

WHAT MAKES YOU STRONGER:
FURTHER CLARIFYING THE RELATIONSHIP BETWEEN CUMULATIVE
LIFETIME ADVERSITY AND WELL-BEING

BY

STEPHANIE ANN BOSSERT

A Thesis Submitted to the Graduate Faculty of
WAKE FOREST UNIVERSITY GRADUATE SCHOOL OF ARTS AND SCIENCES
in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF ARTS

Psychology

December 2021

Winston- Salem, North Carolina

Approved By:

Eranda Jayawickreme, Ph.D., Advisor

R. Michael Furr, Ph.D., Chair

Veronica Cole, Ph.D.

John Salsman, Ph.D.

ACKNOWLEDGEMENTS

This thesis was not an individual effort but a reflection of the generous support and guidance of many. First, I would like to thank my research advisor, Dr. Eranda Jayawickreme, for all of his mentorship, support, and encouragement throughout this process. I gained invaluable experience as a researcher, writer, and critical thinker under your tutelage. I would also like to thank Dr. Veronica Cole for all of her mentorship throughout my research experience, from my MAP and thesis prospectus to developing my final thesis, as a member of my thesis committee. I would also like to thank Dr. Mike Furr for his initial support and assistance in allowing me the opportunity to complete my graduate psychology studies at Wake Forest and for his support as a member of my research committees. I am grateful to Dr. John Salsman for his time and willingness to serve on my thesis committee and his valuable insight and feedback.

I am grateful to my family, friends, mentors, and professors for all their support over the last 18 months. I am so privileged and thankful to be surrounded, supported, and grounded by you all. Lastly, I am incredibly appreciative of my cohort for making my graduate school experience an unforgettable one, thanks to all of their support, kindness, friendship, and love. I have learned so much from you all and will hold dearly our memories of learning and growing together.

Specifically, I would like to thank Alex Connolly, Vanessa Gill, Elayna Seago, and Marq Schieber for their review and thoughtful comments throughout my thesis process. I am grateful for your support. I would also like to thank Casey Bales for her feedback and review throughout the thesis process as well as her

steadfast support and friendship. Finally, I would like to thank my dad for instilling in me a spirit of intellectual curiosity and deep sense of lifelong learning. Thank you for paving the way; it is an honor to follow in your footsteps. It takes a village and I would not have been able to do this without you all.

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LIST OF ABBREVIATIONS

ACE: Adverse Childhood Experience

ANOVA: Analysis of Variance

BIT: Brief Inventory of Thriving

CESD: Center for Epidemiologic Studies Depression

CLA: Cumulative Lifetime Adversity

CCA: Cumulative Childhood Adversity

EWB: Eudaimonic Well-being

FSWL: Future Satisfaction with Life

SWB: Subjective Well-being

SWL: Satisfaction with Life

ABSTRACT

While high levels of cumulative lifetime adversity (CLA) are associated with negative outcomes across a variety of domains, moderate levels of CLA have been found to predict higher levels of functioning and well-being. Additionally, research has indicated that adversity experienced in the early years of life is especially detrimental for future development. The present study extends past research on the relationship between cumulative lifetime adversity (CLA) and well-being in three ways. First, I examine the effect of both CLA and cumulative childhood adversity (CCA) on a more holistic assessment of well-being combining facets of both eudaimonic and subjective well-being (“flourishing”). I further explore the effect of CLA on subjective trajectories of satisfaction with life (SWL) derived from ratings of recollected past, current, and anticipated future SWL. Finally, I examine how different levels of CLA affect the accuracy of anticipated future SWL. Results indicated that increases in CCA were associated with lower levels of flourishing and SWL. Additionally, moderate levels of CLA were not associated with significantly better flourishing outcomes compared to high levels or no experience of CLA. Participants, regardless of their history of adversity, reported upward trajectories of SWL overtime (past SWL < present SWL < future SWL), while those with higher levels of reported CLA anticipated the greatest increase in future SWL. Finally, CLA did not moderate the concordance between predicted and actual levels of future SWL.

Keywords: cumulative lifetime adversity, well-being, life satisfaction, subjective trajectories of well-being

INTRODUCTION

Research indicates that cumulative childhood adversity (CCA) has a detrimental impact on important life outcomes in later life, such as physical and mental health (Felitti et al., 2019; Green et al., 2010; Kim et al., 2020; Luo & Waite, 2005; Poulton et al., 2002), cognitive functioning (Luo & Waite, 2005) and well-being (Hill et al., 2018; Mosely-Johnson et al., 2019). Similarly, cumulative lifetime adversity (CLA) has been associated with multiple negative life outcomes (Lupien et al., 2009; Sledjeski et al., 2008). However, recent research has highlighted a more nuanced relationship between CLA and human functioning: specifically, moderate levels of CLA may be associated with lower levels of functional impairment, post-traumatic stress symptoms, global distress as well as higher levels of life satisfaction (Seery et al., 2010, 2011), hope and optimism (Lines et al., 2020).

This work extends research on both the maladaptive function of CCA and the possible adaptive function of moderate levels of CLA in three ways. First, I examined whether the adaptive function of CLA extends to a more comprehensive measure of well-being that assesses domains of both subjective (SWB) and eudaimonic well-being (EWB), termed *flourishing*. SWB reflects a hedonic perspective of well-being and is typically operationalized in terms of high positive affect, low negative affect, and high levels of global SWL (Diener et al., 1999). EWB is a multidimensional assessment of well-being that measures flourishing in multiple domains, which may include self-acceptance, autonomy, personal growth, positive relationships with others, environmental mastery and purpose in life. I additionally examined the relationship between CCA and flourishing, replicating prior research demonstrating the adverse impacts of early, chronic

adversity on well-being (Hill et al., 2018; Mosley-Johnson et al., 2019). Second, I examined the implication of CLA on people's subjective trajectories of flourishing, derived from ratings of recollected past, current, and anticipated future SWL. While people tend to perceive their life as getting better over time (Diener & Diener, 1998; Lachman et al., 2008), those who experience early adversity report less optimistic views of the future (Broekhof et al., 2015). Third, I examined whether CLA moderates the level of concordance between people's predicted levels of future SWL and their actual SWL measured one year later. In other words, I examined whether people's history of adversity changes the degree of corroboration between their predicted future life satisfaction and their reported life satisfaction one year later.

The Impact of Adversity on Well-Being and Functioning

Life experiences, in combination with individual differences, can exhibit profound effects on multiple important life outcomes (Baltes et al., 2006; Bronfenbrenner; 2001; Lerner et al., 2011). Specifically, experiences that occur in the early years of life are especially impactful due to the rapid rate of development during this period and the influence of these events on future functioning (Alfonso & DuPaul, 2020). Additionally, adverse childhood experiences (ACE) and other early life stressors have been shown to have detrimental impacts on neural development that cascade into poorer quality of life, health, and psycho-social outcomes later in life (Anda et al., 2006). Briefly, ACE can disrupt the hypothalamic-pituitary-adrenocortical system (see Gunnar & Quevedo, 2007 for a review). The brain responds to dynamic and adverse environments by producing physiological changes that are adaptive in the short term but maladaptive in the long term (McLaughlin & Sheridan, 2016). Therefore, chronic stress

experienced during these vulnerable periods of development can have a lasting impact on future functioning (Gunnar & Quevedo, 2007). Additionally, people who experience adversity early in life can also experience poor developmental trajectories because they might not have the opportunity to develop important psychological resources, such as positive relationships and a sense of agency (Hill et al., 2018; McLeod & Almazan, 2003).

Multiple studies have revealed the association between adverse childhood experiences and poor outcomes across a variety of health and psychosocial markers. For example, one study found that ACE were associated with an increased risk of mental health disorders, sleep disturbance, perceived stress, impaired memory, and substance abuse in adulthood (Anda et al., 2006). Childhood adversities have also been found to predict first onset of mental health disorders (i.e., anxiety, mood disorder, substance use and disruptive behavior; Green et al., 2010). Additionally, experiencing at least one ACE was associated with increased risk of anxiety and depression in adolescence, while this risk directly increased with the number of ACE (Kim et al., 2020). Compared to higher childhood SES, lower SES and economic hardship in childhood have been associated with poorer outcomes in adulthood to include poor cardiovascular and dental health, cognitive functioning, self-rated memory, and higher risk of chronic health conditions (Lou & Waite, 2005; Poulton et al., 2002). Finally, a history of childhood abuse (emotional, sexual, and physical) has been associated with a multitude of poor outcomes such as increased suicide attempt, eating disorders, poor self-esteem, a decline in socioeconomic status in adulthood (Mullen et al., 1996) and psychiatric disorder (Green et al., 2010; Jaye Capretto, 2020).

In addition to mental and physical health, childhood adversity also demonstrates negative effects on psychological and subjective well-being in adulthood. Adults who experience at least one adverse event during their early years reported lower social well-being (i.e., social integration, acceptance of others, social contribution, etc.) and lower life satisfaction (Mosley-Johnson et al., 2019). Additionally, the presence of one ACE was associated with lower psychological well-being in adulthood (with the exception of the facets of autonomy and personal growth). Furthermore, childhood adversity was also associated with decreased levels of purpose in life, one domain of EWB, in adulthood (Hill et al., 2018).

In addition to adverse events experienced in the early years of life, adversities in later life can lead to the development of symptoms characteristic of post-traumatic stress, which can manifest in depressive symptoms, disturbed sleep, cognitive impairments, and behavioral changes including obsessive compulsive actions (Horowitz et al., 1980). In addition to these responses, traumatic or adverse life events can also seriously impact future well-being and functioning (Breslau et al., 1999; Seery et al., 2010). The *cumulative* effect of adverse experiences across the lifespan may have further detrimental impacts on future well-being. Chronic stress exposure, from the compounding effect of lifetime adversities, can negatively impact cognitive development and functioning (Lupien et al., 2009). Multiple adverse experiences have also been associated with an increased risk of chronic medical conditions such as heart disease and asthma (Sledjeski et al., 2008). See Table 1 below for a selective review of the impact of CCA on important life outcomes.

Table 1*Selective Review of the Impact of Childhood Adversity on Important Life Outcomes*

<i>Study</i>	<i>Research Question</i>	<i>Sample</i>	<i>Key Findings</i>
Mullen et al., 1996	How does a history of emotional, physical, and sexual abuse in childhood affect health and interpersonal relationships in adulthood?	1,376 New Zealand women ages 18 - 65	- A history of sexual, physical, and emotional abuse was associated with poor self-esteem, greater risk for suicidal behavior, poor mental health and having sexual problems in adulthood - A history of emotional abuse in childhood was specifically associated with low self-esteem while a history of childhood sexual abuse was associated with sexual problems in adulthood
Poulton et al., 2002	What is the relationship between childhood socioeconomic disadvantage and health outcomes in adulthood?	1000 children born in New Zealand surveyed at birth, ages 3, 5, 7, 9, 11, 13, 15 and 26 years	- Low childhood socioeconomic status was associated with greater risk of dental issues (tooth decay, periodontal disease, gingival bleeding), substance abuse and poorer cardiovascular health in adulthood
Anda et al., 2006	What is the cumulative and dose-response effect of adverse childhood experiences on health and emotional well-being?	17,377 adults undergoing care at the Kaiser Permanente's Health Appraisal Center, San Diego California	- Adverse childhood experience was associated with increased risk of affective disturbances (e.g., anxiety, panic reactions, depression, hallucinations) - Risk of substance abuse, severe obesity, sleep disturbances, illicit drug use, impaired memory of childhood, sexual problems, and smoking increased with adverse childhood experience score

Table 1, cont.*Selective Review of the Impact of Childhood Adversity on Important Life Outcomes*

<i>Study</i>	<i>Research Question</i>	<i>Sample</i>	<i>Key Findings</i>
Luo & Waite, 2005	What is the relationship between socioeconomic status (SES) and health across the lifespan?	19,949 participants, aged 50 years or older from the 1998 Health and Retirement Study	- Lower childhood SES was associated with lower self-rated health and memory, poorer cognitive functioning, greater risk of chronic conditions, depressive symptoms, and functional limitations compared to higher childhood SES - Those with low childhood SES but achieved upward mobility reported better outcomes than those who reported limited/no upward mobility
Green et al., 2010	What is the association between retrospectively reported childhood adversities and first onset of DSM_IV mental health disorders?	9282 adults in the United States	- Maladaptive family functioning (parental substance abuse disorder, mental illness, and criminal behavior; family violence, neglect, and abuse) were the strongest childhood adversities related to disorder onset - Models suggest that childhood adversities are related to 25.9% to 32.0% of later-onset disorder and 44.6% of childhood onset disorders
Enoch, 2011	What is the relationship between early life stress and adult drug and alcohol dependence?	A review of current literature	- Cumulative adversity experienced prior to puberty is associated with early onset of drug and alcohol dependence in early adulthood as well as drinking problems
Hill et al., 2018	What is the impact of early adverse experiences on purpose in adulthood?	3835 adults from the Midlife in the United States study	- Early adversity was associated with lower purpose in adulthood - Emotional abuse, physical abuse, health disadvantage, and SES disadvantage were significantly negatively correlated with sense of purpose

Table 1, cont.

Selective Review of the Impact of Childhood Adversity on Important Life Outcomes

<i>Study</i>	<i>Research Question</i>	<i>Sample</i>	<i>Key Findings</i>
Mosley-Johnson et al., 2019	What is the relationship between childhood adversity and psychological well-being, social well-being, and life satisfaction in adulthood?	6323 U.S. adults of the Midlife Development in the United States study	- The prevalence of one childhood adversity was associated with lower levels of satisfaction with life, environmental mastery, positive relationships with others, purpose in life, self-acceptance and social well-being compared to a history of no childhood adversity - Specifically, abuse experienced in childhood was associated with lower levels of environmental mastery, positive relationships with others, purpose in life, self-acceptance, and social well-being - Childhood household dysfunction was related to lower levels of life satisfaction, and psychological well-being, except for autonomy - Financial strain in childhood was associated with lower levels of meaningfulness of society
Kim et al., 2020	What is the impact of adverse childhood experiences on mental health in adolescents?	21,496 adolescents, aged 12-17 in the U.S.	- Anxiety was associated with neighborhood violence, living with a mentally ill family member, income hardship and racial discrimination during early years - Depression was associated with parental divorce/separation, parental death, domestic violence, living with a mentally ill family member, alcohol/drug abuse, income hardship in childhood - Experiencing both anxiety and depression was associated with neighborhood violence, alcohol/drug abuse, income hardship, parental divorce/separation

The Adaptive Function of Moderate Cumulative Lifetime Adversity

Despite the findings of the deleterious effect of CLA on psychological functioning and important life outcomes noted above, recent research has highlighted a more nuanced relationship between adversity and functioning. Although most people experience some form of life-threatening or adverse event over the course of their lives, they react to these stressors in a variety of ways (Ozer et al., 2003). *Resiliency*, one potential response, refers to the ability to maintain generally stable levels of psychological functioning and a capacity for positive, generative experiences in reaction to adverse experiences (Bonanno, 2008). This process is distinct from *recovery*, which describes a process in which normal functioning is momentarily impaired leading to depressive states and then eventually returns to pre-event levels. Although adversity is associated with multiple detrimental effects as previously discussed, resilience in the face of these trials is quite common (Bonanno, 2008).

Adverse life events provide an opportunity for resilient functioning following adverse experiences. For example, the Systematic Self-Reflection Model (Crane et al., 2018) posits that resilient responses to adversity are associated with a meta-cognitive process involving deep-awareness and evaluation of one's feelings, thoughts, and behaviors as well as the development of coping and problem-solving strategies. Daily stressors, or the exposure to multiple adversities, may be the catalyst for a conscious cycle of self-reflection on the actual stressors, effective coping strategies, and resilient outcomes, further encouraging resilient responses in the face of future adversities. Additionally, exposure to limited adversity also provides an opportunity for physiological toughening (Dienstbier, 1989). This "toughening" can also result in positive reappraisal

of future situations, and a greater ability to cope with future stressors compared to “non-toughened” individuals. The successful navigation of these stressors may further increase perceptions of self-efficacy, or the belief in the ability to achieve one’s goals (Lines et al., 2020).

Recent research has examined the adaptive function of CLA in the wake of COVID-19. Childhood disadvantage (e.g., disadvantaged neighborhood, negative family environment, etc.) predicted an increase in charitable giving, perspective taking and improved social relationships (after controlling for family dysfunction and socioeconomic factors) in the aftermath of the pandemic (Bleil et al., 2021). Additionally, moderate levels of CLA in seven categories, social/environmental stress, own injury/illness, loved one’s injury/illness, disaster, relationship stress, violence, and bereavement, were associated with higher levels of life satisfaction as well as lower levels of functional impairment and post-traumatic stress symptoms (compared to high levels or no exposure to adversity), and also moderated the negative effects of recent adverse events (Seery et al., 2010). Moderate levels of CLA were also associated with reports of lower pain intensity, fewer thoughts about pain and fewer negative emotions in experimental studies (Seery et al., 2013). Finally, recent research found that participants belonging to a moderate polyadversity (adversities experienced simultaneously) class reported higher optimism and resilience compared to those belonging to a low polyadversity class and greater optimism, resilience, self-efficacy, and hope than those in a high polyadversity class, further suggesting the adaptive function of moderate levels of CLA (Lines et al., 2020). However, CCA would most likely not demonstrate a similar adaptive function as reported above, given that early adversity has been associated with

lower levels of optimism (Broekhof et al., 2015) and fewer resilient outcomes (i.e., lower sense of self-acceptance, environmental mastery and purpose in life; Hill et al., 2018; Mosley-Johnson et al., 2019). See Table 2 below for a review of the impact of CLA on a variety of life outcomes.

Table 2*Selective Review of the Impact of Cumulative Lifetime Adversity on Important Life Outcomes*

<i>Study</i>	<i>Research Question</i>	<i>Sample</i>	<i>Key Findings</i>
<i>Breslau et al., 1999</i>	What is the effect of previous trauma exposure on posttraumatic stress disorder of subsequent trauma?	2,181 adults from the 1996 Detroit Area Survey of Trauma	- Prior experience of two or more traumatic events in childhood was associated with an increased risk for PTSD following an adverse event in adulthood - Experiencing one prior incident of assaultive violence was associated with a greater risk of PTSD following another traumatic event in adulthood
<i>Seery et al., 2010</i>	What are the quadratic effects of cumulative lifetime adversity (CLA) on important life outcomes?	2,398 U.S. adults	- Those with moderate levels of CLA reported lower functional impairment, global distress, fewer posttraumatic stress symptoms and higher life satisfaction, compared to those who had a history of no CLA or high levels of CLA - Moderate levels of CLA moderated negative effects of recent adversity exposure
<i>Seery et al., 2013</i>	What are the quadratic effects between CLA and resilience to stressors?	147 undergraduate students	- Participants with moderate levels of reported less negative pain responses and better physiological responses than those with a history of no or high level of CLA
<i>Lines et al., 2020</i>	What is the relationship between exposure to many adversities (polyadversity) and resilient outcomes?	348 university students and 1,506 community members	- Moderate polyadversity was associated with higher levels of resilience, optimism, efficacy, and hope compared to high polyadversity - Moderate polyadversity was associated with higher levels of resilience and optimism, compared to low polyadversity

Well-Being in Psychological Research

Defining and assessing well-being, flourishing and happiness have been a contested academic pursuit of many scholars in multiple fields including psychology, philosophy, and economics (Jayawickreme et al., 2012). On one hand, SWB focuses on the individual's perception of well-being; specifically, the balance between positive and negative affect, emotional responses, and the level of reported life satisfaction (Diener et al., 1999). On the other hand, EWB integrates multiple concepts of human flourishing such as Frank's concepts of meaning, Maslow's theory of self-actualization, and Jung's concept of individuation (Ryff & Singer, 2008). EWB is comprised of six different domains tapping human flourishing: self-acceptance, purpose in life, environmental mastery, positive relationships with others, personal growth, and autonomy (Ryff, 1989). Self-acceptance refers to a deeper sense of self-esteem involving awareness and acceptance of one's strengths and weaknesses. The domain of positive relationships with others recognizes the importance of love, affection, and connection with others as part of a well-lived life. Personal growth involves the continuous process of realizing one's potential, developing, and becoming. Purpose in life involves deep reflection and plays a central role in living authentically with direction and intention. Environmental mastery refers to an individual's ability to create or select environments that fit his or her needs through manipulating and navigating complex environments across the lifespan. Lastly, autonomy draws upon Maslow's concept of resistance to enculturation (Maslow, 1968) and describes the ability to look internally, not externally, for evaluation and approval (Ryff, 2008). See Table 3 below for an overview of well-being theories and assessments.

Table 3*Well-being Constructs and Measures in Psychological Literature*

<i>Construct</i>	<i>Key Concepts</i>	<i>Measures</i>
Subjective Well-being	- Positive affect and lack of negative affect, satisfaction with life ^a	- Satisfaction with Life Scale - Positive and Negative Affect Schedule (PANAS) ^b
Life Satisfaction	- Introspective assessment of how life is going, based on personal standards ^a	- Satisfaction with Life Scale ^c
Eudaimonic Well-being ^d	- Incorporates concepts of meaning, self-acceptance, positive relations with others, autonomy, environmental mastery, and personal growth	- Ryff Psychological Well-being Scale ^e
Self-Determination Theory ^f	- Competence, relatedness, and autonomy are predictors of well-being	- Multiple psychological needs scales ^g
Hierarchy of Needs ^h	- Basic needs organize into hierarchy, with physiological being the most basic to the highest need- self-actualization	- Multiple psychological needs scales ^g
Optimism	- General expectancy of positive outcomes (vs. negative outcomes)	- Life Orientation Test- Revised ⁱ
Resiliency	- Psychological adaptability/positive adjustment to life circumstance - Affective and aware ego system ^j	- Ego Resiliency Scale ^j

Note. ^a Diener, 1999, ^b Watson et al., 1998, ^c Diener et al., 1985, ^d Ryff, 1989, ^e Abbott et al., 2010, ^f Ryan & Deci, 2000, ^g Jayawickreme et al., 2012, ^h Maslow, 1948, 1971, ⁱ Scheier et al., 1994, ^j Block & Kremen, 1996

The Brief Inventory of Thriving (BIT; Su et al., 2014), was developed to address the multitude of well-being constructs and theories and measure a wide range of psychological well-being domains integrating concepts of both SWB and EWB. The BIT was used to assess flourishing in the present study. Of note, no previous study has examined the effect of CCA and CLA on this holistic measure of well-being.

Subjective Trajectories of Life Satisfaction

People's beliefs about how their lives unfold over time are an important component of their identity and self-concept (Busseri & Peck, 2015; McAdams, 1998). These beliefs enable people to make sense of past events and understand how their current self will relate to their future self in a coherent and meaningful way. Additionally, people tend to look both at the past and into the future to assess how life is going in the present (Lachman et al., 2008). These narratives require people to link together past experiences and assess progress (or decline) over time and as such can be progressive, regressive, or stable over time (Ryff, 1991). While research indicates that levels of life satisfaction remain relatively stable across the lifespan (Diener & Diener, 1996; Lachman et al., 2008), people tend to be less accurate when evaluating these trajectories as they perceive an increase in life satisfaction over time. Generally, younger adults tend to recall more negative than positive information and perceive their current life as better than their past and will only continue to get better in the future, in terms of both SWB and EWB (Lachman et al., 2008; Ryff, 1991). This perceived increase in life satisfaction across time among younger adults is supported by general life-span developmental perspectives focused on continued growth and identity development (Baltes et al., 2006, Freund, 2006) and efforts to make life go well in the future (Lachman et al., 2008). However, these

positive illusions about the future arguably result in less accurate forecasts of future life satisfaction. In contrast, older adults tend recall more positive information, viewing their past as better than the present, with no significant anticipated gains in the future (Fleeson & Heckhausen, 1997; Lachman et al., 2008; Ryff, 1991). A focus on loss avoidance for older adults and predicted stability in future life satisfaction may translate to a greater concordance between these subjective assessments of SWL and trajectories of SWL measured over time.

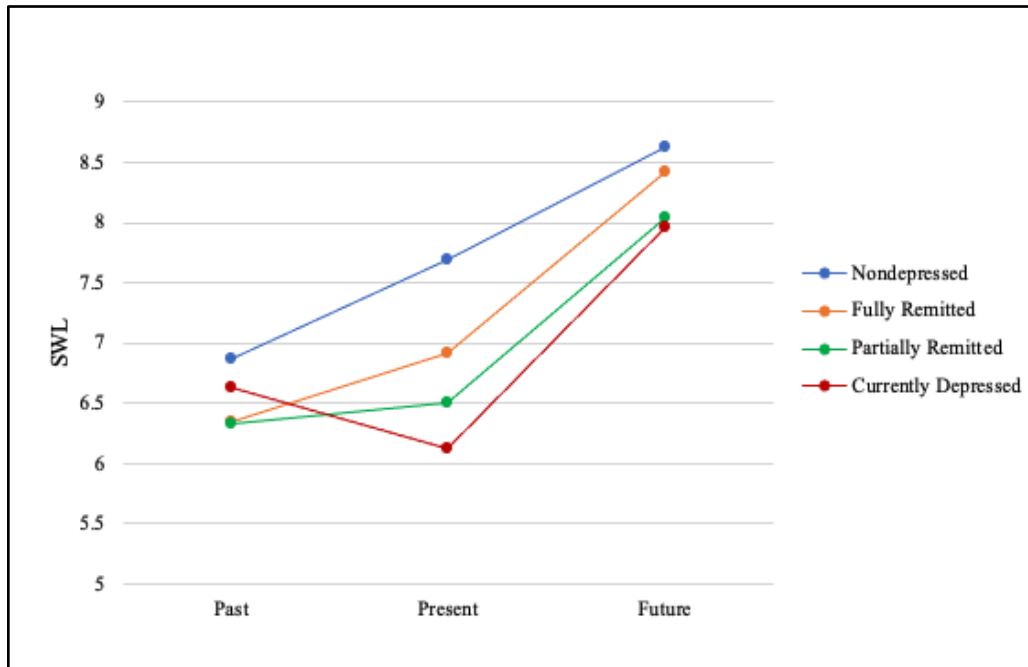
This positive bias when assessing the future is also evident in individuals who experience depressive symptoms (Busseri & Peck, 2015). Depressed individuals report a stagnant trajectory of SWL from past to future (i.e., past life satisfaction = present life satisfaction) but report an upward trajectory when predicting their future SWL, similar to nondepressed individuals (see Figure 1 below). The tendency to anticipate a brighter future and greater life satisfaction in the future is pervasive regardless of mental health status. Other research has however suggested that those with a history of childhood trauma and those with current depressive symptoms report lower levels of dispositional optimism (Broekhof et al., 2015). It may be that the trauma or depressive episode must be overcome, through time and reflection, in order to manifest resilience in the face of the event (Bostock et al., 2009).

From the current literature, the relationship between CLA and subjective trajectories of life satisfaction remains unclear. Examining this relationship between adversity (and specifically CLA) and people's subjective trajectories of life satisfaction can provide interesting insights into how people make sense of these experiences. Specifically, it is important to understand how people a) cognitively adapt to incorporate

past traumas into their life narrative, b) evaluate how life is going in the present, and c) aspire to a meaningful future.

Figure 1

The Relationship Between Subjective Trajectories of Satisfaction with Life (SWL) and Depression Status by Group as Reported in Busseri & Peck (2015)



In summary, adverse life events have a detrimental impact on several important life outcomes (Breslau et al., 1999; Seery et al., 2010). Specifically, CCA is associated with negative effects on physical and mental health as well as psycho-social well-being (Anda et al., 2006; Enoch, 201; Green et al., 2010; Hill et al., 2018; Kim et al., 2020; McLaughlin & Sheridan, 2016; Mosely-Johnson et al., 2019; Mullen et al., 1996). However, recent research has revealed a possible adaptive function of CLA: specifically, moderate levels of CLA are associated with fewer post-traumatic stress symptoms, lower functional impairment and alleviates stressors from recent adversities (Lines et al., 2020; Seery et al., 2010, 2013). While SWL tends to be relatively stable across the lifespan,

people tend to perceive an upward trajectory and anticipate future gains (Lachman et al., 2008). Additionally, research has revealed that even depressed individuals tend to anticipate a bright future (Busseri & Peck, 2015), while also revealing a link between adversity and lower optimism later in life (Broekhof et al., 2015), which in turn influences how people perceive their future.

The Present Study

This study utilized an existing dataset (Jayawickreme et al., 2021) to examine the issues described above and answer three research questions focused on the psychological impact of adverse life events. The primary purpose of this study was to examine the adaptive function of CLA on important life outcomes. First, I replicated previous research demonstrating that moderate levels of CLA are associated with higher levels of life satisfaction and extended this study by examining the effect of CLA on a more comprehensive well-being assessment (*flourishing*) that combines facets of SWB and EWB. Additionally, I examined the developmental nuances of the adaptive function of moderate levels of adversity by examining the effect of cumulative *childhood* adversity on flourishing. Second, I further explored the effect of CLA on subjective trajectories of SWL derived from ratings of recollected past, current, and anticipated future SWL. Finally, I examined how varying levels of CLA affect the accuracy of predictions of future SWL; specifically, the degree to which CLA moderates the concordance between predicted levels of future life satisfaction and measured SWL in the future (i.e., one year following the assessment of anticipated future SWL).

I predicted that moderate levels of CLA, compared to high levels of CLA or no experience of CLA, would predict better outcomes with higher reported SWL and levels

of flourishing. I hypothesized that cumulative *childhood* adversity would predict incrementally worse outcomes with lower reported SWL and levels of flourishing, as research has revealed the numerous deleterious effects of early adversity.

The second part of this study examined the effects of adversity on people's life narratives in how they recalled their past, rated their present life and predicted their future. As research has demonstrated that people generally perceive their life as getting better over time (Lachman et al., 2008), I predicted that those participants who reported a history of no adversity would report upward subjective trajectories of SWL (past < present < future). I also predicted that participants who reported high levels of CLA would also report stable trajectories of SWL from past to present (i.e., past = present), similar to retrospective reports of past SWL among depressed people (Busseri & Peck, 2015). I conducted exploratory analysis examining trajectories from present to future among those with high levels of CLA (predicted levels of future SWL), with two possible outcomes. On one hand, this group might report anticipated gains in the future (i.e., increased life satisfaction) as a way of making sense of and finding meaning in past tragedies. On the other hand, this group might report a decrease in future life satisfaction due to a lack of optimism, or positive representation of the future, similar to forecasts of future life satisfaction among those with a history of childhood trauma (Broekhof et al., 2015).

As a follow-up to the previous research question, the final research question examined whether a history of adversity affects the accuracy of SWL forecasts, or the concordance between predicted levels of future SWL and SWL measured one year later. As previous research has demonstrated, life satisfaction remains generally stable over

time (Diener & Diener, 1996; Lachman et al., 2008); however, people tend to have inflated views of future SWL, reporting a continuous increase over time (Lachman et al., 2008). As participants who report high levels of CLA might anticipate lower levels of future SWL (Hypothesis 2), they might also demonstrate greater concordance between their predicted levels of future SWL and actual SWL measured one year later (as I anticipate SWL to remain stable across the study period). This concordance would be due to a lack of optimism about the future, not necessarily more “accurate” representations of the future.

In summary, my hypotheses were as follows:

Hypothesis 1a: Moderate levels of CLA, compared to high levels of CLA or no experience of CLA, will predict better outcomes with higher reported SWL and levels of flourishing.

Hypothesis 1b: CCA will predict incrementally worse outcomes with lower reported current SWL and levels of flourishing.

Hypothesis 2: A history of no CLA will be associated with upward subjective trajectories of SWL (past < present < future), while high levels of CLA will be associated with stable trajectories of SWL from past to present (past = present).

Exploratory Analysis: Among participants with moderate levels of CLA, exploratory analysis was used to examine the subjective trajectories of SWL. In those with high levels of CLA, exploratory analysis examined subjective trajectories from present to future. Additional exploratory analysis examined the concordance between predicted future SWL and SWL measured one year later. I hypothesized that those with

high levels of CLA might demonstrate greater concordance due to a lack of optimism about the future, translating to lower levels of anticipated future SWL.

METHOD

Participants

Participants for this study were recruited via Qualtrics Panels and had to be 18 years or older with a minimum of 2 years active participation in research panels. Those who met the required minimum criteria were contacted by Qualtrics with information about the study as well as a link to the study. Participants were also emailed the informed consent document which they completed before participating in the study.

The initial sample of participants included 1244 adults, with a mean age of 47.2 years ($SD = 14.6$). Of the initial sample, 51% were women, 71% identified as white, 7% as African American/Black; 4% as Asian, and 8% as Other. Of the initial sample, 658 participants completed the Week 45 survey (48.8% female). At the final week, Week 52, 592 participants completed the final survey (49.5% female). See Appendix A for full demographic information for all three waves. This data has been used in other analyses to answer different research questions (Bossert et al., 2021; Jayawickreme et al., 2021).

Measures

Cumulative Lifetime Adversity

Seery and colleagues' (2011) Cumulative Lifetime Adversity Measure (Appendix B) asked respondents if they have ever experienced a series of adverse experiences (i.e., suffered a serious accident or injury, were physically attacked, or assaulted, serious accident or injury of a loved one), what age they were when the event started and ended and what age they were if they experienced the event multiple times (i.e., experienced financial difficulties more than once). Participants checked off all adverse events they had experienced and what age they were when the event(s) occurred. All instances of

each adverse event (up to four occurrences) were tallied to create the CLA score ($\alpha = .802$).

Cumulative Childhood Adversity

Selected items from the CLA Measure (Seery et al., 2011) were used to measure childhood adversity. Specifically, those events that occurred before age 18 were categorized as childhood adversity events. Up to four instance of each adverse event that occurred in childhood were tallied to create the CCA score.

Flourishing

The Brief Inventory of Thriving (Appendix C; Su et al., 2014), was used to capture flourishing. The BIT is a 10-item questionnaire which assess several domains of EWB and SWB. Participants were asked to rate statements (e.g., “I am achieving most of my goals”) on a scale from 1 = “Strongly disagree” to 5 = “Strongly agree”. I consider the BIT as a trait-level measure of well-being as it captures key domains of psychological flourishing at the dispositional level (see Su et al., 2014, Table 1, p. 253). Higher scores on the BIT reflect a higher level of overall flourishing ($\alpha = .954$).

Satisfaction with Life

The Temporal Satisfaction in Life Scale (Appendix D; Pavot et al., 1998) was used to assess participants’ satisfaction with their current life as well as their retrospective assessment of satisfaction with their past life and forecasts of their future life satisfaction. The TSLS is 15-item questionnaire assessing satisfaction with past, current, and future life, with 5 questions for each timeframe (e.g., “My life in the past was ideal for me”, “I am satisfied with my current life”, “I expect my future life will be ideal for me”). Participants answered questions on a 7-point scale ranging from 1 =

“Strongly disagree” to 7 = “Strongly agree”. Higher scores reflect higher levels of satisfaction with life ($\alpha = .950$).

Cumulative Lifetime Adversity Categories

In order to examine the effect of differing levels of CLA on life outcomes, I created three CLA categories: zero, moderate and high. The zero CLA group represented those with a history of no adversity. The high CLA level was designated as one standard deviation above the mean, following the methodology of Seery and colleagues (2010). The moderate CLA level was designated as those scores greater than zero and less than the high CLA level (16.29). See Table 4 below for CLA categories.

Table 4

Cumulative Lifetime Adversity Categories by Adversity Count

<i>Category</i>	<i>CLA Range</i>	<i>n</i>
<i>Zero</i>	0	76
<i>Moderate</i>	> 0 & ≤ 16.29	823
<i>High</i>	> 16.29	144

Transformations

CLA and CCA were both positively skewed. Extreme values (approximately 0.72% for CLA and 1.28% for CCA) were identified as those scores 3 standard deviations above and below the mean. To account for the positive skew of the CLA and CCA scores, I set the outliers equal to 3 standard deviations above the mean for both CLA (max score = 31) and CCA (max score = 14). See Appendix F Table F1 for descriptive results of transformed data. Using this transformation method (versus a natural log transformation) allowed me to address outliers without altering data at low adversity counts, which was key to my research questions, specifically distinguishing

between zero and low counts of CLA. Although these extreme scores could skew results, they were a small proportion of the data. As Cohen et al., (2003) recommends not addressing outliers that are less than 2% of the data, I ran all analyses with and without transformations. I report results from both the transformed and untransformed data.

Covariates

In order to examine the unique relationship between both CLA and CCA and the well-being outcomes, I included several sociodemographic and psychosocial covariates in my analyses that research has revealed as correlates of well-being (Ryff & Singer, 2008). First, research has revealed that well-being varies by age. Generally, the facets of personal growth and autonomy tend to decrease in older age, while environmental mastery tends to increase with age (Ryff, 1989, 1991; Ryff and Singer, 2008). Age was therefore included as a covariate and treated as a continuous variable. Additionally, certain environments facilitate higher SWB & EWB and as such both are associated with socioeconomic factors (Ryff & Singer, 2008). With that, income and education were also included as covariates. Income was an ordinal variable, so I used the median value for each category (i.e., \$125,000 for the \$100,000 - \$149,000), except for the \$150,000+ category, in which I used \$150,000. Education was coded dichotomously, with bachelor's degree or higher as 1 and all others as 0. Race (white and all others) and gender were coded dichotomously. Finally, I ran all analyses both controlling and not controlling for depressive symptoms, which was measured using the Center for Epidemiologic Studies Depression (CES-D) Scale ($\alpha = .925$; Radloff, 1977; See Appendix E).

Primary Analyses

Hypothesis 1a: Cumulative Lifetime Adversity and Flourishing

The first research question examined the adaptive function of CLA with regards to both SWL and flourishing (as measured by the BIT). This research question extended Seery et al. (2010, 2013) which found a quadratic relationship between CLA and global distress, functional impairment, life satisfaction, post-traumatic stress symptoms and laboratory responses to pain. I first sought to replicate this finding, examining the relationship between SWL and CLA and then extend this finding to flourishing. I hypothesized that SWL and flourishing would both demonstrate a quadratic relationship: participants who report moderate levels of CLA will exhibit higher levels of SWL and flourishing compared to those who report high levels of CLA or no experience of CLA.

In order to examine this relationship, I conducted two separate quadratic regression analyses with CLA as the predictor variable and SWL and flourishing as the outcome variables. In order to examine the unique relationship between CLA and SWL and flourishing, I controlled for gender, ethnicity, age, income, education level. I also ran these models both controlling for and not controlling for depression. Since SWL and flourishing data were collected at three time points, I examined the relationship between CLA (reported at intake) and these outcome variables at intake, Weeks 45 and 52. Additionally, I ran all analyses using the untransformed and transformed CLA scores. Therefore, there was a total of 24 regression models examining the relationship between CLA and both SWL and flourishing for Hypothesis 1a. See below for Hypothesis 1a models (controlling for depression).

Week 1

$$SWL_1 = a + b1 (CLA) + b2(CLA \times CLA) + b3 (ethnicity) + b4 (income) + b5 (depression) + b6 (education) + b7 (gender) + b8 (Age)$$

Week 45

$$SWL_2 = a + b1 (CLA) + b2(CLA \times CLA) + b3 (ethnicity) + b4 (income) + b5 (depression) + b6 (education) + b7 (gender) + b8 (Age)$$

Week 52

$$SWL_3 = a + b1 (CLA) + b2(CLA \times CLA) + b3 (ethnicity) + b4 (income) + b5 (depression) + b6 (education) + b7 (gender) + b8 (Age)$$

Week 1

$$Flourishing_1 = a + b1 (CLA) + b2(CLA \times CLA) + b3 (ethnicity) + b4 (income) + b5 (depression) + b6 (education) + b7 (gender) + b8 (Age)$$

Week 45

$$Flourishing_2 = a + b1 (CLA) + b2(CLA \times CLA) + b3 (ethnicity) + b4 (income) + b5 (depression) + b6 (education) + b7 (gender) + b8 (Age)$$

Week 52

$$Flourishing_3 = a + b1 (CLA) + b2(CLA \times CLA) + b3 (ethnicity) + b4 (income) + b5 (depression) + b6 (education) + b7 (gender) + b8 (Age)$$

Hypothesis 1b: Childhood Adversity and Flourishing

I hypothesized that SWL and flourishing would both demonstrate a linear relationship with CCA: specifically, greater CCA counts will be associated with

incrementally worse outcomes. In order to examine the unique relationship between childhood adversity and well-being in later life, I conducted two separate linear regression analyses with CCA as the predictor variable and both flourishing and SWL as the outcome variables. I conducted a linear regression, as opposed to a quadratic regression used in Hypothesis 1a, as the literature overwhelmingly reveals the negative and non-adaptive effects of adverse childhood experiences. Similar to Hypothesis 1a, I controlled for gender, ethnicity, age, income, education level and depression. Since SWL and flourishing data were collected at three time points, I examined the relationship between CCA (reported at intake) and these outcome variables at intake, Weeks 45 and 52. Additionally, I ran all analysis using the untransformed and transformed CCA scores. Therefore, there was a total of 24 regression models examining the relationship between CCA and SWL and flourishing for Hypothesis 1b. See below for Hypothesis 1b models.

Week 1

$$SWL_1 = a + b1 (CCA) + b2(ethnicity) + b3 (income) + b4 (depression) + b5 (education) + b6 (gender) + b7 (age)$$

Week 45

$$SWL_2 = a + b1 (CCA) + b2(ethnicity) + b3 (income) + b4 (depression) + b5 (education) + b6 (gender) + b7 (age)$$

Week 52

$$SWL_3 = a + b1 (CCA) + b2(ethnicity) + b3 (income) + b4 (depression) + b5 (education) + b6 (gender) + b7 (age)$$

Week 1

$$\text{Flourshing}_1 = a + b1 \text{ (CCA)} + b2(\text{ethnicity}) + b3 \text{ (income)} + b4 \text{ (depression)} + b5 \text{ (education)} + b6 \text{ (gender)} + b7 \text{ (age)}$$

Week 45

$$\text{Flourshing}_2 = a + b1 \text{ (CCA)} + b2(\text{ethnicity}) + b3 \text{ (income)} + b4 \text{ (depression)} + b5 \text{ (education)} + b6 \text{ (gender)} + b7 \text{ (age)}$$

Week 52

$$\text{Flourshing}_3 = a + b1 \text{ (CCA)} + b2(\text{ethnicity}) + b3 \text{ (income)} + b4 \text{ (depression)} + b5 \text{ (education)} + b6 \text{ (gender)} + b7 \text{ (age)}$$

Hypothesis 2: The effect of CLA on Subjective Trajectories of SWL

The second hypothesis focused on the relationship between CLA and retrospective self-reported past SWL, present SWL and predicted future SWL, all reported at intake. This study extends the findings of Lines et al., (2020) and Seery et al. (2010, 2013), which explored the adaptive function of moderate levels of CLA; Lachman et al., (2008) which explored the concordance between predicted and actual levels of future SWL; as well as those of Broekhof et al., (2015) which explored the effect of childhood trauma on positive representations of future events. I hypothesized that participants who report no CLA would demonstrate a linear, positive subjective trajectory when forecasting their future SWL, similar to subjective trajectories of SWL reported among nondepressed individuals in previous studies (Lachman et al., 2008; Busseri & Peck, 2015). However, for moderate and high levels of CLA, my analysis was exploratory in nature. For those individuals who report high levels of CLA, there are two

possible patterns of results. On one hand, high levels of CLA might be associated with an anticipated increase in SWL, or an upward trajectory (scenario 1, Figure 3), similar to forecasts of future SWL among depressed individuals (Busseri & Peck, 2015). On the other hand, high levels of CLA might be associated with an anticipated decrease in future SWL, or a downward trajectory (scenario 2, Figure 3), reflecting a lower level of optimism, similar to those with depressive symptoms and a history of childhood trauma (Broekhof et al., 2015).

I examined this relationship using a 3 (CLA Category: zero, moderate, high) X 3 (Temporal Rating: past, present, future) mixed analysis of variance (ANOVA). I also conducted two one-way ANOVAs to examine the main effect of Temporal Rating and CLA Category. Bonferroni tests for comparisons of means were conducted to examine differences in SWL scores between Temporal Ratings for each CLA category as well as the difference in SWL scores between the CLA Categories at each Temporal Rating.

Figure 2

Expected Results for Retrospective Reports Satisfaction with Life (SWL) based on Reported Levels of Cumulative Lifetime Adversity (CLA)

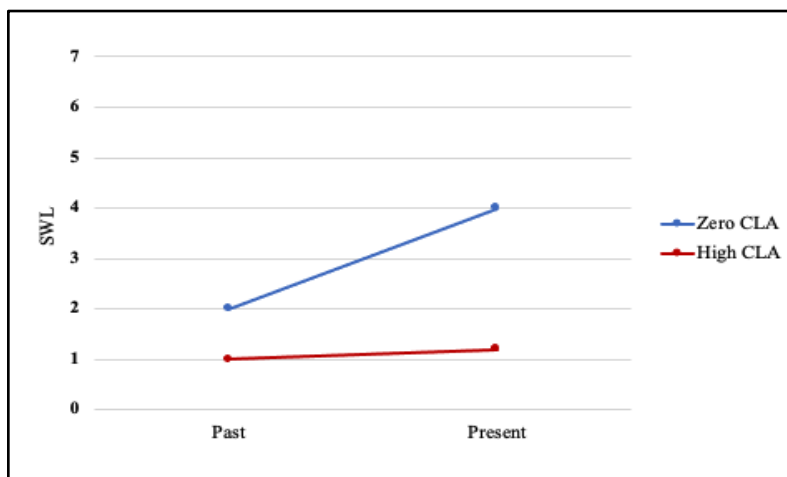
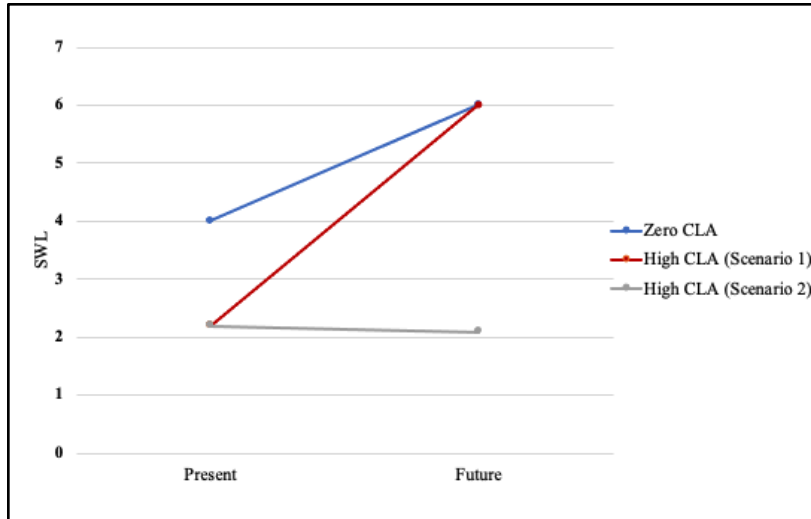


Figure 3

Expected Results for Satisfaction with Life (SWL) Forecasts based on Reported Levels of Cumulative Lifetime Adversity (CLA)



Hypothesis 3: The effect of CLA on the corroboration of SWL forecasts

I further examined the effect of CLA on the concordance between anticipated levels of future SWL (FSWL) predicted at intake and current SWL reported at Weeks 45 and 52 (SWL₂, SWL₃). This analysis was exploratory in nature. As SWL tends to remain relatively stable across the lifespan (Diener & Diener, 1996; Lachman et al., 2008), participants who have experienced higher levels of CLA might demonstrate greater concordance between their predicted levels of future SWL and their SWL measured in the future due to a lack of positive bias in representing the future, not necessarily due to an increased accuracy in these predictions. Additionally, those with a history of no lifetime adversity might not be accurate in their predictions due to these positive illusions regarding the future.

In order to examine this relationship, I conducted a linear regression analysis, with FSWL (reported at intake) as the predictor, SWL₂ as the outcome, and an interaction

term between CLA and FSWL. The interaction revealed the association between CLA and the link between FSWL and SWL₂. In order to examine the unique relationship between CLA and FSWL, I controlled for gender, ethnicity, age, income, education, and depression. Specifically, I examined the interaction coefficient of the regression and interpreted significance as the concordance between anticipated levels of future SWL (FSWL) and SWL reported one year later. I conducted this regression analysis both controlling for and not controlling for depression and with the transformed and untransformed data. Therefore, there were a total of four regression models for Hypothesis 3, which are shown below.

Week 45

$$SWL_2 = a + b_1 (FSWL) + b_2 (CLA) + b_3 (FSWL * CLA) + b_4 (gender) + b_5 (age) + b_6 (ethnicity) + b_7 (income) + b_8 (education) + b_9 (depression)$$

Week 45

$$SWL_2 = a + b_1 (FSWL) + b_2 (CLA) + b_3 (FSWL * CLA) + b_4 (gender) + b_5 (age) + b_6 (ethnicity) + b_7 (income) + b_8 (education)$$

Week 52

$$SWL_3 = a + b_1 (FSWL) + b_2 (CLA) + b_3 (FSWL * CLA) + b_4 (gender) + b_5 (age) + b_6 (ethnicity) + b_7 (income) + b_8 (education) + b_9 (depression)$$

Week 52

$$SWL_3 = a + b_1 (FSWL) + b_2 (CLA) + b_3 (FSWL * CLA) + b_4 (gender) + b_5 (age) + b_6 (ethnicity) + b_7 (income) + b_8 (education)$$

RESULTS

Demographics

The median household income was \$45,000 and approximately 55% of participants obtained a bachelor's degree or higher. The total number of adverse life events ranged from 0 to 67 ($M = 9.09$, $SD = 7.20$). A small number of participants, about 6%, reported a history of no lifetime adversity ($CLA = 0$). Death of a grandparent was the most common reported adverse event (81.9% of respondents reported experiencing), followed by death of a friend (56.6%), serious illness of a loved one (54%) and death of a father (47.7%). The total number of adverse childhood events experienced ranged from 0 to 31 ($M = 2.84$, $SD = 3.61$). See Tables 5 and 6 below for descriptive statistics for well-being variables and CLA/CCA counts.

Table 5

Descriptive Statistics for Well-being Variables

<i>Outcome</i>	<i>Time</i>	<i>Mean</i>	<i>SD</i>	<i>n</i>
<i>BIT</i>	Intake	3.61	0.82	1042
	Week 45	3.60	0.81	643
	Week 52	3.61	0.76	592
<i>SWL</i>	Intake	4.09	1.62	1040
	Week 45	4.12	1.53	641
	Week 45	4.20	1.47	590

Note. SD = standard deviation, BIT = brief inventory of thriving, SWL = satisfaction with life

Table 6

Descriptive Statistics for Cumulative Lifetime Adversity (CLA) and Cumulative Childhood Adversity (CCA)

<i>Adversity Count</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>
<i>CLA</i>	9.09	7.20	0 – 67
<i>CCA</i>	2.84	3.61	0 – 45

Note. SD = standard deviation

Hypothesis 1a: The Adaptive Function of Cumulative Lifetime Adversity

Hypothesis 1a examined the relationship between CLA and well-being, specifically SWL and flourishing. I hypothesized that moderate levels of adversity, compared to high levels or none at all, would predict better outcomes with higher reported SWL, similar to previous studies, and higher reported flourishing.

Cumulative Lifetime Adversity and Satisfaction with Life

Results from the quadratic regression analysis using the untransformed scores revealed a nonsignificant, quadratic relationship between CLA and SWL measured at intake both when controlling for depression ($\beta = 0.01, p = .970$) and not controlling for depression ($\beta = 0.01, p = .750$). Results from the regression analysis using Week 45 data revealed a similar nonsignificant, quadratic relationship between CLA and SWL at Week 45 both when controlling for depression ($\beta = 0.01, p = .278$) and not controlling for depression ($\beta = 0.01, p = .438$). Results from the regression analysis using Week 52 data revealed a similar nonsignificant, quadratic relationship between CLA and SWL at Week 52 both when controlling for depression ($\beta = 0.01, p = .436$) and not controlling for depression ($\beta = 0.01, p = .744$). See Table 7 below for full model results.

Table 7

Multiple Regression with Satisfaction with Life as the Outcome Variable and Cumulative Lifetime Adversity (CLA) as the Predictor Variable, both Controlling and Not Controlling for Depression

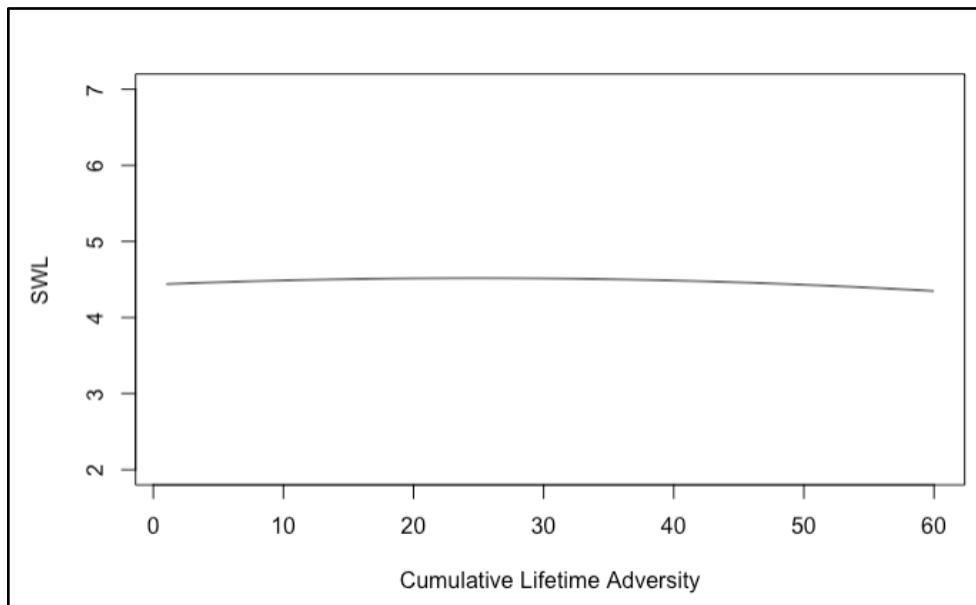
	R^2	F	β	SE_{β}	T value	p-value
Satisfaction with Life (Week 1)	.29	50.16				<.001
CLA			-0.01	0.01	-0.80	.423
CLA ²			0.01	0.01	-0.04	.970
Depression			-1.32	0.08	-16.07	<.001
Satisfaction with Life (Week 1)	.10	16.17				<.001
CLA			-0.04	0.02	-2.78	.005
CLA ²			0.01	0.01	-0.32	.750
Satisfaction with Life (Week 45)	.32	36.74				<.001
CLA			-0.02	0.02	-1.39	.166
CLA ²			0.01	0.01	1.09	.278
Depression			-1.39	0.10	-13.67	.700
Satisfaction with Life (Week 45)	.35	9.90				<.001
CLA			-0.05	0.02	-2.99	.003
CLA ²			0.01	0.01	0.78	.438
Satisfaction with Life (Week 52)	.28	26.67				<.001
CLA			-0.02	0.02	-0.89	.375
CLA ²			0.01	0.01	0.78	.436
Depression			-1.24	0.11	-11.72	<.001
Satisfaction with Life (Week 52)	.10	8.67				<.001
CLA			-0.04	0.02	-2.10	.365
CLA ²			0.01	0.01	0.33	.744

Results from the regression analysis for the transformed CLA scores also revealed a nonsignificant, quadratic relationship between CLA and SWL when both controlling for depression ($\beta = -0.01$, $p = .430$) and not controlling for depression ($\beta = -0.01$, $p = .215$). However, results from the regression analysis using Week 45 data revealed a significant quadratic relationship between CLA and SWL at Week 45 when controlling for

depression ($\beta = 0.01, p = .013$) but a nonsignificant relationship when not controlling for depression ($\beta = 0.01, p = .141$). Similarly, results from the regression analysis using Week 52 data revealed a significant quadratic relationship between CLA and SWL at Week 52 ($\beta = 0.01, p = .049$) when controlling for depression but a nonsignificant relationship when not controlling depression ($\beta = 0.06, p = .400$). See Appendix F Table F3 for full model results and Figure 4 below for predicted SWL values using transformed CLA scores.

Figure 4

Predicted Satisfaction with Life (SWL) from Transformed Cumulative Lifetime Adversity (CLA) Scores using Intake Data and Controlling for Depression



Cumulative Lifetime Adversity and Flourishing

The second purpose of Hypothesis 1a was to extend previous research examining the adaptive function of moderate levels of CLA by examining its impact on a measure of flourishing. I predicted that moderate levels of CLA, compared to high levels or no experience of CLA, would predict higher levels of flourishing. Results from the

regression analysis using the untransformed data revealed a nonsignificant, quadratic relationship between cumulative lifetime adversity and flourishing measured at intake ($\beta = -0.01, p = .380$), Weeks 45 ($\beta = 0.01, p = .670$) and 52 ($\beta = -0.01, p = .930$) when controlling for depression. When not controlling for depression, results also revealed a nonsignificant, quadratic relationship between CLA and flourishing measured at intake ($\beta = -0.01, p = .300$), and Weeks 45 ($\beta = 0.01, p = .882$) and 52 ($\beta = -0.01, p = .590$). See Table 8 below for full model results.

Table 8

Multiple Regression with Flourishing as the Outcome Variable and Cumulative Lifetime Adversity (CLA) as the Predictor Variable, both Controlling and Not Controlling for Depression

	R^2	F	β	SE_{β}	T value	p-value
Flourishing (Week 1)	.48	11.40				<.001
CLA			0.01	0.01	1.19	.230
CLA ²			-0.01	0.01	-0.87	.380
Depression			-0.96	0.04	-26.90	<.001
Flourishing (Week 1)	.10	15.87				<.001
CLA			-0.02	0.01	-2.05	.040
CLA ²			-0.01	0.01	-1.05	.300
Flourishing (Week 45)	.29	39.61				<.001
CLA			0.01	0.01	0.57	.573
CLA ²			0.01	0.01	0.43	.670
Depression			-0.08	0.05	-15.79	<.001
Flourishing (Week 45)	.07	6.81				<.001
CLA			-0.01	0.01	-1.45	.148
CLA ²			0.01	0.01	0.15	.882

Table 8, cont.

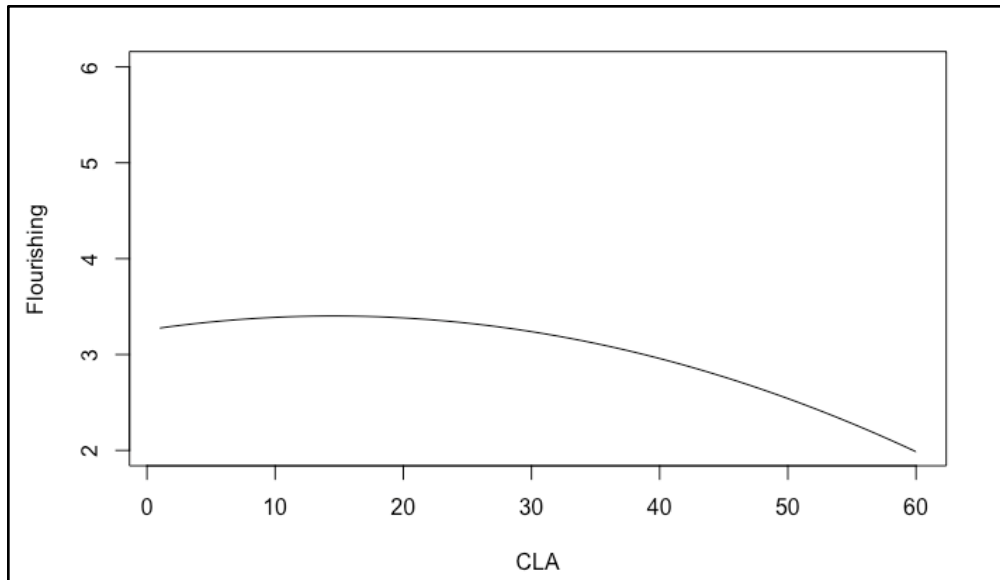
Multiple Regression with Flourishing as the Outcome Variable and Cumulative Lifetime Adversity (CLA) as the Predictor Variable, both Controlling and Not Controlling for Depression

	R^2	F	β	SE_{β}	T value	p-value
Flourishing (Week 52)	.34	35.61				<.001
<i>CLA</i>			0.01	0.01	0.60	.550
<i>CLA</i> ²			-0.01	0.01	-0.09	.930
<i>Depression</i>			-0.76	0.05	-14.74	<.001
Flourishing (Week 52)	.08	6.88				<.001
<i>CLA</i>			-0.01	0.01	-1.00	.830
<i>CLA</i> ²			- 0.01	0.01	-0.54	.590

Results from the quadratic regression analysis using the transformed CLA scores revealed a significant quadratic relationship between CLA and flourishing measured at intake, both when controlling for depression ($\beta = -0.01$, $p = .030$) and not controlling for depression ($\beta = -0.01$, $p = .018$). However, results from the regression analysis using Week 45 data revealed a nonsignificant quadratic relationship between CLA and flourishing at Week 45 when both controlling for depression ($\beta = 0.01$, $p = .252$) and not controlling for depression ($\beta = 0.01$, $p = .839$). Results from the regression analysis using Week 52 data replicated findings from Week 45, revealing a nonsignificant quadratic relationship between CLA and flourishing at Week 52 both when controlling for depression ($\beta = 0.01$, $p = .742$) and not controlling for depression ($\beta = -0.01$, $p = .405$). See Figure 5 below for predicted levels of flourishing. See Appendix F Table F3 for full model results.

Figure 5

Predicted Levels of Flourishing from Transformed Cumulative Lifetime Adversity (CLA) Scores) using Intake Data and Controlling for Depression



Hypothesis 1b: Examining the Maladaptive Function of Childhood Adversity

Hypothesis 1b examined the relationship between adversity experienced specifically in early years (CCA) and SWL and flourishing reported in adulthood. I hypothesized that in line with previous studies, CCA would predict worse outcomes with lower reported SWL and flourishing.

Cumulative Childhood Adversity and Satisfaction with Life

Results from the linear regression examining the untransformed CCA scores indicated a nonsignificant relationship between childhood adversity (measured at intake) and SWL measured at intake ($\beta = -0.01$, $p = .338$), Week 45 ($\beta = -0.01$, $p = .974$) and 52 ($\beta = 0.01$, $p = .596$) when controlling for depression. However, when not controlling for depression, results revealed a significant inverse relationship between CCA (measured at intake) and SWL measured at intake ($\beta = -0.07$, $p < .001$), Week 45 ($\beta = -0.06$, $p < .001$) and 52 ($\beta = -0.05$, $p = .006$). See Table 9 below for full models results.

Table 9

Multiple Regression with Satisfaction with Life as the Outcome Variable and Cumulative Childhood Adversity (CCA) as the Predictor Variable, both Controlling and Not Controlling for Depression

	R^2	F	β	SE_{β}	T value	p -value
Satisfaction with Life (Week 1)	.29	57				< .001
CCA			-0.01	-0.01	-0.96	.338
Depression			-1.35	0.08	-16.58	< .001
Satisfaction with Life (Week 1)	.09	16.14				< .001
CCA			-0.07	0.01	-5.16	< .001
Satisfaction with Life (Week 45)	.31	39.36				< .001
CCA			-0.01	0.02	-0.03	.974
Depression			-1.42	0.10	-14.02	< .001
Satisfaction with Life (Week 45)	.09	9.90				< .001
CCA			-0.06	0.02	-3.69	< .001
Satisfaction with Life (Week 52)	.28	30.44				< .001
CCA			0.01	0.02	0.53	.596
Depression			-1.26	0.11	-12.02	< .001
Satisfaction with Life (Week 52)	.09	9.02				< .001
CCA			-0.05	0.02	-2.75	.006

Results from the transformed CCA scores revealed a similar pattern of results. These results indicated a nonsignificant relationship between childhood adversity and SWL measured at intake ($\beta = 0.01$, $p = .338$), Week 45 ($\beta = 0.02$, $p = .967$) and 52 ($\beta = 0.02$, $p = .526$) when controlling for depression. When not controlling for depression, results revealed a significant inverse relationship between CCA and SWL measured at intake ($\beta = -0.08$, $p < .001$), Week 45 ($\beta = -0.08$, $p < .001$) and 52 ($\beta = -0.05$, $p = .012$). See Appendix F, Table F4 for full model results.

Cumulative Childhood Adversity and Flourishing

Results from the linear regression with the untransformed CCA scores revealed a nonsignificant relationship between CCA and flourishing at intake ($\beta = 0.01, p = .258$) when controlling for depression and a significant inverse relationship when not controlling for depression ($\beta = -0.04, p < .001$). However, results from the Week 45 data revealed a significant relationship between CCA and flourishing at Week 45 both when controlling for depression ($\beta = 0.01, p = .032$) and not controlling for depression ($\beta = -0.02, p = .031$). Furthermore, results from the Week 52 data replicated the findings from intake and revealed a nonsignificant relationship between CCA and flourishing when controlling for depression ($\beta = 0.01, p = .133$) but a significant relationship when not controlling for depression ($\beta = -0.01, p = .014$). See Table 10 below for full model results.

Table 10

Multiple Regression with Flourishing as the Outcome Variable and Cumulative Childhood Adversity (CCA) as the Predictor Variable, both Controlling and Not Controlling for Depression

	R^2	F	β	SE_{β}	T value	p-value
Flourishing (Week 1)	.48	130.4				<.001
CCA			0.01	0.01	1.13	.258
Depression			-0.96	0.04	-26.90	<.001
Flourishing (Week 1)	.09	16.01				<.001
CCA			-0.04	0.01	-5.13	<.001
Flourishing (Week 45)	.35	45.58				<.001
CCA			0.01	0.01	2.15	.032
Depression			-0.82	0.05	-15.96	<.001
Flourishing (Week 45)	.07	7.50				<.001
CCA			-0.02	0.01	-2.16	.031
Flourishing (Week 52)	.34	41.03				<.001
CCA			0.01	0.01	1.51	.133
Depression			-0.76	0.05	-14.97	<.001
Flourishing (Week 52)	.08	7.48				<.001
CCA			-0.01	-0.02	-2.47	.014

Results from the linear regression for the transformed CCA scores revealed a similar pattern of results as the untransformed data. Results indicated a nonsignificant relationship between CCA and flourishing measured at intake ($\beta = 0.01$, $p = .298$) and Week 52 ($\beta = 0.01$, $p = .121$) when controlling for depression and a significant inverse relationship when not controlling for depression (Intake: $\beta = -0.01$, $p < .001$; Week 52: $\beta = -0.01$, $p = .024$). Results from the regression analysis using Week 45 data revealed a significant relationship between CCA and flourishing when controlling for depression (β

= -0.01, $p = .031$) and when not controlling for depression ($\beta = -0.01$, $p = .024$). See Appendix F4, Table F4 for full model results.

Hypothesis 2: CLA and Subjective Trajectories of Satisfaction with Life

Hypothesis 2 explored the effect of CLA on people's subjective trajectories of life satisfaction. In other words, I explored how a person's history of adversity affects the way they view their past, assess their current life and think about their future. I predicted that those who reported no history of adversity would see life as getting better over time (past < present < future,) while those who reported high levels of reported CLA would see their past as similar to the present. Exploratory analysis examined subjective trajectories among those with a moderate level of CLA as well as anticipated levels of future SWL among those with high levels of reported CLA. On one hand, those with high levels of reported CLA might anticipate life to get better due to positive illusions about the future. On the other hand, they might not anticipate life to get better due to their past experiences with adversity.

In order to examine this research question, I conducted a 3 (CLA Category: zero, moderate, high) X 3 (Temporal Rating: past, present, future) mixed ANOVA examining SWL ratings. Results from the ANOVA revealed a significant main effect for CLA category $F(2, 1037) = 26.44$, $p = .035$, and for Temporal Rating $F(2, 1956.87) = 70.61$, $p = .019$. The CLA Category X Temporal Rating interaction, $F(3.77, 1956.97) = 7.27$, $p = .004$, was also significant. Bonferroni tests for comparisons of means were conducted to examine the effect of CLA Category at each Temporal Rating and the effect of Temporal Rating on each CLA Category.

General Trends

All three groups reported life as getting better over time with positive trends in SWL from past to future (see Figure 6 below). Retrospectively reported past SWL was rated lower than present SWL for all three CLA groups. Additionally, all three groups anticipated future gains, rating their future SWL higher than their present SWL. See Table 11 below for retrospectively reported past SWL, present SWL, and predicted future SWL by CLA Category.

Figure 6

Subjective Trajectories of Satisfaction with Life by Cumulative Lifetime Adversity Category

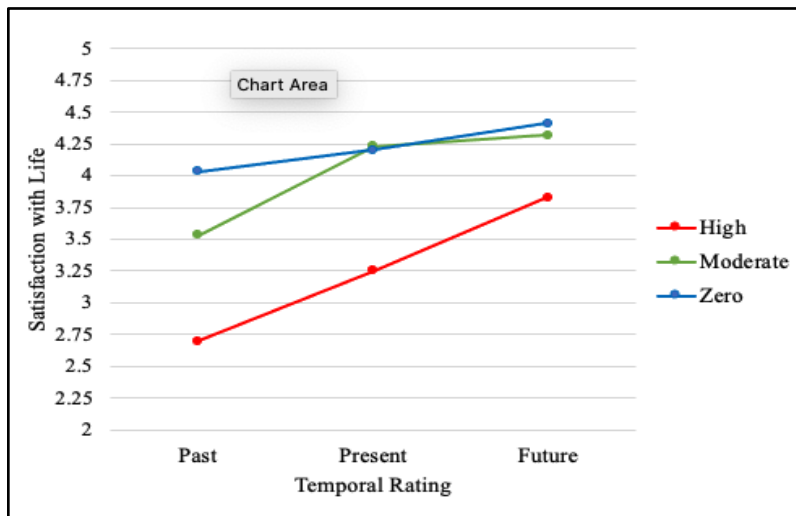


Table 11

Reported Satisfaction with Life (SWL) for each Cumulative Lifetime Adversity (CLA) Category at Each Temporal Rating

<i>CLA Category</i>	<i>Temporal Rating</i>	<i>M_{SWL}</i>	<i>SD_{SWL}</i>	<i>n</i>
High	Past	2.70	1.32	144
	Present	3.25	1.59	
	Future	3.83	1.38	
Moderate	Past	3.54	1.44	822
	Present	4.23	1.59	
	Future	4.32	1.29	
Zero	Past	4.03	1.43	74
	Present	4.20	1.54	
	Future	4.41	1.41	

Note. M = mean, SD = standard deviation

Main Effect of CLA Category

To further examine the main effect of CLA Category, I conducted a one-way ANOVA comparing each CLA Category's score (high, moderate and zero) at each Temporal Rating (past, present, and future). Results indicated a significant effect of CLA Category at all three Temporal Ratings: Past $F(2, 1037) = 27.83, p < .001$; Present $F(2, 1037) = 23.44, p < .001$; and Future $F(2, 1038) = 9.33, p < .001$. I conducted Bonferroni tests to examine mean differences in SWL scores between the CLA categories at each Temporal Rating. See Table 12 below for results.

Table 12

Results Comparing Reported Satisfaction with Life (SWL) between Cumulative Lifetime Adversity (CLA) Category at each Temporal Rating

<i>Temporal Rating</i>	<i>Comparison</i>	<i>p adj.</i>
Past	High vs. Moderate	<.0001
	High vs. Zero	<.0001
	Moderate vs. Zero	.001
Present	High vs. Moderate	<.0001
	High vs. Zero	<.0001
	Moderate vs. Zero	1.00
Future	High vs. Moderate	<.0001
	High vs. Zero	.006
	Moderate vs. Zero	1.00

Past. For the retrospectively rated past SWL, there was a significant difference between the high CLA group and both the moderate and zero CLA groups such that the high CLA group's reported past SWL was significantly lower than the other two groups' reported past SWL. There was also a significant difference between the moderate and zero CLA groups such that the moderate CLA group's reported past SWL was significantly lower than the zero CLA group's reported past SWL.

Present. For present SWL, there was a significant difference between the high CLA group and both the moderate and zero CLA groups such that the high CLA group's present SWL was significantly lower than the other two groups' reported present SWL. There was not a significant difference between the moderate and zero CLA groups' present SWL.

Future. For predicted future SWL, there was a significant difference between the high CLA group and both the moderate and zero CLA groups such that the high CLA group's anticipated future SWL was significantly lower than the other two groups'

anticipated future SWL. There was not a significant difference between the moderate and zero CLA groups' anticipated future SWL.

Main effect of Temporal Category

To further examine the main effect of Temporal Category, I conducted a one-way ANOVA. Results indicated a significant effect of Temporal Category on each CLA category: High: $F(2, 286) = 43.70$ $p < .001$; Moderate: $F(2, 1543) = 177.76$, $p < .001$; Zero: $F(2, 125) = 3.77$ $p < .001$. I conducted Bonferroni tests to examine mean SWL differences for each CLA Category between the Temporal Ratings. See Table 13 below for results.

Table 13

Results Comparing Reported Satisfaction with Life (SWL) between each Temporal Rating for each Cumulative Lifetime Adversity (CLA) Category

<i>CLA Category</i>	<i>Temporal Rating</i>	<i>p adj.</i>
High	Past vs. Present	< .0001
	Past vs. Future	< .0001
	Present vs. Future	< .0001
Moderate	Past vs. Present	< .0001
	Past vs. Future	< .0001
	Present vs. Future	.702
Zero	Past vs Present	.070
	Past vs. Future	.060
	Present vs. Future	.180

High CLA. The high CLA group reported an upward, linear trend in SWL across the temporal ratings. Specifically, this group reported their past SWL as significantly lower than their present SWL and their predicted future SWL significantly higher than their present SWL.

Moderate CLA. The moderate CLA group reported an upward, yet nonlinear trend in SWL. They reported a significant increase in SWL from past to present. From present to future however, they predicted a similar, yet nonsignificant, increase in SWL.

Zero CLA. The zero CLA group reported an upward, linear trend in SWL with an increase from past, to present and anticipated future SWL. However, unlike the other two groups, neither of these increases were significant.

Hypothesis 2 Results Using Transformed Scores

The transformed data, with a maximum CLA score set to 31, shifted CLA categories slightly (see Appendix F, Table F2). Results for Hypothesis 2 with this new categorization yielded similar results with one exception. For the moderate CLA group, predicted future SWL was not significantly higher than present SWL, while this increase in SWL was significant using the untransformed scores (See Table 13). See Appendix F, Tables F5 - F7 for complete results for Hypothesis 2 using transformed CLA scores.

Hypothesis 3: Corroboration of Predicted Future Satisfaction with Life

Exploratory analysis examined how people's history of adversity affects the accuracy at which they predict their future life satisfaction. I predicted that those with high levels of reported CLA might be more accurate in their predictions due to a lack of optimism when looking into the future.

I first examined changes in reported SWL from intake to Week 45 and Week 52 to assess changes in reported SWL across time. Results from a one-way, repeated measures ANOVA revealed no significant main effect of time, $F(2) = 0.24, p = .787$. Results from the pairwise comparisons of SWL between all three time points (intake, Week 45, and Week 52) indicated no significant changes in SWL over the 52 weeks.

However, participants reported an anticipated increase in future SWL, regardless of their history of adversity as discussed previously. Additionally, results from the regression analysis revealed a non-significant interaction between CLA and predicted future SWL (FSWL; see Table 14 below). CLA did not moderate the concordance between anticipated SWL and reported SWL measured one year later. Results from the transformed data revealed a similar, nonsignificant interaction between CLA and FSWL (See Appendix F, Table F8).

Table 14

Multiple Regression Results Examining the Interaction between Predicted Future Satisfaction with life (FSWL) and Cumulative Lifetime Adversity (CLA) both Controlling for and not Controlling for Depression

	R^2	F	β	SE_{β}	T value	p-value
Satisfaction with Life (Week 45)	.47	57.22				<.001
CLA			0.14	0.02	0.87	.390
Predicted SWL (FSWL)			0.56	0.06	10.72	<.001
Interaction			-0.01	0.01	-1.20	.230
Depression			-0.82	0.10	-8.15	<.001
Satisfaction with Life (Week 45)	.41	50.66				<.001
CLA			-0.01	0.02	-0.62	0.53
Predicted SWL (FSWL)			0.68	0.57	12.09	<.001
Interaction			-0.01	0.01	-0.50	.620
Satisfaction with Life (Week 52)	.43	45.70				<.001
CLA			0.02	0.02	1.30	.200
Predicted SWL (FSWL)			0.56	0.06	9.64	<.001
Interaction			-0.07	0.01	-1.43	.150
Depression			-0.01	0.10	-6.90	<.001
Satisfaction with Life (Week 52)	.38	42.04				<.001
CLA			-0.01	0.02	-0.62	.530
Predicted SWL (FSWL)			0.67	0.59	11.40	<.001
Interaction			-0.01	0.01	-0.87	.380

DISCUSSION

The main purpose of this study was to extend existing research of the adaptive function of cumulative lifetime adversity. Specifically, I first sought to replicate prior research revealing a relationship between moderate levels of CLA and higher levels of life satisfaction (Seery et al., 2010) and extend this finding to flourishing, a holistic concept of well-being. Furthermore, I sought to extend the multitude of studies indicating the detrimental impact of cumulative childhood adversity (Anda, 2006; Enoch, 2011; Green et al., 2010; Kim et al., 2020; Luo & Waite, 2005; McLaughlin & Sheridan, 2016; Mullen et al., 1996; Poulton et al., 2002) and replicate prior research revealing its negative effect on future flourishing (Mosley-Johnson et al., 2019; Hill et al., 2018).

The second goal of this study was to further explore subjective trajectories of life satisfaction, and specifically how people's history of adversity affects their assessments of the future. Although life satisfaction remains stable over the lifespan (Diener & Diener, 1996) people tend to perceive their life as getting better across time (Lachman et al., 2008). Through this study, I sought to understand whether an additional adaptive function of adversity is potentially greater accuracy when predicting future life satisfaction, due to less inflated views of the future.

Hypothesis 1

The purpose of hypothesis 1 was to further examine the effects of CLA and CCA on future well-being. Hypothesis 1a predicted that moderate levels of CLA would predict higher levels of both SWL and flourishing, compared to high levels or no experience of CLA. Although those who experienced moderate levels of adversity reported slightly higher levels of SWL and flourishing, compared to those who reported high levels of or

no experience of CLA when using the transformed data, these well-being outcomes were not consistently higher across all three time points. Additionally, results from the untransformed data did not reveal a significant quadratic relationship between these two outcomes and CLA. The results from the present study failed to replicate and extend the findings from Seery and colleagues (2010, 2013), which found that moderate levels of CLA were associated with higher life satisfaction, lower global distress, lower functional impairment, and lower post-traumatic stress symptoms. Therefore, Hypothesis 1a was not supported.

Hypothesis 1b further explored the maladaptive function of CCA and predicted that higher CCA counts would be associated with worse outcomes due to the developmental timing of these adversities and their effect on future psychosocial, biological, and physiological development. Results indicated that childhood adversity was associated with lower SWL at all three time points (when not controlling for depression). These results were consistent across the untransformed and transformed data. Results were more nuanced for flourishing across all three time points. CCA predicted lower flourishing at intake and Week 52 when not controlling for depression (for both the untransformed and transformed data). However, CCA predicted lower flourishing at Week 45 both when controlling and not controlling for depression. Despite these nuances, results generally support previous research revealing the detrimental and long-term effects of childhood trauma on a variety of outcomes in later life, and specifically lower well-being and SWL (Hill et al., 2018; Mosely-Johnson et al., 2019). Results from the present study further support theories highlighting the negative impact of childhood trauma on future flourishing. Hypothesis 1b was supported. Additionally, for a majority of analyses CCA

predicted poorer well-being outcomes when not controlling for depression but failed to demonstrate this relationship when controlling for depression. This pattern of results suggests that those who experienced early adversity also experience depressive symptoms, which is in line with previous research examining the deleterious effect of childhood adversity (Anda et al., 2006; Felitti et al., 2019; Kim et al., 2020) as mentioned previously.

Hypothesis 2

The purpose of Hypothesis 2 was to explore the effect of adversity on subjective trajectories of life satisfaction. Specifically, Hypothesis 2 predicted that participants with a history of *no* lifetime adversity would view life as getting better over time. Results were consistent with this prediction as this group reported an increase in life satisfaction across all three temporal ratings (although these increases were not significant between the three time points).

Those with *moderate* levels of CLA also perceived their life as getting better from past to present. This reported increase in life satisfaction from past to present was less significant than the high CLA group but more significant than the zero CLA group. This group also reported a higher level of current SWL than both the zero and high CLA groups, which is consistent with previous research indicating the adaptive function of moderate levels of CLA (Lines et al., 2020; Seery et al., 2010, 2013).

Looking into the future, the moderate CLA group anticipated a slight increase in satisfaction with life, with a smaller anticipated gain than their perceived increase in life satisfaction from past to present. This interesting finding parallels trends among older adults when predicting future life satisfaction. Older adults tend to report the least

inflated views of future life satisfaction and thus demonstrate greater concordance between their predicted and actual SWL than younger adults (Lachman et al., 2008). These results indicate another potential adaptive function of moderate levels of CLA as this group predicted the smallest increase in future SWL, mirroring general patterns of actual life satisfaction overtime. However, it is important to note that despite this pattern of results, the moderate CLA group did not demonstrate greater accuracy in their predictions of future SWL compared to the other two groups.

Regarding those with a high level of reported CLA, Hypothesis 2 predicted that this group would not see their life as getting better from past to present and would subsequently report a decrease or no change in SWL. However, results indicated the opposite: this group perceived a significant increase in life satisfaction from the past to present. One potential explanation for this perception that life is getting better among those with high levels of CLA is that these participants viewed their trajectory from past to present as one of recovery. The notion of *redemption*, or the movement from past suffering to a positive present state, is one key component of affective themes or emotional trajectories as people construct their life narratives (McAdams, 2006; McLean et al., 2020). Additionally, this trend among those with high levels of reported CLA differs from trends among depressed individuals who tend to view their past life as better than their current life (Busseri & Peck, 2015). This disparity indicates that a *history* of adversity has a different influence on the way in which people develop their life narrative than current depressive states do, by framing the present as an improvement from the past.

Regarding future life satisfaction, exploratory analysis indicated that those with high levels of reported CLA anticipated life to continue to get better, with an anticipated increase in life satisfaction. These results are consistent with prior research revealing that people generally anticipate life to get better (Lachman et al., 2008) and even people with depressive symptoms expect these future gains (Busseri & Peck, 2015). One explanation for this anticipated improvement in life satisfaction over time among those with a history of adversity is that when people are faced with threatening information, such as multiple adverse experiences, positive illusions can serve as coping strategies by facilitating a sense of control and positive self-view (Taylor, 1983; Taylor & Armor, 1996). For those with a history of adversity, projections of a brighter future might serve as one way to cope with past adversities. Another possible explanation for participants anticipated future gains despite past adversities is a perception of growth as they seek to find meaning in their adversities and to further incorporate them into a coherent life narrative (Jayawickreme et al., 2012; Pals & McAdams, 1994). Furthermore, participants with *high* levels of reported CLA anticipated greater future gains compared to those who reported *moderate* levels CLA, potentially indicating that greater counts of past adversities resulted in a greater need to make sense of these events and find meaning through future gains, which transpired into more positive views of the future.

Finally, those who reported high levels of CLA also experienced lower levels of flourishing and SWL, yet they still perceived their life as getting better over time. This disparity between perceptions of growth and increased measured flourishing over time supports discussions distinguishing between perceived positive changes and veridical positive personality change following adversity (Blackie et al., 2016; Frazier et al., 2009;

Infurna & Jayawickreme, 2019; Jayawickreme & Blackie, 2014; Owenz & Fowers, 2019; Yanez et al., 2011).

Hypothesis 3

The purpose of Hypothesis 3 was to understand how different levels of CLA affect how accurate people are in their predictions of future life satisfaction. In line with past research (Diener & Diener, 1996; Lachman et al., 2008), current levels of SWL remained stable over the (one-year) duration of the study. However, participants across all three CLA categories anticipated an increase in future SWL. Results indicated that CLA did not significantly moderate the concordance between predicted future life satisfaction and life satisfaction measured one year later. In other words, adversity (or lack thereof) was not associated with more accurate views of future flourishing. Previous research has demonstrated that people are moderately accurate when retrospectively assessing their personality change over time (Herbst et al., 2000; Luan et al., 2017; Oltmanns et al., 2020; Robins et al., 2005), but are less accurate when assessing changes in well-being (Frazier et al., 2009; Owenz et al., 2019; Yanez et al., 2011). This study extends previous research by revealing that a person's history of adversity does not necessarily lead to more accurate predictions of their future well-being.

These findings have several implications. First, these findings underscore the detrimental impact of early, childhood adversity as adverse childhood experiences were consistently associated with worse outcomes across both datasets. These findings further support the developmental impact of adversity and indicate that the adaptive function of moderate levels of CLA is contingent upon the developmental timing of adversity. Results also highlight the power of positive illusions surrounding representations of the

future as participants, regardless of their history of adversity, generally viewed life as getting better over time. Finally, the present findings suggest that adversity is not necessarily associated with more accurate or realistic views of the future but may prompt more inflated views of the future, which may serve as one method of coping with past adversities.

Limitations and Future Research

This research is not without limitations. One potential limitation concerns the analysis examining the concordance between subjective trajectories of SWL and current SWL trajectories measured over time. Due to the study design, I was not able to examine the accuracy of retrospective reports of past life satisfaction, only predictions of future SWL. Examining the concordance between perceptions of past change and measured changes from the past to present would provide a more comprehensive assessment of the accuracy of subjective trajectories of SWL. It would also provide greater insight into how people develop their life narratives by examining how they reconstruct their past.

A second potential limitation is the relatively short time between the intake survey and Week 45 and 52 surveys. Replicating the methodology from Lachman and colleagues (2008), which surveyed respondents over a period of 9 years, extending the time between measurements would allow the study to capture a greater number of potential life changes. It would also provide opportunity for further analysis of the stability in life satisfaction over time, as reported in previous studies (Diener & Diener, 1996; Lachman et al., 2008).

A third potential limitation of this longitudinal study is attrition from intake to Week 45 and 52. Specifically, of the 823 participants in the moderate CLA group at intake, 448

completed the Week 52 survey. This attrition in the sample could potentially skew results assessing the concordance between predicted SWL and SWL measured one year later and its relationship with the adaptive function of moderate levels of lifetime adversity.

Future research can build upon these findings in several ways. First, they can extend findings of the adaptive function of moderate CLA by examining if specific adversities facilitate greater resilience and provide more opportunity for growth post adversity. Additionally, future studies can explore if specific adversities limit the adaptive function of moderate levels of CLA. Additionally, they can build on these findings by examining what environmental and individual factors moderate the negative effects of lifetime and childhood adversity on future flourishing. Research has explored the many protective factors for adversity such as religious involvement, emotional reregulation and awareness, purpose, and optimism (Hamby et al., 2018), midlife generativity (Landes et al., 2014), and parental warmth (Masten & Tellegen, 2012). Future studies can build upon this research by examining protective factors of adversity that facilitate flourishing in later life.

Conclusion

The goal of this study was to extend previous research and further examine the adaptive function of moderate levels of CLA, the developmental impact of these adversities, as well as the effect of adversity on people's subjective trajectories of well-being and the accuracy of predicted future life satisfaction. Results indicate that there are developmental nuances to the adaptive function of moderate levels of CLA. Although those with moderate levels of CLA reported with slightly higher well-being outcomes at some of the measurement timepoints, in comparison to those with high levels of adversity

and a history of no adversity, these differences were not significant. However, early life adversity was consistently associated with incrementally worse outcomes in later life. Additionally, the present results indicated that regardless of the level of adversity people experience over their lifetime, they generally tend to see their current life as an improvement from the past and anticipate additional gains in the future, although the level of these increases varies based on the level of adversity experienced over time. Finally, these results also revealed that the level of adversity experienced in life does not necessarily translate to more accurate representations of future life satisfaction. This study further elucidates how people create and envision their life trajectories by retrospectively making sense of past tragedies and incorporating them into a coherent, optimistic future.

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APPENDIX A

Supplementary Information

Table A1

Demographic Information for each Survey Wave

	Week 1		Week 45		Week 52	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Female	51%		48.8%		49.5%	
Age	47.2	14.6	48.7	14	48.9	13.9
Household Income	\$54,970	\$43,395	\$55,966	\$43,783	\$56,1590	\$43,268
Education						
Bachelor's Degree or Higher	55%		50%		49.7%	
Other	45%		50%		49.8%	
Ethnicity						
White	71%		85%		85%	
Other	29%		15%		15%	

APPENDIX B

Cumulative Lifetime Adversity Measure

Seery, M. D., Holman, E. A., & Silver, R. C. (2010). Whatever does not kill us: cumulative lifetime adversity, vulnerability, and resilience. *Journal of Personality and Social Psychology*, 99(6), 1025-1041.

We would like to ask you about some events that may have happened to you during your lifetime. Please indicate whether an event has happened to you by **checking the box** next to each event description.

For every event you check:

- Please tell us the AGE you were when the event occurred.
- If the event occurred in a single year, please enter your AGE in the ‘Start Age’ box and leave the ‘End Age’ box blank.
- If the event is or was ongoing, please give us an age range (e.g., 14 to 17) in the ‘Start Age’ and ‘End Age’ boxes.
- If the event has happened to you more than once, please tell us **EACH** age when it happened using the boxes under “First Time,” “Second Time,” “Third Time,” and “Fourth Time.”

	Event	First Time			Second Time			Third Time			Fourth Time		
		Start Age	to	End Age	Start Age	to	End Age	Start Age	to	End Age	Start Age	to	End Age
☒	Example Event	14	to		20	to	33	35	to	39	42	to	
☐	Had someone touch or feel private areas of your body or touched/felt another's private areas under force or threat		to			to			to			to	
☐	Had sexual relations under force or threat		to			to			to			to	
☐	Had an unwanted pregnancy		to			to			to			to	
☐	Suffered a serious illness		to			to			to			to	
☐	Serious illness of a loved one		to			to			to			to	
☐	Witnessed someone being injured or killed		to			to			to			to	
☐	Witnessed family member injured or killed		to			to			to			to	
☐	Been coerced with threats of harm to yourself or your family		to			to			to			to	
☐	Experienced forced separation from family/children		to			to			to			to	

☐	Had combat experience		to			to			to			to	
☐	Death of your spouse/partner		to			to			to			to	
☐	Death of your mother		to			to			to			to	
☐	Death of your father		to			to			to			to	
☐	Death of your brother or sister		to			to			to			to	
☐	Death of your grandparent		to			to			to			to	
☐	Death of your child		to			to			to			to	
☐	Death of a friend		to			to			to			to	
☐	Lost someone close to you due to suicide. What relationship? _____		to			to			to			to	
☐	Lost someone close to you due to homicide. What relationship? _____		to			to			to			to	
☐	Got divorced yourself		to			to			to			to	
☐	Experienced your parents' divorce		to			to			to			to	

☐	Experienced serious financial difficulties (i.e., no money for food or shelter)		to			to			to			to	
☐	Experienced a major fire, flood, earthquake, or any natural disaster in your community		to			to			to			to	
☐	Suffered a <u>loss</u> in a major fire, flood, earthquake, or any natural disaster in your community		to			to			to			to	
☐	Experienced a tragedy or disaster in your community caused by people (a shooting, bombing, etc.)		to			to			to			to	
☐	Suffered a <u>loss</u> in a tragedy or disaster in your community caused by people (a shooting, bombing, etc.)		to			to			to			to	
☐	Lived in dangerous housing or neighborhood		to			to			to			to	
☐	Been discriminated against because of your ethnicity, religious background, or sexual orientation		to			to			to			to	
☐	Been exposed to dangerous chemicals or biological agents		to			to			to			to	
☐	Were neglected (as a child) by your parent(s)		to			to			to			to	
☐	Being physically harmed as a child (hit hard enough to leave a bruise or mark, kicked, burned, etc.)		to			to			to			to	

☐	Witnessed violence between your parents as a child		to			to			to			to	
☐	Been hit or pushed by your partner/spouse		to			to			to			to	
☐	Been shamed, embarrassed, or told repeatedly that you are “no good”		to			to			to			to	
☐	Had someone touch or feel private areas of your body or touched/felt another’s private areas under force or threat		to			to			to			to	
☐	Had sexual relations under force or threat		to			to			to			to	
☐	Had an unwanted pregnancy		to			to			to			to	
☐	Other event Specify: _____		to			to			to			to	
☐	Other event Specify: _____		to			to			to			to	

APPENDIX C

Brief Inventory of Thriving

Su, R., Tay, L., & Diener, E. (in press). The development and validation of Comprehensive Inventory of Thriving (CIT) and Brief Inventory of Thriving (BIT). *Applied Psychology: Health and Well-being*.

Please indicate your agreement or disagreement with each of the following statements using the scale below:

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Agree nor Disagree
- 4 Agree
- 5 Strongly Agree

- 1. My life has a clear sense of purpose
- 2. I am optimistic about my future
- 3. My life is going well
- 4. I feel good most of the time
- 5. What I do in life is valuable and worthwhile
- 6. I can succeed if I put my mind to it
- 7. I am achieving most of my goals
- 8. In most activities I do, I feel energized
- 9. There are people who appreciate me as a person
- 10. I feel a sense of belonging in my community

APPENDIX D

Temporal Satisfaction with Life Scale

Pavot, W., Diener, E., & Eunkook, S. (1998). The temporal satisfaction with life scale. *Journal of Personality Assessment*, 70, 340-355.

Below are 15 statements with which you may agree or disagree. These statements concern your past, present or future. Using the 1-7 scale below, indicate your agreement with each item. Please be open and honest in your responding. The 7-point scale is:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree

- _____ 1. If I had my past to live over, I would change nothing.
- _____ 2. I am satisfied with my life in the past.
- _____ 3. My life in the past was ideal for me.
- _____ 4. The conditions of my life in the past were excellent.
- _____ 5. I had the important things I wanted in my past.
- _____ 6. I would change nothing about my current life.
- _____ 7. I am satisfied with my current life.
- _____ 8. My current life is ideal for me.
- _____ 9. The current conditions of my life are excellent.
- _____ 10. I have the important things I want right now
- _____ 11. There will be nothing that I want to change about my future.
- _____ 12. I will be satisfied with my life in the future.
- _____ 13. I expect my future life will be ideal for me.
- _____ 14. The conditions of my future life will be excellent.
- _____ 15. I will have the important things I want in the future.

APPENDIX E

CES-Depression Questionnaire

Radloff, L. S. (1977). The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. *Applied Psychological Measurement*, 1, 385-402.

Everyone--no matter how happy they are--experiences depressive symptoms from time to time. This survey measures how many of those depressive symptoms you felt during the past week. Consider each question and select the answer that best describes how you have felt over the past week.

1	2	3	4
Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)

1. I was bothered by things that usually don't bother me.
2. I did not feel like eating; my appetite was poor.
3. I felt that I could not shake off the blues even with help from my family and friends.
4. I felt that I was just as good as other people.
5. I had trouble keeping my mind on what I was doing.
6. I felt depressed.
7. I felt that everything I did was an effort.
8. I felt hopeful about the future.
9. I thought my life had been a failure.
10. I felt fearful.
11. My sleep was restless.
12. I was happy.
13. I talked less than usual.
14. I felt lonely.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people disliked me.
20. I could not get "going."

APPENDIX F

Results from Transformed Data

Table F1

Descriptive statistics for transformed CLA and CCA

<i>Adversity Count</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>
CLA	8.99	6.74	0 – 31
CCA	2.75	3.12	0 – 14

Table F2

CLA category ranges

<i>Category</i>	<i>Zero</i>	<i>Moderate</i>	<i>High</i>
CLA Count	0	> 0 & ≤ 15.73	> 15.73
<i>n</i>	76	806	161

Table F3

Multiple Regression with Satisfaction with Life and Flourishing as Outcome Variables and Cumulative Lifetime Adversity (CLA) as the Predictor Variable, both Controlling and not Controlling for Depression

	<i>R²</i>	<i>F</i>	<i>β</i>	<i>SE_β</i>	<i>T value</i>	<i>p-value</i>
Satisfaction with Life (Week 1)	.29	50.29				<.001
CLA	.29		-0.01	0.02	0.13	.898
CLA ²			-0.01	0.00	-0.79	.430
Depression			-1.32	0.08	-16.10	<.001
Satisfaction with Life (Week 1)	.10	16.19				<.001
CLA			-0.02	0.02	-0.97	.330
CLA ²			-0.01	0.00	-1.20	.215
Flourishing (Week 1)	.48	11.49				<.001
CLA			0.02	0.01	2.32	.021
CLA ²			-0.01	0.01	-2.20	.030
Depression			-0.95	0.04	-26.90	<.001
Flourishing (Week 1)	.10	16.28				<.001
CLA			0.01	0.01	0.18	.861
CLA ²			-0.01	0.00	-2.04	.018

Table F3, cont.

Multiple Regression with Satisfaction with Life and Flourishing As Outcome Variables and Cumulative Lifetime Adversity (CLA) as The Predictor Variable, Both Controlling and Not Controlling for Depression Using Transformed Data

	R^2	F	β	SE_{β}	T value	p value
Satisfaction with Life (Week 45)	.33	35.64				<.001
<i>CLA</i>			-0.06	0.02	-2.62	.009
<i>CLA</i> ²			0.01	0.01	2.49	.013
<i>Depression</i>			-1.41	0.10	-13.88	<.001
Satisfaction with Life (Week 45)	.10	9.92				<.001
<i>CLA</i>			-0.08	0.03	-2.94	.003
<i>CLA</i> ²			0.01	0.01	1.47	.141
Flourishing (Week 45)	.29	39.61				<.001
<i>CLA</i>			-0.01	0.01	-0.46	.647
<i>CLA</i> ²			0.01	0.01	1.15	.252
<i>Depression</i>			-0.82	0.05	-15.83	<.001
Flourishing (Week 45)	.07	6.80				<.001
<i>CLA</i>			-0.02	0.15	-1.09	.277
<i>CLA</i> ²			0.01	0.01	0.20	.839
Satisfaction with Life (Week 52)	.28	27.24				<.001
<i>CLA</i>			-0.05	0.03	-1.99	.047
<i>CLA</i> ²			0.01	0.01	1.98	.049
<i>Depression</i>			-1.25	0.11	-11.90	<.001
Satisfaction with Life (Week 52)	.10	8.64				<.001
<i>CLA</i>			-0.06	0.02	-2.00	.046
<i>CLA</i> ²			0.06	0.03	0.85	.400
Flourishing (Week 52)	.34	35.63				<.001
<i>CLA</i>			0.01	0.01	0.05	.957
<i>CLA</i> ²			0.01	0.01	0.33	.742
<i>Depression</i>			-0.76	0.05	-14.77	<.001
Flourishing (Week 52)	.08	6.83				<.001
<i>CLA</i>			0.01	0.01	-0.18	.856
<i>CLA</i> ²			-0.01	0.01	-0.83	.405

Table F4

Multiple Regression with Satisfaction with Life and Flourishing as Outcome Variables and Cumulative Childhood Adversity (CCA) as The Predictor Variable, Both Controlling and Not for Depression

	R^2	F	β	SE_{β}	T value	p value
Satisfaction with Life (Week 1)	.29	57				<.001
CCA			0.01	-0.01	-0.96	.338
Depression			0.08	-1.35	-16.58	<.001
Satisfaction with Life (Week 1)	.09	16.14				<.001
CCA			-0.08	-0.08	-5.15	<.001
Flourishing (Week 1)	.48	130.3				<.001
CCA			0.01	0.01	1.04	.298
Depression			0.04	-0.96	-27.34	<.001
Flourishing (Week 1)	.09	15.72				<.001
CCA			-0.01	-0.04	-4.97	<.001
Satisfaction with Life (Week 45)	.32	39.36				<.001
CCA			0.02	-0.01	-.044	.967
Depression			0.10	-1.42	-14.02	<.001
Satisfaction with Life (Week 45)	.09	9.9				<.001
CCA			-0.08	-0.08	-3.63	<.001
Flourishing (Week 45)	.35	45.43				<.001
CCA			0.01	0.02	1.97	.049
Depression			0.05	-0.82	-15.93	<.001
Flourishing (Week 45)	.07	7.50				<.001
CCA			-0.01	-0.02	-2.16	.031
Satisfaction with Life (Week 52)	.28	30.46				<.001
CCA			0.02	0.01	0.63	.526
Depression			0.11	-1.26	-12.08	<.001

Table F4, cont.

*Multiple Regression with Satisfaction with Life and Flourishing as Outcome Variables
Cumulative Childhood Adversity (CCA) as the Predictor Variable both Controlling for
and Not Controlling for Depression*

	R^2	F	β	SE_{β}	T value	p value
Satisfaction with Life (Week 52)	.09	8.8				<.001
CCA			-0.05	-0.05	-2.52	.012
Flourishing (Week 52)	.34	41.06				<.001
CCA			0.01	0.01	1.51	.121
Depression			0.05	-0.76	-15.02	<.001
Flourishing (Week 52)	.08	7.48				<.001
CCA			0.01	-0.02	-2.27	.024

Research Question 2: ANOVA Results

Results from the ANOVA revealed a significant main effect for CLA category $F(2, 1037) = 24.05, p < .001$ and for Temporal Rating $F(2.89, 1956.45) = 72.72, p < .001$. The CLA Category X Temporal Rating interaction, $F(3.77, 1956.97) = 7.53, p < .001$, was also significant.

Figure F1

Subjective Trajectories of Satisfaction with Life by CLA Category

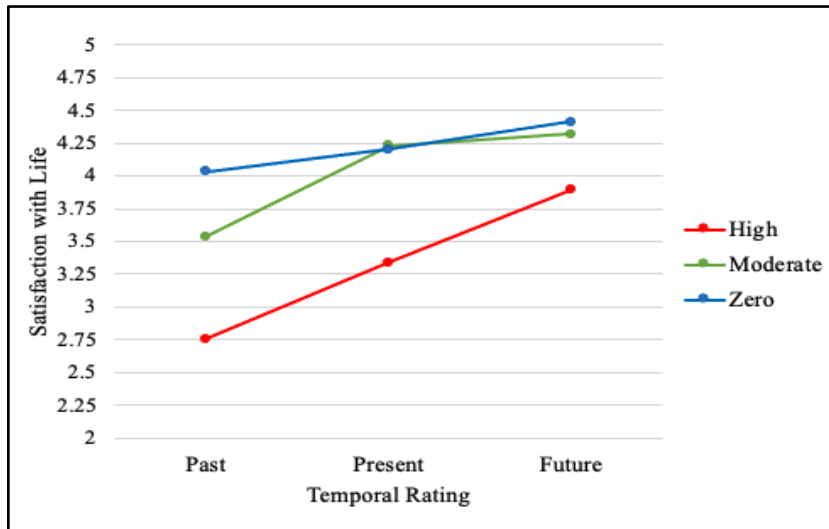


Table F5

Reported Satisfaction with Life (SWL) for each Cumulative Lifetime Adversity (CLA) Category at each Temporal Rating

CLA Category	Temporal Rating	M_{SWL}	SD_{SWL}	n
High	Past	2.76	1.36	161
	Present	3.34	1.64	
	Future	3.89	1.46	
Moderate	Past	3.54	1.44	805
	Present	4.23	1.59	
	Future	4.32	1.27	
Zero	Past	4.03	1.43	74
	Present	4.20	1.54	
	Future	4.41	1.41	

Note. M = mean, SD = standard deviation

Main effect of CLA Category

To further examine the main effect of CLA category, I conducted a one-way ANOVA comparing each category's score (high, moderate and zero) at each temporal rating (past, present and future). Results indicated a significant effect of CLA category for all three Temporal Ratings: Past $F(2, 1037) = 26.43$ $p < .001$; Present $F(2, 1037) =$

21.64, $p < .001$; and Future $F(2, 1038) = 7.68$, $p < .001$. I conducted Bonferroni tests to examine mean differences in SWL scores between the CLA categories at each Temporal Rating.

Table F6

Results Comparing Satisfaction with Life (SWL) Means between Cumulative Lifetime Adversity (CLA) Category at each Temporal Rating

<i>Temporal Rating</i>	<i>CLA Category</i>	<i>p adj.</i>
Past	High vs. Moderate	< .0001
	High vs. Zero	< .0001
	Moderate vs. Zero	.044
Present	High vs. Moderate	< .0001
	High vs. Zero	.001
	Moderate vs. Zero	.086
Future	High vs. Moderate	.002
	High vs. Zero	.005
	Moderate vs. Zero	.589

Main effect of Temporal Category

To further examine the main effect of Temporal Category on SWL, I ran a one-way ANOVA. Results indicated a significant effect of Temporal Category on each CLA category: High: $F(2, 305) = 48.03$ $p < .001$; Moderate: $F(2, 1541) = 173.70$, $p < .001$; Zero: $F(2, 125) = 3.78$ $p < .001$ I conducted Bonferroni tests to examine mean differences in SWL between the Temporal Ratings for each CLA category. See table F7 below for results.

Table F7

Results comparing Satisfaction with Life (SWL) means between each Temporal Rating for each Cumulative Lifetime Adversity (CLA) category

<i>CLA Category</i>	<i>Temporal Rating</i>	<i>p adj.</i>
High	Past vs Present	< .0001
	Past vs. Future	< .0001
	Present vs. Future	< .0001
Moderate	Past vs. Present	< .0001
	Past vs. Future	< .0001
	Present vs. Future	.070
Zero	Past vs. Present	.702
	Past vs. Future	.060
	Present vs. Future	.180

Table F8

Multiple Regression Results Examining the Interaction between Predicted Future Satisfaction and Cumulative Lifetime Adversity Both Controlling and Not Controlling for Depression

	<i>R²</i>	<i>F</i>	<i>β</i>	<i>SE β</i>	<i>T value</i>	<i>p-value</i>
Satisfaction with Life (Week 45)	.47	57.18				<.001
<i>CLA</i>			0.16	0.02	0.76	.44
<i>Predicted SWL (FSWL)</i>			0.56	0.06	9.35	<.001
<i>Interaction</i>			-0.01	0.01	-1.10	.29
<i>Depression</i>			-0.83	0.10	-8.12	<.001
Satisfaction with Life (Week 45)	.41	50.68				<.001
<i>CLA</i>			-0.01	0.02	-0.86	.39
<i>Predicted SWL (FSWL)</i>			0.68	0.57	12.09	<.001
<i>Interaction</i>			-0.01	0.01	-0.504	.615
Satisfaction with Life (Week 52)	.43	45.69				<.001
<i>CLA</i>			0.03	0.02	1.24	0.21
<i>Predicted SWL (FSWL)</i>			0.57	0.06	9.02	<.001
<i>Interaction</i>			-0.07	0.01	-1.39	0.16
<i>Depression</i>			-0.72	0.11	-1.43	<.001
Satisfaction with Life (Week 52)	.38	42.05				<.001
<i>CLA</i>			-0.01	0.02	-0.05	.96
<i>Predicted SWL (FSWL)</i>			0.66	0.06	10.31	<.001
<i>Interaction</i>			-0.01	0.01	-0.87	.51

APPENDIX G

R Code

Untransformed Data

```
library(tidyverse)
library(tidymodels)
library(ggplot2)
library(haven)
library(broom)
library(dplyr)
library(openintro)
library(rstatix)
library(plyr)
library(stats)
library(psych)
Master_data <- read_sav("~/Documents/Grad School/Grad School Fall
2020/Research/Data/Thesis data/Master_merged_9_Sept_no_zero.sav")
View(Master_data)
SWL_data <- read_sav("~/Documents/Grad School/Grad School Fall
2020/Research/Data/Thesis data/Master_longSWL_nozeros.sav")
View(SWL_data)

# Create CLA categories in Master Data file (1 SD above the mean)
SWL_data <- SWL_data %>%
  mutate(CLA_category = case_when(SUM_CLA == 0 ~ "Zero",
    SUM_CLA < 16.29 ~ "Moderate",
    SUM_CLA >= 16.29 ~ "High"))
Master_data <- Master_data %>%
  mutate(CLA_category = case_when(SUM_CLA == 0 ~ "Zero",
    SUM_CLA < 16.29 ~ "Moderate",
    SUM_CLA >= 16.29 ~ "High"))
```

Question 1a

```
# create a new variable for CLA2
Master_data$SUM_CLA2 <- Master_data$SUM_CLA^2

# CLA and Present SWL
quadraticModel_SWL_CLA_Cov <- lm(TSWL_PRESENT_MEAN ~ SUM_CLA +
  SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2 +
  CESD_SCORE_MEAN_Wk1, data=Master_data)
summary(quadraticModel_SWL_CLA_Cov)
```

```

quadraticModel_SWL_CLA_Cov_noCESD <- lm(TSWL_PRESENT_MEAN ~
SUM_CLA + SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2,
data=Master_data)
summary(quadraticModel_SWL_CLA_Cov_noCESD)

## Week 45
quadraticModel_SWL_CLA_Cov_Wk45 <- lm(SWL_Wk45_Mean ~ SUM_CLA +
SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2 +
CESD_SCORE_MEAN_Wk1, data=Master_data)
summary(quadraticModel_SWL_CLA_Cov_Wk45)

# Week 45 w/o depression
quadraticModel_SWL_CLA_Cov_noCESD_Wk45 <- lm(SWL_Wk45_Mean ~
SUM_CLA + SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2,
data=Master_data)
summary(quadraticModel_SWL_CLA_Cov_noCESD_Wk45)

## Week 52
quadraticModel_SWL_CLA_Cov_Wk52 <- lm(SWL_Wk52_Mean ~ SUM_CLA +
SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2 +
CESD_SCORE_MEAN_Wk1, data=Master_data)
summary(quadraticModel_SWL_CLA_Cov_Wk52)

# CLA and SWL w/o depression
quadraticModel_SWL_CLA_Cov_noCESD_Wk52 <- lm(SWL_Wk52_Mean ~
SUM_CLA + SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2,
data=Master_data)
summary(quadraticModel_SWL_CLA_Cov_noCESD_Wk52)

##### EWB

# Week 1 CLA and EWB
quadraticModel_CLA_Cov <- lm(BIT_Wk1_Mean ~ SUM_CLA + SUM_CLA2 + Age
+ Sex_2 + School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data)
summary(quadraticModel_CLA_Cov)

# CLA and EWB without Depression
quadraticModel_CLA_noCESD <- lm(BIT_Wk1_Mean ~ SUM_CLA + SUM_CLA2 +
Age + Sex_2 + School_2 + Income_2 + Race_2, data=Master_data)
summary(quadraticModel_CLA_noCESD)

## Week 45
quadraticModel_CLA_Cov_45 <- lm(BIT_Wk45_Mean ~ SUM_CLA + SUM_CLA2 +
Age + Sex_2 + School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data)

```

```
summary(quadraticModel_CLA_Cov_45)
```

```
# CLA and EWB without Depression
```

```
quadraticModel_CLA_noCESD_45 <- lm(BIT_Wk45_Mean ~ SUM_CLA +  
SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2, data=Master_data)  
summary(quadraticModel_CLA_noCESD_45)
```

```
## Week 52
```

```
quadraticModel_CLA_Cov_52 <- lm(BIT_Wk52_Mean ~ SUM_CLA + SUM_CLA2 +  
Age + Sex_2 + School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,  
data=Master_data)  
summary(quadraticModel_CLA_Cov_52)
```

```
# CLA and EWB without Depression
```

```
quadraticModel_CLA_noCESD_52 <- lm(BIT_Wk52_Mean ~ SUM_CLA +  
SUM_CLA2 + Age + Sex_2 + School_2 + Income_2 + Race_2, data=Master_data)  
summary(quadraticModel_CLA_noCESD_52)
```

Predicted Values

```
#Set all possible values of CLA from 1 to 70
```

```
CLA <- 1:17
```

```
#Coefficients are taken from the table corresponding to Model 1a_1
```

```
b0 <- -6.216e00
```

```
b1 <- -1.061e-02 #CLA
```

```
b2 <- -1.373e-05 #CLA2
```

```
b3 <- -4.755e-03 #age
```

```
b4 <- 2.731e-02 #gender
```

```
b5 <- -1.322e+00 #depression
```

```
b6 <- -2.033e-02 #school
```

```
b7 <- 5.133e-01 #income
```

```
b8 <- 2.157e-01 #race
```

```
#Calculating predicted values
```

```
pred.vals_SWL <- b0 +
```

```
  b1*CLA +
```

```
  b2*(CLA^2) +
```

```
  b3*47.19 + #age
```

```
  b4*0.503 + #gender
```

```
  b5*1.71 + #depression
```

```
  b6*0.55 + #education
```

```
  b7*6.09 + #income
```

```
  b8*0.708 #race
```

```
plot(CLA, pred.vals_SWL, type = "l", ylim = c(0, 7) , ylab = "Predicted SWL")
```

```
plot(CLA, pred.vals_SWL, type = "l", ylab = "Predicted SWL")
vi
```

```
# EWB: CLA
#Set all possible values of CLA from 1 to 70
CLA <- 1:70
```

```
#Coefficients are taken from the table corresponding to Model 1b_1
b0_b <- 5.199e00
b1_b <- 6.825e-03 #CLA
b2_b <- -1.373e-04 #CLA^2
b3_b <- -3.765e-03 #age
b4_b <- 5.992e-02 #gender
b5_b <- -9.565e-01 #depression
b6_b <- 4.080e-02 #school
b7_b <- 1.597e-06 #income
b8_b <- -3.183e-02 #race
```

```
#Calculating predicted values
pred.vals_EWB <- b0 +
  b1_b*CLA +
  b2_b*(CLA^2) +
  b3_b*47.19 + #age
  b4_b*0.503 + #gender
  b5_b*1.71 + #depression
  b6_b*0.55 + #education
  b7_b*6.09 + #income
  b8_b*0.708 #race
```

```
plot(CLA, pred.vals_EWB, type = "l", ylab = "Predicted EWB")
plot(CLA, pred.vals_EWB, type = "l", ylim= c(3,5), ylab = "Predicted EWB")
```

```
# SWL and ACE
SWL_ACE <- lm(TSWL_PRESENT_MEAN ~ SUM_ACE + Age + Sex_2 + Income_2
+ School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)
summary(SWL_ACE) # show results
```

```
# SWL and ACE (w/o depression)
SWL_ACE_noCESD <- lm(TSWL_PRESENT_MEAN ~ SUM_ACE + Age + Sex_2 +
Income_2 + School_2 + Race_2, data=Master_data)
summary(SWL_ACE_noCESD) # show results
```

```
# Week 45
SWL_ACE_45 <- lm(SWL_Wk45_Mean ~ SUM_ACE + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)
```

```

summary(SWL_ACE_45) # show results

# SWL and ACE (w/o depression)
SWL_ACE_noCESD_45 <- lm(SWL_Wk45_Mean ~ SUM_ACE + Age + Sex_2 +
Income_2 + School_2 + Race_2, data=Master_data)
summary(SWL_ACE_noCESD_45) # show results

# Week 52
SWL_ACE_52 <- lm(SWL_Wk52_Mean ~ SUM_ACE + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)
summary(SWL_ACE_52) # show results

# SWL and ACE (w/o depression)
SWL_ACE_noCESD_52 <- lm(SWL_Wk52_Mean ~ SUM_ACE + Age + Sex_2 +
Income_2 + School_2 + Race_2, data=Master_data)
summary(SWL_ACE_noCESD_52) # show results

# EWB and ACE:

# Week 1
ACE_EWB <- lm(BIT_Wk1_Mean ~ SUM_ACE + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)
summary (ACE_EWB) # show results

# EWB and ACE (w/o Depression)
ACE_EWB_noCESD <- lm(BIT_Wk1_Mean ~ SUM_ACE + Age + Sex_2 + Income_2
+ School_2 + Race_2, data=Master_data)
summary(ACE_EWB_noCESD) # show results

# Week 45
ACE_EWB_45 <- lm(BIT_Wk45_Mean ~ SUM_ACE + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)
summary (ACE_EWB_45) # show results

# EWB and ACE (w/o Depression)
ACE_EWB_noCESD_45 <- lm(BIT_Wk45_Mean ~ SUM_ACE + Age + Sex_2 +
Income_2 + School_2 + Race_2, data=Master_data)
summary(ACE_EWB_noCESD_45) # show results

# Week 52
ACE_EWB_52 <- lm(BIT_Wk52_Mean ~ SUM_ACE + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)
summary (ACE_EWB_52) # show results

# EWB and ACE (w/o Depression)

```

```
ACE_EWB_noCESD_52 <- lm(BIT_Wk52_Mean ~ SUM_ACE + Age + Sex_2 +
Income_2 + School_2 + Race_2, data=Master_data)
summary(ACE_EWB_noCESD_52) # show results
```

Question 2

1. Create CLA 3x categories: 3x (zero, moderate, high)

```
Master_data<- Master_data %>%
  mutate(CLA_cat = case_when(SUM_CLA == 0 ~ "Zero",
                             SUM_CLA <16.29 ~ "Moderate",
                             SUM_CLA >=16.29 ~ "High"))
```

```
SWL_data<- SWL_data %>%
  mutate(CLA_category = case_when(SUM_CLA == 0 ~ "Zero",
                                   SUM_CLA <16.29 ~ "Moderate",
                                   SUM_CLA >=16.29 ~ "High"))
```

Summary of SWL Grouped by Time

```
summary <-SWL_data %>%
group_by(Time) %>%
get_summary_stats(SWL, type = "mean_sd")
data.frame(summary)
view(summary)
```

Summary of SWL Grouped by CLA

```
summary2 <-SWL_data %>%
group_by(CLA_category) %>%
get_summary_stats(SWL, type = "mean_sd")
data.frame(summary2)
view(summary2)
```

Summary of SWL Grouped by CLA and Time

```
summary3 <-SWL_data %>%
group_by(CLA_category,Time) %>%
get_summary_stats(SWL, type = "mean_sd")
data.frame(summary3)
view(summary3)
```

Plot data

SWL @ three time points; grouped by CLA Category

```
ggplot(SWL_data, aes(x=Time, y=SWL, fill=CLA_category)) +
  geom_boxplot() +
  theme(axis.text.x = element_blank()) +
  facet_wrap(~Time, scale="free", labeller = label_both,
```

```

Time.labs <- c("1", "2", "3"),
names(Time.labs) <- c("Past", "Present", "2"))

##### Plot subjective trajectories

# Subjective trajectory, not grouped
ggplot(data=summary, aes(x=Time, y=mean)) +
  geom_line() +
  geom_point()

# Subjective trajectory, grouped by CLA >>> Set ylim to (0,7) range
ggplot(data=summary3, aes(x=Time, y=mean, color=CLA_category)) +
  geom_line()+
  ggtitle("Subjective Trajectories of Life Satisfaction") +
  theme(plot.title = element_text(hjust = 0.5)) +
  xlab("Time") + ylab("SWL") + scale_x_discrete(name = "Time", {ylim=(0,7)} # error
here +
      limits=c("1"="Past", "2" = "Present", "3" = "Future")) +
  geom_point()

## ANOVA models

# ANOVA assessing retrospective past, reported present and predicted future SWL based
on CLA levels (zero, moderate, high)
# Within: Time (past, present, future)
# Between: CLA Category (zero, moderate, high)
# Outcome/DV: SWL (continuous)

#STEP 1: Two-way mixed ANOVA test
mix.aov <- anova_test(
  data = SWL_data, dv = SWL, wid = ImportIdRespondent,
  between = CLA_cat, within = Time
)
get_anova_table(mix.aov)
# Results: Significant two-way interaction

# STEP 2: Effect of group at each time point
one.way1 <- SWL_data %>%
  group_by(Time) %>%
  anova_test(dv = SWL, wid = ImportIdRespondent, between = CLA_category) %>%
  get_anova_table() %>%
  adjust_pvalue(method = "bonferroni")
one.way1

```

```

# STEP 2b: Pairwise comparisons between categories
pwc1 <- SWL_data %>%
  group_by(Time) %>%
  pairwise_t_test(SWL ~ CLA_category, p.adjust.method = "bonferroni")
pwc1

# STEP 3: Effect of time at each category level

      # Create new dataframe, omit those with NA value for CLA category
      SWL_data_CLA<- SWL_data[!is.na(SWL_data$CLA_category), ]
      view(SWL_data_CLA)

one.way2 <- SWL_data_CLA %>%
  group_by(CLA_category) %>%
  anova_test(dv = SWL, wid = ImportIdRespondent, within = Time) %>%
  get_anova_table() %>%
  adjust_pvalue(method = "bonferroni")
one.way2

# Repeated measures ANOVA shows an effect
model_rm <- aov(SWL~factor(CLA_category)+Error(factor(ImportIdRespondent)), data
= SWL_data)
summary(model_rm)

df_zero = SWL_data[(Master_data['CLA_category'] ~ 'Zero')]
df_zero<- SWL_data %>%
  SWL_data[SWL_data$CLA_category == 'Zero']
view(df_zero)

# Two way repeated measures ANOVA
res.aov <- anova_test(
  data = SWL_data_CLA, dv= SWL , wid = ImportIdRespondent,
  within = c(CLA_category,Time)
)
get_anova_table(res.aov)

#Step 3b: Pairwise comparisons between time points at each category levels

pwc2 <- SWL_data_CLA %>%
  group_by(CLA_category) %>%
  pairwise_t_test(
    SWL ~ Time, paired = TRUE,
    p.adjust.method = "bonferroni"
  ) %>%
  select(-df, -statistic, -p) # Remove details

```

pwc2

Question 3

```
model_3 <- lm(SWL_Wk45_Mean~ TSWL_FUTURE_MEAN + SUM_CLA +  
(TSWL_FUTURE_MEAN * SUM_CLA) + Age + Sex_2 + Income_2 + School_2 +  
Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)  
summary(model_3) # show results
```

```
model_3_noCESD <- lm(SWL_Wk45_Mean~ TSWL_FUTURE_MEAN + SUM_CLA  
+ (TSWL_FUTURE_MEAN * SUM_CLA) + Age + Sex_2 + Income_2 + School_2 +  
Race_2, data=Master_data)  
summary(model_3_noCESD) # show results
```

```
model_3b <- lm(SWL_Wk52_Mean~ TSWL_FUTURE_MEAN + SUM_CLA +  
(TSWL_FUTURE_MEAN * SUM_CLA) + Age + Sex_2 + Income_2 + School_2 +  
Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data)  
summary(model_3b) # show results
```

```
model_3b_noCESD <- lm(SWL_Wk52_Mean~ TSWL_FUTURE_MEAN + SUM_CLA  
+ (TSWL_FUTURE_MEAN * SUM_CLA) + Age + Sex_2 + Income_2 + School_2 +  
Race_2, data=Master_data)  
summary(model_3b_noCESD) # show results
```

Transformed Data

```
library(tidyverse)  
library(tidymodels)  
library(ggplot2)  
library(haven)  
library(broom)  
library(dplyr)  
library(openintro)  
library(rstatix)  
library(plyr)  
library(stats)  
library(psych)  
Master_data <- read_sav("~/Documents/Grad School/Grad School Fall  
2020/Research/Data/Thesis data/Master_merged_9_Sept_no_zero.sav")  
View(Master_data)  
SWL_data <- read_sav("~/Documents/Grad School/Grad School Fall  
2020/Research/Data/Thesis data/Master_longSWL_nozeros.sav")  
View(SWL_data)  
count(Master_data$SUM_CLA)
```

```

Master_data -> Master_data_transf
describe(Master_data$SUM_CLA)
count(Master_data$SUM_CLA)
# How many extreme scores? 9 for CLA (above 31).
P1 <- 100 * length(which(Master_data$SUM_CLA > 31)) /
length((Master_data$SUM_CLA))
P1

```

```

#Extreme scores = 3 SD (7.2) above and below the mean (9.09)
# 7.2 * 3 + 9.09 = 30.69

```

```

# Set extreme values to 31 (CLA): create new variable (CLA_31), which is the "capped"
value @ 31 for CLA
Master_data_transf <- Master_data_transf %>%
  mutate(CLA_31 = case_when(SUM_CLA > 31 ~ 31,
    SUM_CLA <= 31 ~ SUM_CLA))

```

```

# Categorize CLA, 1 SD above mean = "high". 1 Sd (6.74) above the mean (8.99) =
15.73
Master_data_transf <- Master_data_transf %>%
  mutate(CLA_31_cat = case_when(SUM_CLA == 0 ~ "Zero",
    SUM_CLA < 15.73 ~ "Moderate",
    SUM_CLA >= 15.73 ~ "High"))
count(Master_data_transf$CLA_31_cat)

```

```

scatter.smooth(Master_data$CLA_31, Master_data$BIT_Wk1_Mean, pch=16)

```

Question 1a

```

# create a new variable for CLA2
Master_data_transf$CLA_31_2 <- Master_data_transf$CLA_31^2

```

```

# CLA and SWL
SWL_CLA_31_Cov <- lm(TSWL_PRESENT_MEAN ~ CLA_31 + CLA_31_2 + Age +
Sex_2 + School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data_transf)
summary(SWL_CLA_31_Cov)

```

```

# CLA and SWL (without Depression)
SWL_CLA_31_Cov_noCESD <- lm(TSWL_PRESENT_MEAN ~ CLA_31 + CLA_31_2
+ Age + Sex_2 + School_2 + Income_2 + Race_2, data=Master_data_transf)
summary(SWL_CLA_31_Cov_noCESD)

```

```

# Week 45
SWL_CLA_31_Cov_45 <- lm(SWL_Wk45_Mean ~ CLA_31 + CLA_31_2 + Age +
Sex_2 + School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data_transf)
summary(SWL_CLA_31_Cov_45)

# Cla and SWL (without Depression)
SWL_CLA_31_Cov_noCESD_45 <- lm(SWL_Wk45_Mean ~ CLA_31 + CLA_31_2 +
Age + Sex_2 + School_2 + Income_2 + Race_2, data=Master_data_transf)
summary(SWL_CLA_31_Cov_noCESD_45)

# Week 52
SWL_CLA_31_Cov_52 <- lm(SWL_Wk52_Mean ~ CLA_31 + CLA_31_2 + Age +
Sex_2 + School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data_transf)
summary(SWL_CLA_31_Cov_52)

# Cla and SWL (without Depression)
SWL_CLA_31_Cov_noCESD_52 <- lm(SWL_Wk52_Mean ~ CLA_31 + CLA_31_2 +
Age + Sex_2 + School_2 + Income_2 + Race_2, data=Master_data_transf)
summary(SWL_CLA_31_Cov_noCESD_52)

# Week 1: CLA and EWB
CLA_Cov_31 <- lm(BIT_Wk1_Mean ~ CLA_31 + CLA_31_2 + Age + Sex_2 +
School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data_transf)
summary(CLA_Cov_31)

# Week 1: CLA and EWB (without Depression)
CLA_Cov_31_noCESD <- lm(BIT_Wk1_Mean ~ CLA_31 + CLA_31_2 + Age + Sex_2
+ School_2 + Income_2 + Race_2, data=Master_data_transf)
summary(CLA_Cov_31_noCESD)

# Week 45: CLA and EWB
CLA_Cov_31_45 <- lm(BIT_Wk45_Mean ~ CLA_31 + CLA_31_2 + Age + Sex_2 +
School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data_transf)
summary(CLA_Cov_31_45)

# Week 45: CLA and EWB (without Depression)
CLA_Cov_31_noCESD_45 <- lm(BIT_Wk45_Mean ~ CLA_31 + CLA_31_2 + Age +
Sex_2 + School_2 + Income_2 + Race_2, data=Master_data_transf)
summary(CLA_Cov_31_noCESD_45)

# Week 52: CLA and EWB

```

```

CLA_Cov_31_52 <- lm(BIT_Wk52_Mean ~ CLA_31 + CLA_31_2 + Age + Sex_2 +
School_2 + Income_2 + Race_2 + CESD_SCORE_MEAN_Wk1,
data=Master_data_transf)
summary(CLA_Cov_31_52)

# Week 52: CLA and EWB (without Depression)
CLA_Cov_31_noCESD_52 <- lm(BIT_Wk52_Mean ~ CLA_31 + CLA_31_2 + Age +
Sex_2 + School_2 + Income_2 + Race_2, data=Master_data_transf)
summary(CLA_Cov_31_noCESD_52)

```

Predicted Values

```

# SWL: CLA
#Set all possible values of CLA from 1 to 60
CLA <- 1:60

# Coefficients are taken from the table corresponding to Model 1b_1
# Change these based on transformed scores
b0_b <- 5.199e00
b1_b <- 6.825e-03 #CLA
b2_b <- -1.373e-04 #CLA^2
b3_b <- -3.765e-03 #age
b4_b <- 5.992e-02 #gender
b5_b <- -9.565e-01 #depression
b6_b <- 4.080e-02 #school
b7_b <- 1.597e-06 #income
b8_b <- -3.183e-02 #race

#Calculating predicted values
pred.vals_SWL <- b0 +
  b1_b*CLA +
  b2_b*(CLA^2) +
  b3_b*47.19 + #age
  b4_b*0.503 + #gender
  b5_b*1.71 + #depression
  b6_b*0.55 + #education
  b7_b*6.09 + #income
  b8_b*0.708 #race

#Now plot predicted values against cumulative lifetime adversity
plot(CLA, pred.vals_SWL, type = "l", ylim= c(4,5), ylab = "Predicted SWL", xlab =
"Cumulative Lifetime Adversity")
plot(CLA, pred.vals_SWL, type = "l", ylab = "Predicted SWL", xlab = "Cumulative
Lifetime Adversity")

view(pred.vals_SWL)

```

```

#EWB:CLA
#Set all possible values of CLA from 1 to 60
CLA <- 1:60

#Coefficients are taken from the table corresponding to Model 1a_1
# Change these based on the transformed score
b0 <- 5.240e00
b1 <- 1.996e-02 #CLA
b2 <- -6.856e-04 #CLA2
b3 <- -4.266e-03 #age
b4 <- 5.970e-02 #gender
b5 <- -9.534e-01 #depression
b6 <- 4.332e-02 #school
b7 <- 1.610e-06 #income
b8 <- -2.898e-01 #race

#Calculating predicted values
#Note that CLA can take multiple values (ranging from 1 to 60) but everything else is set
at its mean
pred.vals_EWB_transformed <- b0 +
  b1*CLA +
  b2*(CLA^2) +
  b3*47.19 + #age
  b4*0.503 + #gender
  b5*1.71 + #depression
  b6*0.55 + #education
  b7*6.09 + #income
  b8*0.708 #race

#Now plot predicted values against cumulative lifetime adversity
plot(CLA, pred.vals_EWB_transformed, type = "l", ylim = c(2,4), ylab = "Predicted
EWB", xlab = "Cumulative Lifetime Adversity")
plot(CLA, pred.vals_EWB_transformed, type = "l", ylab = "Predicted EWB", xlab =
"Cumulative Lifetime Adversity")
view(pred.vals_EWB_transformed)

```

Question 1b

```

# Data Analysis
describe(Master_data_transf$SUM_ACE)
# Mean = 2.84
# SD = 3.61

#Extreme scores = 3 SD (3.61) above and below the mean (2.84)
3.61 * 3 + 2.84 = 13.67

```

```

# Set extreme values to 14
Master_data_transf<- Master_data_transf %>%
  mutate(ACE_14 = case_when(SUM_ACE> 14 ~ 14,
    SUM_ACE <= 14 ~ SUM_ACE))

# SWL and ACE
SWL_ACE_14 <- lm(TSWL_PRESENT_MEAN ~ ACE_14 + Age + Sex_2 + Income_2
+ Race_2 + School_2 + CESD_SCORE_MEAN_Wk1, data=Master_data_transf)
summary(SWL_ACE) # show results

# Without Depression
SWL_ACE_14_noCESD <- lm(TSWL_PRESENT_MEAN ~ ACE_14 + Age + Sex_2 +
Race_2 + Income_2 + School_2, data=Master_data_transf)
summary(SWL_ACE_14_noCESD) # show results

# Week 45
SWL_ACE_14_45 <- lm(SWL_Wk45_Mean~ ACE_14 + Age + Sex_2 + Income_2 +
Race_2 + School_2 + CESD_SCORE_MEAN_Wk1, data=Master_data_transf)
summary(SWL_ACE_14_45) # show results

# Without Depression
SWL_ACE_14_noCESD_45 <- lm(SWL_Wk45_Mean ~ ACE_14 + Age + Sex_2 +
Race_2 + Income_2 + School_2, data=Master_data_transf)
summary(SWL_ACE_14_noCESD_45) # show results

# Week 52
SWL_ACE_14_52 <- lm(SWL_Wk52_Mean ~ ACE_14 + Age + Sex_2 + Income_2 +
Race_2 + School_2 + CESD_SCORE_MEAN_Wk1, data=Master_data_transf)
summary(SWL_ACE_14_52) # show results

# Without Depression
SWL_ACE_14_noCESD <- lm(SWL_Wk52_Mean ~ ACE_14 + Age + Sex_2 + Race_2
+ Income_2 + School_2, data=Master_data_transf)
summary(SWL_ACE_14_noCESD) # show results

# EWB and ACE:
ACE_14_EWB <- lm(BIT_Wk1_Mean ~ ACE_14 + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data_transf)
summary(ACE_14_EWB) # show results

# Without Depression
ACE_14_EWB_noCESD <- lm(BIT_Wk1_Mean ~ ACE_14 + Age + Sex_2 + Income_2
+ Race_2 + School_2, data=Master_data_transf)

```

```

summary(ACE_14_EWB_noCESD) # show results

# Week 45
ACE_14_EWB_45 <- lm(BIT_Wk45_Mean ~ ACE_14 + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data_transf)
summary(ACE_14_EWB_45) # show results

# Without Depression
ACE_14_EWB_noCESD_45 <- lm(BIT_Wk45_Mean ~ ACE_14 + Age + Sex_2 +
Income_2 + Race_2 + School_2, data=Master_data_transf)
summary(ACE_14_EWB_noCESD_45) # show results

# Week 52
ACE_14_EWB_52 <- lm(BIT_Wk52_Mean ~ ACE_14 + Age + Sex_2 + Income_2 +
School_2 + Race_2 + CESD_SCORE_MEAN_Wk1, data=Master_data_transf)
summary(ACE_14_EWB_52) # show results

# Without Depression
ACE_14_EWB_noCESD_52 <- lm(BIT_Wk52_Mean ~ ACE_14 + Age + Sex_2 +
Income_2 + Race_2 + School_2, data=Master_data_transf)
summary(ACE_14_EWB_noCESD_52) # show results

```

Question 2

```

## ANOVA models

# ANOVA assessing retrospective past, reported present and predicted future SWL based
on CLA levels (zero, moderate, high)
# Within: Time (past, present, future)
# Between: CLA Category (zero, moderate, high)
# Outcome/DV: SWL (continuous)

#STEP 1: Two-way mixed ANOVA test
mix.aov_cap <- anova_test(
  data = SWL_data_transf, dv = SWL, wid = ImportIdRespondent,
  between = CLA_31_cat, within = Time
)
get_anova_table(mix.aov_cap)
# Results: Significant two-way interaction

# STEP 2: Effect of group at each time point
one.way1_cap <- SWL_data_transf %>%
  group_by(Time) %>%

```

```

anova_test(dv = SWL, wid = ImportIdRespondent, between = CLA_31_cat) %>%
get_anova_table() %>%
adjust_pvalue(method = "bonferroni")
one.way1_cap

```

```

# STEP 2b: Pairwise comparisons between categories
pwc1_cap <- SWL_data_transf %>%
  group_by(Time) %>%
  pairwise_t_test(SWL ~ CLA_31_cat, p.adjust.method = "bonferroni")
pwc1_cap

```

STEP 3: Effect of time at each category level

```

# Create new dataframe, omit those with NA value for CLA category
SWL_data_CLA_transf<-
SWL_data_transf[!is.na(SWL_data_transf$CLA_31_cat), ]
view(SWL_data_CLA_transf)

```

```

one.way2_cap <- SWL_data_CLA_transf %>%
  group_by(CLA_31_cat) %>%
  anova_test(dv = SWL, wid = ImportIdRespondent, within = Time) %>%
  get_anova_table() %>%
  adjust_pvalue(method = "bonferroni")
one.way2_cat

```

#Step 3b: Pairwise comparisons between time points at each category levels

```

pwc2_cap <- SWL_data_CLA_transf %>%
  group_by(CLA_31_cat) %>%
  pairwise_t_test(
    SWL ~ Time, paired = TRUE,
    p.adjust.method = "bonferroni"
  ) %>%
  select(-df, -statistic, -p) # Remove details
pwc2_cap

```

Question 3

```

model_3_cap <- lm(SWL_Wk45_Mean~ TSWL_FUTURE_MEAN + CLA_31 +
(TSWL_FUTURE_MEAN * CLA_31) + Age + Sex_2 + Race_2 + Income_2 + School_2
+ CESD_SCORE_MEAN_Wk1, data=Master_data_transf)
summary(model_3_cap) # show results

```

```

model3cd <- lm(SWL_Wk45_Mean~ TSWL_FUTURE_MEAN + CLA_31 +
(TSWL_FUTURE_MEAN * CLA_31) + Age + Sex_2 + Race_2 + Income_2 +

```

```
School_2, data=Master_data_transf)
```

```
summary(model3cd)
```

```
model_3_cap_52 <- lm(SWL_Wk52_Mean~ TSWL_FUTURE_MEAN + CLA_31 +  
(TSWL_FUTURE_MEAN * CLA_31) + Age + Sex_2 + Race_2 + Income_2 + School_2  
+ CESD_SCORE_MEAN_Wk1, data=Master_data_transf)  
summary(model_3_cap_52) # show results
```

```
model3cd_52 <- lm(SWL_Wk52_Mean~ TSWL_FUTURE_MEAN + CLA_31 +  
(TSWL_FUTURE_MEAN * CLA_31) + Age + Sex_2 + Race_2 + Income_2 +  
School_2, data=Master_data_transf)  
summary(model3cd_52)
```

Curriculum Vitae

Stephanie A. Bossert
Department of Psychology,
Graduate School of Arts & Sciences, Wake Forest University

PROFESSIONAL EXPERIENCE:

- 2021 **Institute for Defense Analyses**, Alexandria, VA
Summer Associate, Science and Technology
Division
- 2020-2021 **Wake Forest University**, Winston Salem, NC
Graduate Student, Department of Psychology
- 2017-2020 **Royal Air Forces Mildenhall**, UK
Behavioral Scientist
- 2016-2017 **U.S Air Force Academy Office of Admission**, CO
Admissions Advisor

EDUCATION:

- 2020 **Wake Forest University**, Winston Salem, NC
Master of Science in Psychology
- 2016 **USAF Academy**, Colorado Springs, CO
Bachelor of Science in Behavioral Science and Leadership
Top Sociology Graduate

PAPERS IN PREPERATION:

Bossert, S. A., Tsukayama E., Blackie, L.E.R., Cole, V.T., Jayawickreme, E. *Do We Know Whether We're Happier? Corroborating Perceived Retrospective Assessments of Improvements in Well-Being*. [Manuscript submitted for publication]. Department of Psychology, Wake Forest University.

PROFESSIONAL PRESENTATIONS:

Stephanie Bossert. 2021. "What Makes You Stronger" Presented at the 2021 Society of Southeastern Social Psychologists Annual Conference.

Dr. Sonia Esquivel, Captain Leah Pound, Javaughn Baltrip, Stephanie Bossert and Lucas Brown, 2015. "Examining Sense of Belonging Amongst Culturally Diverse Students at the US Air Force Academy" Presented at the 2016 NASPA Symposium on Military-Connected Students in Orlando, FL.

Dr. Sonia Esquivel and Stephanie Bossert. 2015. "Examining Culturally Diverse Students' Sense of Belonging and Academic Success at USAFA" Presented at 2015 Education Psychology and Humanities Conference in Washington D.C.

Captain Katrina Powell and Stephanie Bossert, 2015 "Examining Sense of Belonging Among Culturally Diverse Cadets at USAFA" Presented at the Annual International Journal of Arts and Sciences' Conference at Harvard University.

Dr. Sonia Esquivel, Captain Katrina Powell, Allyssa Bollig, Stephanie Bossert, Lucas Brown, Bianca Franz and Angelia Villarreal, 2015 "Examining Sense of Belonging Among Culturally Diverse Cadets at USAFA" Presented at Colorado Springs Undergraduate Forum in Colorado Springs, CO.

Dr. Sonia Esquivel, Captain Leah Pound, Javaughn Baltrip, Stephanie Bossert and Lucas Brown, 2015 "Do I Belong? Examining Culturally Diverse Cadets' Sense of Belonging at the United States Air Force Academy" Presented at the Annual National Academic Advising Association Conference in Las Vegas, NV.

Dr. Sonia Esquivel, Captain Leah Pound, Javaughn Baltrip, Stephanie Bossert and Lucas Brown 2015 "Do I Belong? Examining Culturally Diverse Cadets' Sense of Belonging at the United States Air Force Academy" Presented at the Diversity Challenge Conference at Boston College

AWARDS:

2020	Lance P. Sijan Leadership Award, Wing Staff, RAF Mildenhall
2016	Coates Award, Top Graduate in Sociology, USAF Academy Class of 2016
2016	Major General John K. Hester Award for the top graduate who best exemplifies the highest ideals of loyalty, integrity and courage, USAF Academy Class of 2016