11 02 at 11.14.47 am (9)

◯ Image: Screen shot 2020 11 02 at 11.14.52 am (10)

◯ Image: Screen shot 2020 11 02 at 11.15.03 am (11)

◯ Image: Screen shot 2020 11 02 at 11.15.08 am (12)

◯ Image: Screen shot 2020 11 02 at 11.15.13 am (13)

◯ Image: Screen shot 2020 11 02 at 11.15.17 am (14)

◯ Image: Screen shot 2020 11 02 at 11.15.23 am (15)

Page Break ————————————————————————————

Q14 **How easy is it for you to VISUALIZE a mental picture of your future? Click and move the slider to record your answer.**

0 = Extremely difficult   6 = Extremely Easy

	0	1	2	3	4	5	6

1 ()

Q15 **How much do you LIKE your future self TEN years from now? Click and move the slider to record your answer.**

0 = Do not like at all   6 = Completely Like

	0	1	2	3	4	5	6

1 ()

Q16 **How much do you CARE about achieving your future self TEN years from now? Click and move the slider to record your answer.**

0 = Do not care at all   6 = Completely Care

	0	1	2	3	4	5	6

1 ()

Page Break

58

Q17 **When I imagine my future, it is very VIVID, and I have a clear image in my head.**

○ Strongly Disagree (1)

○ Disagree (2)

○ Somewhat disagree (3)

○ Neither agree nor disagree (4)

○ Somewhat agree (5)

○ Agree (6)

○ Strongly agree (7)

Q18 **My future feels positive and bright.**

○ Strongly Disagree (1)

○ Disagree (2)

○ Somewhat disagree (3)

○ Neither agree nor disagree (4)

○ Somewhat agree (5)

○ Agree (6)

○ Strongly agree (7)

Q19 Now.... Think back 8 to 10 years ago. How much were you able to envision a future-self at the age you were then?

○ A great deal (1)

○ A lot (2)

○ A moderate amount (3)

○ A little (4)

○ None at all (5)

Q20 **For the next set of questions select how TRUE you find the following statements to be for yourself.**

	Not at all True (1)	Barely True (2)	Moderately True (3)	Exactly True (4)
If something looks too complicated I will not even bother to try it (1)	○	○	○	○
I avoid trying to learn new things when they look too difficult (2)	○	○	○	○
When trying to learn something new, I soon give up if I am not initially successful (3)	○	○	○	○
Please select Moderately True (5)	○	○	○	○

Q21 **For the next set of questions select how TRUE you find the following statements to be for yourself.**

	Not at all True (1)	Barely True (2)	Moderately True (3)	Exactly True (4)
When I set important goals for myself, I rarely achieve them (1)	○	○	○	○
I do not seem capable of dealing with most problems that come up in my life (2)	○	○	○	○
When unexpected problems occur, I don't handle them very well (3)	○	○	○	○
I feel insecure about my ability to do things (4)	○	○	○	○

Q22 **For the next set of questions select how TRUE you find the following statements to be for yourself.**

	Not at all True (1)	Barely True (2)	Moderately True (3)	Exactly True (4)
When I make plans, I am certain I can make them work (1)	○	○	○	○
If I can't do a job the first time, I keep trying until I can (2)	○	○	○	○
When I have something unpleasant to do, I stick to it until I finish it (3)	○	○	○	○
When I decide to do something, I go right to work on it (4)	○	○	○	○
Failure just makes me try harder (5)	○	○	○	○

End of Block: Self-Efficacy

Start of Block: SF-36

Q23 **In general, would you say your health is:**

○ Excellent (1)

○ Very Good (2)

○ Good (3)

○ Fair (4)

○ Poor (5)

Q24 *Compared to one year ago*, **how would you rate your general health** *now*?

○ Much better now than one year ago (1)

○ Somewhat better now than one year ago (2)

○ About the same as one year ago (3)

○ Somewhat worse now than one year ago (4)

○ Much worse than one year ago (5)

Q25 **The following items are about activities you might do during a typical day. Does** *your <u>health now limit</u> you* **in these activities? If so, how much?**

	Yes, Limited a lot (1)	Yes, Limited a little (2)	No, Not limited at all (3)
a. *Vigorous activities,* such as running, lifting heavy objects, or strenuous sports (1)	○	○	○
b. *Moderate activities*, such as moving a table, pushing a vacuum cleaner, or bowling (2)	○	○	○
c. Lifting or carrying groceries (3)	○	○	○
d. Climbing *several* flights of stairs (4)	○	○	○
e. Climbing *one* flight of stairs (5)	○	○	○
f. Bending, kneeling, or stooping (6)	○	○	○
g. Walking *more than a mile* (7)	○	○	○
h. Walking *several blocks* (8)	○	○	○
i. Walking one block (9)	○	○	○
j. Bathing or dressing yourself (10)	○	○	○

Q26 During the *past 4 weeks*, have you had any of the following problems with your work or other regular daily activities *as a result of your physical health*? Select ALL that apply.

☐ Cut down the *amount of time* you spent on work or other activities (1)

☐ *Accomplished* less than you would like (2)

☐ Were limited in the *kind* of work or other activities (3)

☐ Had *difficulty* performing the work or other activities (for example, it took extra effort)   (4)

☐ I have NOT had any problems with work or regular physical activities as a result of my physical health (5)

Q27 During the *past 4 weeks,* have you had any of the following problems with your work or other regular daily activities *as a result of any emotional problems* (such as feeling depressed or anxious)? Select ALL that apply.

☐ Cut down the *amount of time* you spent on work or other activities (1)

☐ *Accomplished* less than you would like (2)

☐ Didn't 't do work or other activities as *carefully* as usual (3)

☐ I have NOT had any problems with work or other physical activities as a result of any emotional problems (4)

Q28 **During the *past 4 weeks*, to what extent has your physical or emotional problems interfered with your <u>normal social activities</u> with family, friends, neighbors, or groups?**

○ Not at all (1)

○ Slightly (2)

○ Moderately (3)

○ Quite a bit (4)

○ Extremely (5)

Q29 **How much *bodily* pain have you had during the *past 4 weeks*?**

○ None (1)

○ Very mild (2)

○ Mild (3)

○ Moderate (4)

○ Severe (5)

○ Very severe (6)

- -

Q30 **During the *past 4 weeks*, how much did *pain* interfere with your <u>normal work</u> (including both work outside the home and housework)?**

○ Not at all (1)

○ Slightly (2)

○ Moderately (3)

○ Quite a bit (4)

○ Extremely (5)

Q31 These questions are about how you feel and how things have been with you during the *past 4 weeks***.**

	All of the time (1)	Most of the time (2)	A good bit of the time (3)	Some of the time (4)	A little of the time (5)	None of the time (6)
Did you feel full of PEP? (1)	○	○	○	○	○	○
Have you been a very NERVOUS person? (2)	○	○	○	○	○	○
Have you felt so down in the dumps that nothing could cheer you up? (3)	○	○	○	○	○	○
Have you felt CALM and PEACEFUL? (4)	○	○	○	○	○	○
Did you have a lot of ENERGY? (5)	○	○	○	○	○	○
Have you felt DOWNHEARTED and BLUE? (6)	○	○	○	○	○	○
Did you feel WORN OUT? (7)	○	○	○	○	○	○
Have you been a HAPPY person? (8)	○	○	○	○	○	○
Please select none of the time (9)	○	○	○	○	○	○
Did you feel TIRED? (10)	○	○	○	○	○	○

Q32 **During the** *past 4 weeks*, **how much of the time has your** *physical health or emotional problems* **interfered with your** <u>social activities</u> **(like visiting with friends, relatives, etc.)?**

○ All of the time (1)

○ Most of the time (2)

○ Some of the time (3)

○ A little of the time (4)

○ None of the time (5)

Q33 **How TRUE or FALSE are** *each* **of the following statements for you?**

	Definitely true (1)	Mostly true (2)	Neither True or False (3)	Mostly False (4)	Definitely false (5)
I seem to get sick a little easier than other people (1)	○	○	○	○	○
I am as healthy as anybody I know (2)	○	○	○	○	○
I expect my health to get worse (3)	○	○	○	○	○
My health is excellent (4)	○	○	○	○	○

End of Block: SF-36

Start of Block: The Behavioral Risk Factor Surveillance System (BRFSS)

Q34 **The following questions will ask you about your health and health behaviors. Please remember that your answers are strictly confidential and that you don't have to answer every question if you do not want to.**

Q35 **Do you smoke cigarettes?**

○ Yes, every day (1)

○ Yes, some days (2)

○ No (3)

Q36 **During the past 30 days, how many days per week did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor?**

○ Less than 1 day per week (1)

○ 1 day per week (2)

○ 2 days per week (3)

○ 3 or more days per week (4)

○ No drinks in past 30 days (5)

Q37 **During the 30 days, other than your regular job, how often did you participate in any PHYSICAL ACTIVITIES or EXERCISES such as running, weight lifting, or walking for exercise per week?**

○ I did not exercise (1)

○ Less than once per week (2)

○ Once per week (3)

○ Twice a week (4)

○ Three times a week or more (5)

Q38 During the past 30 days, how often did you eat fruit (not including juices) per week?

○ I did not eat any fruit in the past 30 days (1)

○ Less than once per week (2)

○ Once a week (3)

○ Twice a week (4)

○ Three or more times a week (5)

Q39 One of the following cities is NOT in the United States. Please select "Miami" for this item.

○ Paris (1)

○ London (2)

○ Miami (3)

○ San Francisco (4)

Q40 During the past 30 days, how often did you eat vegetables per week?

○ I did not eat any vegetables in the past 30 days (1)

○ Less than once per week (2)

○ Once a week (3)

○ Twice a week (4)

○ Three or more time a week (5)

Q41 **Please read the list below. When done, please select yes if any of the situations apply to you. You do not need to say which one(s).** You have injected any drug other than those prescribed for you in the past year. You have been treated for a sexually transmitted disease or STD in the past year. You have given or received money or drugs in exchange for sex in the past year. You had sex without protection (condom, birth control, etc.) in the past year. You had four or more sex partners in the past year. **Do any of these situations apply to you?**

○ Yes (1)

○ No (2)

○ Do not know/unsure (3)

Q42 **About how long has it been since you last visited a doctor for a routine checkup?**

○ Within the past year (1)

○ 2 years ago (2)

○ 3 or more years ago (3)

Q43 **Have you ever been homeless?**

○ Yes (1)

○ No (2)

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Q44 **On average, how many hours of sleep do you get in a 24-hour period?**

○ 5 hours or less (1)

○ 6 hours (2)

○ 7 hours (3)

○ 8 hours (4)

○ 9 hours or more (5)

Q45
The next set of questions will be asking you about events that happened during your childhood; specifically, the <u>first 18 years</u> of your life.

Q46 **Did a parent or other adult in the household often...**

Swear at you, insult you, put you down, or humiliate you?
Or
Act in a way that made you afraid that you might be physically hurt?

○ Yes (1)

○ No (2)

Q47 **Did a parent or other adult in the household often...**
   Push, grab, slap, or throw something at you? **Or Ever** hit you so hard that you had marks or were injured?

○ Yes (1)

○ No (2)

Q48 **Did an adult or person at least 5 years older than you ever ...**
   Touch or fondle you or have you touch their body in a sexual way? **Or** Try to or

actually have oral, anal, or vaginal intercourse with you?

  ○ Yes (1)

  ○ No (2)

Q49 **When I was a child (under the age of 18) did you often feel that …**

No one in your family loved you or thought you were special
Or
Your family didn't look out for each other, feel close to each other, or support each other?

  ○ Yes (1)

  ○ No (2)

Q50 **When I was a child (under the age of 18) did you often feel that ...**

You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?
Or
Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?

  ○ Yes (1)

  ○ No (6)

Q51 **Were any of your parents or other adult caregivers...**
   Often pushed, grabbed, slapped, or had something thrown at them? **Or Sometimes or often** kicked, bitten, hit with a fist, or hit with something hard? **Or Ever** repeatedly hit over at least a few minutes or threatened with or hurt by a knife or gun?

  ○ Yes (1)

  ○ No (2)

Q52 **Were your parents EVER separated or divorced?**

○ Yes (1)

○ No (2)

Q53 **When I was a child (under the age of 18) ...**

Was a household member depressed or mentally ill?
Or
Did a household member attempt suicide?

○ Yes (3)

○ No (4)

Q54 **When I was a child (under the age of 18) ...**

Did you live with anyone who was a problem drinker or alcoholic?
 Or
Did you live with anyone who used street drugs?

○ Yes (1)

○ No (2)

Q55 **Did a household member go to prison?**

○ Yes (1)

○ No (2)

End of Block: ACES

Q56 The next set of questions is going to ask you about how you feel on average. **Click and move the slider to record your answer.**

	1 = Never				7 = Always		
	1	2	3	4	5	6	7
In general, how often do you feel JOYFUL? ()				▮			
In general, how often do you feel POSITIVE? ()				▮			
In general, to what extent do you feel CONNECTED? ()				▮			

Page Break

Q57 **Click and move the slider to record your answer.**

	1 = Never				7 = Always		
	1	2	3	4	5	6	7
How often do you become ABSORBED in what you are doing? ()				▮			
In general, to what extent do you feel EXCITED and INTERESTED in things? ()				▮			
How often do you lose track of time while doing something you enjoy? ()				▮			

Page Break

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Q58 **Click and move the slider to record your answer.**

	1 = Not At All	7 = Completely

	1	2	3	4	5	6	7
To what extent do you RECEIVE HELP and SUPPORT from others when you need it? ()				⬇			
To what extent do you feel LOVED? ()				⬇			
How satisfied are you with your personal relationships? ()				⬇			

Page Break

Q59 **Click and move the slider to record your answer.**

	1 = Not At All	7 = Completely

	1	2	3	4	5	6	7
In general, to what extent do you lead a PURPOSEFUL and MEANINGFUL life? ()				⬇			
In general, to what extent do you feel that what you do in your life is VALUABLE and WORTHWHILE? ()				⬇			
To what extent do you generally feel you have a SENSE of DIRECTION in your life? ()				⬇			

Page Break

Q60 **Click and move the slider to record your answer.**

	1 = Never				7 = Always		
	1	2	3	4	5	6	7
How much of the time do you feel you are making progress towards ACCOMPLISHING your goals? ()							
How often do you ACHIEVE the important goals you have set for yourself? ()							
How often are you able to HANDLE your responsibilities? ()							

Page Break

Q61 **Click and move the slider to record your answer.**

	1 = Never				7 = Always		
	1	2	3	4	5	6	7
In general, how often do you feel ANXIOUS? ()							
In general, how often do you feel ANGRY? ()							
In general, how often do you feel SAD? ()							
In general, how often do you feel LONELY in your daily life? ()							

Q62 **Taking all things together, how happy would you say you are?**

○ Extremely happy (1)

○ Somewhat happy (2)

○ Neither happy nor unhappy (3)

○ Somewhat unhappy (4)

○ Extremely unhappy (5)

End of Block: PERMA

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Q63 **Please indicate how much you agree or disagree with each statement.**

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
Lately I notice I have much in life to be thankful for. (1)	○	○	○	○	○	○	○
If I had to list everything I was grateful for over the past two weeks, it would be a very long list. (2)	○	○	○	○	○	○	○
When I look at the world, I don't see much to be grateful for lately. (3)	○	○	○	○	○	○	○
I am grateful to a wide variety of people currently in my life. (4)	○	○	○	○	○	○	○

| Over the past two weeks, I find myself more able to appreciate the people, events, and situations that have been part of my life history. (5) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **Lately, long amounts of time can go by before I feel grateful for something or someone.** (6) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Q64 **Thank you so much for your participation in this study! Is there anything else you feel we should have asked or that you would like to tell us?**

_____

Q65 **Please visit the following CDC site for information on how to prevent adverse childhood experiences:**
 https://www.cdc.gov/violenceprevention/aces/index.html

 Additionally, you may visit the American Psychological Association site for strategies to cope with stress:
 https://www.apa.org/pi/aging/09-33-coping-with-stress-fin.pdf

If you have any questions please email us at asuyouthresiliencestudy@gmail.com

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APPENDIX C

INSTITUTIONAL REVIEW BOARD APPROVAL DOCUMENTS

INSTRUCTIONS

Complete each section of the application. Based on the nature of the research being proposed some sections may not apply. Those sections can be marked as N/A. Remember that the IRB is concerned with risks and benefits to the research participant and your responses should clearly reflect these issues. You (the PI) need to retain the most recent protocol document for future revisions. Questions can be addressed to research.integrity@asu.edu. **PIs are strongly encouraged to complete this application with words and terms used to describe the protocol is geared towards someone not specialized in the PI's area of expertise.**

IRB: 1. Protocol Title: **Fostering Youth Resilience in the Presence of Adverse Childhood Events**

IRB: 2. Background and Objectives

2.1 List the specific aims or research questions in 300 words or less.

2.2 Refer to findings relevant to the risks and benefits to participants in the proposed research.

2.3 Identify any past studies by ID number that are related to this study. If the work was done elsewhere, indicate the location.

TIPS for streamlining the review time:
✓ Two paragraphs or less is recommended.
✓ Do not submit sections of funded grants or similar. The IRB will request additional information, if needed.

Response:
The proposed thesis study will examine emotional, physical, and behavioral health responses in the presence of uncontrollable adverse childhood events. The goal is to identify a potential intervention to increase resilience, health, and safe behaviors among at-risk children. The study will investigate the retrospective recall of adverse childhood events and behavioral, emotional, and physical health outcomes, intrapersonal variables including envisioning a positive future-self and self-efficacy, as well as a well-being model capturing positive emotion, engagement, relationships, meaning, and accomplishment. The study will ask participants to recall adverse childhood events and to answer questions on present emotional, physical, and behavioral health status. Past studies have investigated adverse childhood events (ACEs). The first ACEs survey was conducted in the late 1990's by the Kaiser Permanente San Diego Health Appraisal Clinic.

IRB: 3.   Data Use - What are the intended uses of the data generated from this project?

Examples include: Dissertation, thesis, undergraduate project, publication/journal article, conferences/presentations, results released to agency, organization, employer, or school. If other, then describe.

Response: The intended uses of the data from this project are for a Master's Thesis, as well as potential conferences and/or presentations and publication/journal article.

IRB: 4.   Inclusion and Exclusion Criteria

4.1 List criteria that define who will be included or excluded in your final sample. Indicate if each of the following special (vulnerable/protected) populations is included or excluded:

- Minors (under 18)
- Adults who are unable to consent (impaired decision-making capacity)
- Prisoners
- Economically or educationally disadvantaged individuals

4.2 If not obvious, what is the rationale for the exclusion of special populations?

4.3 What procedures will be used to determine inclusion/exclusion of special populations?

TIPS for streamlining the review time.

✓ Research involving only data analyses should only describe variables included in the dataset that will be used.

✓ For any research which includes or may likely include children/minors or adults unable to consent, review content [here]

✓ For research targeting Native Americans or populations with a high Native American demographic, or on or near tribal lands, review content [here]

For research involving minors on campus, review content [here]

Response:

The proposed research will be conducted online only using a Qualtrics survey posted on Amazon Mechanical Turk and ASU SONA. Participants will be limited to those living in the United States and who are at least 18 years of age, thus, excluding minors. Participants will receive an online consent form to read and sign. Those who are unable to consent will not be included in the proposed study. The proposed survey will be written in English, and individuals who are not English-speaking will not be included in the study. Any individuals with access to the online link to the Qualtrics survey and consent to participate (including prisoners, Native Americans, and undocumented individuals) will be included in the study.

IRB: 5.   Number of Participants

Indicate the total number of individuals you expect to recruit and enroll. For secondary data analyses, the response should reflect the number of cases in the dataset.

The total number of individuals expected to be recruited and enrolled is 750.

IRB: 6.   Recruitment Methods
6.1 Identify who will be doing the recruitment and consenting of participants.
6.2 Identify when, where, and how potential participants will be identified, recruited, and consented.
6.3 Name materials that will be used (e.g., recruitment materials such as emails, flyers, advertisements, etc.) Please upload each recruitment material as a separate document, Name the document:
recruitment_methods_email/flyer/advertisement_dd-mm-yyyy
6.4 Describe the procedures relevant to using materials (e.g., consent form).
✓

Response:
Participants will be recruited online through Amazon Mechanical Turk and ASU Sona by Bailey Braunstein (graduate student). The identification and recruitment of potential participants through the site and anyone who sees the study and wishes to partake in it can volunteer as long as they are English speaking and residing in the United States. Any exclusion criteria of participants will be included in the description of the study. Once potential participants select the study, the consent form will be displayed, and they will be required to read the consent form and agree to consent before beginning the study. The failure to read and agree to the consent form will result in an inability to continue with the study survey. The "short form" consent form template provided through the ASU research and integrity webpage will be adapted to include information specific to this study and used as the consent form for participants.

IRB: 7.   Study Procedures

7.1 List research procedure step by step (e.g., interventions, surveys, focus groups, observations, lab procedures, secondary data collection, accessing student or other records for research purposes, and follow-ups). Upload one attachment, dated, with all the materials relevant to this section. Name the document: supporting documents dd-mm-yyyy

7.2 For each procedure listed, describe who will be conducting it, where it will be performed, how long is participation in each procedure, and how/what data will be collected in each procedure.

7.3 Report the total period and span of time for the procedures (if applicable the timeline for follow ups).

7.4 For secondary data analyses, identify if it is a public dataset (please include a weblink where the data will be accessed from, if applicable). If not, describe the contents of the dataset, how it will be accessed, and attach data use agreement(s) if relevant.

   TIPS for streamlining the review time.
✓ Ensure that research materials and procedures are explicitly connected to the articulated aims or research questions (from section 2 above).
✓ In some cases, a table enumerating the name of the measures, corresponding citation (if any), number of items, sources of data, time/wave if a repeated measures design can help the IRB streamline the review time.

Response:
The proposed research will involve an anonymous survey given. The survey will be posted online only on Amazon Mechanical Turk and ASU Sona and will remain available until 750 participants are reached. The survey will take approximately 15-20 minutes to complete and must be completed entirely online in one sitting. The survey will include questions on basic demographic information, physical, emotional, and behavioral health outcomes, adverse childhood events, future-self perceptions, self-efficacy, positive emotion, engagement, relationships, meaning, and accomplishments.

IRB: 8.   Compensation

 8.1 Report the amount and timing of any compensation or credit to participants.

 8.2 Identify the source of the funds to compensate participants.

 8.3 Justify that the compensation to participants to indicate it is reasonable and/or how the compensation amount was determined.

 8.4 Describe the procedures for distributing the compensation or assigning the credit to participants.

 TIPS for streamlining the review time.
 ✓ If partial compensation or credit will be given or if completion of all elements is required, explain the rationale or a plan to avoid coercion
 ✓ For extra or course credit guidance, see "Research on educational programs or in classrooms" on the following page: https://researchintegrity.asu.edu/human-subjects/special-considerations.
 ✓ For compensation over $100.00, review "Research Subject Compensation" at: https://researchintegrity.asu.edu/human-subjects/special-considerations for more information.

Response:
ASU Sona respondents will receive class credit following their participation. Participants through Amazon Mechanical Turk (MTurk) will be compensated with $1.25. The source of the funds for compensation will be through funds ($1,100) provided by the New College of Interdisciplinary Arts & Sciences. The compensation amount was determined based on the length of time and effort needed to complete the study. Compensation will be provided through the payment method of approving submitted work in MTurk.

IRB: 9.   Risk to Participants
List the reasonably foreseeable risks, discomforts, or inconveniences related to participation in the research.

 TIPS for streamlining the review time.
 ✓ Consider the broad definition of "minimal risk" as the probability and magnitude of harm or discomfort anticipated in the research that are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.
 ✓ Consider physical, psychological, social, legal, and economic risks.
 ✓ If there are risks, clearly describe the plan for mitigating the identified risks.

Response:
Minimal risks are associated with this proposed research. The risk includes participants reflecting on adverse childhood events and health, which may bring up some feelings of distress. However, thinking about their past, health, and emotions is likely something that participants ordinarily do on their own.

IRB: 10. Potential Direct Benefits to Participants

List the potential direct benefits to research participants. If there are risks noted in 9 (above), articulated benefits should outweigh such risks. These benefits are not to society or others not considered participants in the proposed research. Indicate if there is no direct benefit. A direct benefit comes as a direct result of the subject's participation in the research. An indirect benefit may be incidental to the subject's participation. Do not include compensation as a benefit.

Response:
Potential benefits include that participants will have structured time to reflect on their past as well their future, which may allow them to become more cognizant of their feelings and behaviors and possibly encourage positive changes. The potential benefits outweigh the risks in that if participants complete the survey and feel satisfied with how they are dealing with past stressors, or if feel motivated to make positive changes to better cope, it could improve their mental well-being and reduce their stress.

IRB: 11. Privacy and Confidentiality

Indicate the steps that will be taken to protect the participant's privacy.

11.1 Identify who will have access to the data.

11.2 Identify where, how, and how long data will be stored (e.g. ASU secure server, ASU cloud storage,
      filing cabinets).

11.3 Describe the procedures for sharing, managing and destroying data.

11.4 Describe any special measures to protect any extremely sensitive data (e.g. password protection, encryption, certificates of confidentiality, separation of identifiers and data, secured storage, etc.).

11.5 Describe how any audio or video recordings will be managed, secured, and/or de-identified.

11.6 Describe how will any signed consent, assent, and/or parental permission forms be secured and how long they will be maintained. These forms should separate from the rest of the study data.

11.7 Describe how any data will be de-identified, linked or tracked (e.g. master-list, contact list, reproducible participant ID, randomized ID, etc.). Outline the specific procedures and processes that will be followed.

11.8 Describe any and all identifying or contact information that will be collected for any reason during the course of the study and how it will be secured or protected. This includes contact information collected for follow-up, compensation, linking data, or recruitment.

11.9 For studies accessing existing data sets, clearly describe whether or not the data requires a Data Use Agreement or any other contracts/agreements to access it for research purposes.

11.10 For any data that may be covered under FERPA (student grades, etc.) additional information and requirements is available at https://researchintegrity.asu.edu/human-subjects/special-considerations.

Experimenters Bailey Braunstein (graduate student) and Dr. Kristin Mickelson will have access to the data. Data will be stored on encrypted ASU secure servers. The files will be password protected. In using Amazon Mechanical Turk and ASU SONA, data is anonymously provided to the "requesters" (i.e., experimenters), as the data is associated with a random user ID number. IP addresses of participants will not be recorded. No personally identifying information or contact information will be collected.

IRB: 12. Consent

Describe the procedures that will be used to obtain consent or assent (and/or parental permission).

12.1 Who will be responsible for consenting participants?
12.2 Where will the consent process take place?
12.3 How will the consent be obtained (e.g., verbal, digital signature)?

TIPS for streamlining the review time.
✓ If participants who do not speak English will be enrolled, describe the process to ensure that the oral and/or written information provided to those participants will be in their preferred language. Indicate the language that will be used by those obtaining consent. For translation requirements, see Translating documents and materials under https://researchintegrity.asu.edu/human-subjects/protocol-submission
✓ Translated consent forms should be submitted after the English is version of all relevant materials are approved. Alternatively, submit translation certification letter.
✓ If a waiver for the informed consent process is requested, justify the waiver in terms of each of the following: (a) The research involves no more than minimal risk to the subjects; (b) The waiver or alteration will not adversely affect the rights and welfare of the subjects; (c) The research could not practicably be carried out without the waiver or alteration; and (d) Whenever appropriate, the subjects will be provided with additional pertinent information after participation. Studies involving confidential, one time, or anonymous data need not justify a waiver. A verbal consent or implied consent after reading a cover letter is sufficient.
✓ ASU consent templates are [here].
✓ Consents and related materials need to be congruent with the content of the application.

The consent process will occur entirely online. When participants select to partake in the study, they will first be prompted to the consent form. They will be asked to read the consent form and then they must virtually select the agreement option to the form in order to proceed with the research survey.

IRB: 13. Site(s) or locations where research will be conducted.
List the sites or locations where interactions with participants will occur-
- Identify where research procedures will be performed.
- For research conducted outside of the ASU describe:
  - Site-specific regulations or customs affecting the research.
  - Local scientific and ethical review structures in place.
- For research conducted outside of the United States/United States Territories describe:
  - Safeguards to ensure participants are protected.
- For information on international research, review the content [here].

For research conducted with secondary data (archived data):
- List what data will be collected and from where.
- Describe whether or not the data requires a Data Use Agreement or any other contracts/agreements to access it for research purposes.
- For any data that may be covered under FERPA (student grades, etc.) additional information and requirements is available [here].
- For any data that may be covered under FERPA (student grades, homework assignments, student ID numbers etc.), additional information and requirements is available [here].

✓

Response:
Research will be conducted on ASU Sona and Mturk with US participants only

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IRB: 14. Human Subjects Certification from Training.

Provide the names of the members of the research team.

ASU affiliated individuals do not need attach Certificates. Non-ASU investigators and research team members anticipated to manage data and/or interact
with participants, need to provide the most recent CITI training for human participants available at www.citiprogram.org. Certificates are valid for 4 years.

TIPS for streamlining the review time.
✓ If any of the study team members have not completed training through ASU's CITI training (i.e. they completed training at another university), copies of their completion reports will need to be uploaded when you submit.
✓ For any team members who are affiliated with another institution, please see "Collaborating with other institutions" [here]
✓ The IRB will verify that team members have completed IRB training. Details on how to complete IRB CITI training through ASU are [here]

Response:
Bailey Braunstein (graduate student), Dr. Kristin Mickelson

PROCEDURES FOR THE REVIEW OF HUMAN SUBJECTS RESEARCH

ASU Knowledge Enterprise Development

APPROVAL: EXPEDITED REVIEW

Kristin Mickelson
NCIAS: Social and Behavioral Sciences, School of (SSBS)
607/543-1632
Kristin.Mickelson@asu.edu

Dear Kristin Mickelson:

On 11/13/2020 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Fostering Youth Resilience in the Presence of Adverse Childhood Events
Investigator:	Kristin Mickelson
IRB ID:	STUDY00012861
Category of review:	
Funding:	Name: Social and Behavioral Sciences, School of; NCIAS
Grant Title:	
Grant ID:	
Documents Reviewed:	• Bailey Braunstein, Category: IRB Protocol; • Consent Form-Mturk1.pdf, Category: Consent Form; • Consent Form-Sona1.pdf, Category: Consent Form; • Qualtrics Survey-Mturk1.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Qualtrics Survey-Sona1.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Recruitment Script-Mturk1.pdf, Category: Recruitment Materials; • Recruitment Script-Sona1.pdf, Category: Recruitment Materials;

Page 1 of 2

The IRB approved the protocol from 11/13/2020 to 11/12/2022 inclusive. Three weeks before 11/12/2022 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 11/12/2022 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Bailey Braunstein
       Bailey Braunstein