

Purpose Maintained:
Adverse Childhood Experiences and Meaning in Life

A Thesis
presented to
the Faculty of the Graduate School
at the University of Missouri-Columbia

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Hope E. Rose
Dr. Laura A. King, Thesis Supervisor
December 2022

© Copyright by Hope Rose 2022

All Rights Reserved

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled.

Purpose Maintained:
Adverse Childhood Experiences and Meaning in Life

presented by Hope Rose,

a candidate for the degree of Master of Arts, and hereby certify that, in their opinion, it is worthy of acceptance.

Dr. Laura A. King

Dr. Kristin M. Hawley

Dr. Christine M. Proulx

Acknowledgements

I would like to express my appreciation to my Master's Thesis Committee, Dr. Kristin Hawley, Dr. Christine Proulx, and Dr. Laura King. I would like to give special thanks to Laura for all of her support and guidance throughout this process. She has dedicated unmeasurable time and effort into helping me grow as both a scholar and person. I would not be where I am today if it wasn't for her. I would also like to thank my friends, especially my fellow graduate students at the Mizzou, who have provided me with endless intellectual and emotional support. Lastly, I would like to thank my husband, Dan Waddell. Dan has provided me with endless support long before I started my graduate studies, and I am so grateful to have him in my life.

Table of Contents

Acknowledgements	ii
List of Tables	v
List of Figures	vi
Abstract	vii
Introduction	1
Negative Childhood Experiences and the Facets of Meaning in Life.....	3
ACEs and Strengths.....	6
Overview	7
Study 1	9
Method	9
Results	10
Brief Discussion	12
Study 2	13
Method	14
Results	14
Brief Discussion	16
Study 3	17
Method	18
Results	20
Brief Discussion	22
Summary of Studies 1-3.....	22
Study 4	23
Method	24
Results	25
Brief Discussion	28
Study 5	30
Method	31

Results	32
Brief Discussion	36
Study 6	37
Method	37
Results	38
Brief Discussion	41
General Discussion	42
Coherence and Significance	43
Purpose	44
Likelihood	45
Limitations.....	46
References	48

List of Tables

Table Page

1. Correlations Among Measures, Study 1	63
2. Regressions Predicting Facets of Meaning, Study 1	64
3. Correlations Among Measures, Study 2	65
4. Regressions Predicting Facets of Meaning, Study 2	66
5. Correlations Among Measures, Study 3	67
6. Regressions Predicting Facets of Meaning, Study 1	68
7. Correlations of ACEs Within Conditions, Study 4	69
8. Correlations Among Measures, Study 5	70
8. Correlations Among Measures, Study 6	71

List of Figures

Figure Page

1. Mediation predicting purpose from ACEs, Study 1	72
2. Mediation predicting global meaning in life from ACEs, Study 1	72
3. Mediation predicting global meaning in life from ACEs, Study 2	73
4. Facet ratings across ACEs, pool Studies 1-3	74
5. Facets after writing about a positive vs. negative memory by ACEs, Study 4	75
6. Facet ratings after negative memory condition across ACEs, Study 4	76
7. Facet ratings after writing about best possible future self by ACEs, Study 5.....	77
8. Facet ratings after writing about worst possible future self by ACEs, Study 5.....	78
9. Likelihood of future self by ACEs and condition, Study 5	79
10. Salience of future self by ACEs and condition, Study 5	80
11. Facet ratings after writing about best possible future self by ACEs, Study 6.....	81
12. Facet ratings after writing about Plan B future self by ACEs, Study 6.....	82
13. Likelihood of future self by ACEs and condition, Study 6	83
14. Salience of future self by ACEs and condition, Study 6	84

Abstract

Adverse childhood experiences (ACEs) are associated with poor functioning in childhood, adolescence, and adulthood. Six studies examined the relationship between ACEs and meaning in life, focusing on the facets of meaning in life—coherence, significance, and purpose. Studies 1 ($N = 1138$ undergraduates), 2 ($N = 705$ undergraduates), and 3 ($N = 822$ noncollege adults) showed that ACEs were negatively related to coherence and significance (controlling for the other two facets) but unrelated to purpose, controlling for significance and coherence, childhood social support (Study 2), and attachment style and neuroticism (Study 3). In all three studies the relationship between ACEs and purpose was fully explained by coherence and significance, even when facet ratings were made with regard to participants' most salient negative childhood experience (Study 3). In a within-person experiment (Study 4; $N = 380$) participants wrote about positive and negative experiences from childhood and rated the facets of meaning immediately after each writing task. A predicted 3-way interaction showed that after recalling a negative childhood memory, ACEs predicted lower significance and coherence but higher purpose. To test the resilience of these findings in a different timeframe, participants wrote about their best possible future self and their worst possible future self (Study 5; $N = 797$) or their Plan B self (Study 6; $N = 346$) and then completed ratings of their facets of meaning in life. When primed to think about a negative future outcome, purpose decreased, particularly among those with high ACEs. ACEs also related to viewing one's best possible future as less likely (Studies 5 and 6) and one's worst possible scenario (Study 5) or Plan B (Study 6) as more likely. Implications for the role of ACEs in adult functioning and the science of meaning in life are discussed.

Purpose Maintained:

Adverse Childhood Experiences and Meaning in Life

Traumatic experiences can lead people to question whether life has meaning. These events can “shatter assumptions” about whether and how life makes sense, about a person’s special place in the world, and about the value of the purposes they seek (Janoff-Bulman, 2002; Janoff-Bulman & McPherson, 1997). Trauma can spur efforts toward the creation of meaning (Alea & Bluck, 2013; George & Park, 2020; Park, 2010) as people attempt to resolve the existential crises that such experiences can inspire. Not surprisingly, traumatic experiences in adulthood are negatively related to self-reported meaning in life (Krause, 2005; Samios et al., 2020; Triplett et al., 2012).

The relationship of trauma to the experience of meaning in life in adulthood speaks to the potentially profound impact such experiences might have when they occur in childhood. After all, childhood is the time when the assumptions about life that underpin the experience of meaning (and that are shattered by trauma in adulthood) presumably develop. Certainly, research shows that traumatic experiences in childhood can leave a legacy of poor outcomes. Adverse childhood experiences (ACEs, Felitti et al., 1998), including violence, physical, sexual or emotional abuse, neglect, caregiver mental health issues or incarceration, are unfortunately somewhat common (Anda et al., 2006; Merrick et al., 2019). ACEs relate to poor functioning, not only in childhood (Chartier, et al., 2010) and adolescence (Moore & Ramirez, 2019) but also in adulthood, including psychological, social, and physical functioning (e.g., Chapman et al., 2004; Carr et al., 2019; Giovanelli et al., 2016; Lehto et al., 2019; McMahon et al., 2018; Murphy et al., 2014; Wiersma et al., 2009).

Do traumatic experiences in childhood leave a lasting existential scar on the experience of meaning in life in adulthood? We addressed this question in three correlational studies and an experiment, focusing primarily on the three facets that contribute to the global experience of meaning in life--coherence, significance, and purpose (e.g., Costin & Vignoles, 2020; George & Park, 2016; Heintzelman & King, 2014; Martela & Steger, 2016). Coherence means that a person experiences life as comprehensible (George & Park, 2013)--as representing a unified whole. Put simply, a coherent life is one that makes sense to the person living it (Baumeister & Vohs, 2002). Existential significance (or mattering) refers to the belief that one's existence and contributions matter to the social world in a lasting way, across time (Costin & Vignoles, 2020). Finally, purpose (a term often used interchangeably with meaning), means a person experiences life to be directed toward personally valued goals and aims (Burrow & Hill, 2020b; McKnight & Kashdan, 2009; White, 2020). These facets figure prominently in conceptual definitions of meaning in life. For example, King and colleagues (2006, p. 180, emphasis added) summarized the various definitions that had been proposed for meaning in life as follows: "Lives may be experienced as meaningful when they are felt to have a *significance* beyond the trivial or momentary, to have *purpose*, or to have a *coherence* that transcends chaos." Self-reports of the three facets contribute to the global sense that life is meaningful (e.g., George & Park, 2017; Krause & Hayward, 2014).

Until recently, most research on meaning in life has relied on *global* measures of the experience (including items like, "My personal existence is meaningful") (King & Hicks, 2021). Many studies show that reports on such measures are associated positively with a broad array of psychosocial and physical health benefits (see King & Hicks, 2021 for a review). Given the litany of negative outcomes correlated with ACEs, it is not surprising that one study (employing psychiatric sample, $N=166$) reported a negative relationship between ACEs and global meaning

in life (measured with items like, “I feel like I have found a really significant meaning for leading my life;” Weibel et al., 2017).

More recently, measures have been designed to tap the three facets of meaning separately from each other (George & Park, 2017) and from global meaning in life (Costin & Vignoles, 2020). The facets of meaning are intertwined, conceptually (George & Park, 2016) and empirically (e.g., Costin & Vignoles, 2020; Womick et al., 2019). Still, predictors can contribute to global meaning in life via one facet, uniquely, controlling for the other two. For instance, intrinsic religiosity, religious fundamentalism, and right-wing authoritarianism contribute positively to global meaning in life primarily through the facet of existential significance, controlling for coherence and purpose (Womick et al., 2019; Womick, et al., 2021). How might early traumatic experiences relate to each of the three facets of meaning in life, independent of the other two? Potential answers to this question can be found in theories of early childhood social development.

Negative Childhood Experiences and the Facets of Meaning in Life

Although differing in various ways, attachment and object relations theories share the general idea that relationships with caregivers in early life are internalized and serve as the foundation for personality development. From these perspectives, the key developmental tasks in childhood involve developing internal representations or working models of the self and others (Bowlby, 1969; Kohut, 1977; Miller, 1981; Winnicott, 1986). Out of adaptive early childhood relationships, the person attains a sense that they exist as a person who matters to people in their lives and acquires a sense that the social world is available, safe, predictable, and reliable. Encountering neglect, abuse, unresponsive caregiving, or having one’s needs subjugated to those of the caregiver can interfere with the development of secure attachment (Bowlby, 1969),

“healthy narcissism” (Kohut, 1977; Miller, 1981), or a sense of self that is, at once, separate from and connected to others (Winnicott, 1986). Similarly, experiences with chaotic, unpredictable, or unreliable caregiving can color the child’s generalized conception of the social world (Bowlby, 1969; see also Horney, 1999). Consistent with the notion that early experiences are relevant to the experience of meaning in adulthood, attachment insecurity in adulthood is negatively related to global meaning in life (Bodner et al., 2014).

The developmental tasks of childhood implicate, especially, two facets of meaning in life—significance and coherence. An internal working model of the self as a person who matters to others is presumably required for the experience of existential significance. An internal working model of the social world as predictable, responsive, and not essentially chaotic is implicated in the experience of coherence. If such internal models continue to serve as foundations for personality throughout life, then negative experiences in childhood should predict lower levels of significance and coherence in adulthood. Thus, we predicted that ACEs would relate independently and negatively to adults’ experience of significance (the sense that the self matters) and coherence (the feeling that life makes sense), controlling for the other two facets of meaning.

The final facet of meaning in life, purpose, potentially presents a different picture. Developmental theory suggests that life purposes emerge during adolescence (Erikson, 1968; Kroger, 2006), later than the foundational accomplishments of internal working models of self and other. As the individual attains a sense of identity, they come to adopt goals that are personally valued (Bryce et al., 2020; Damon et al., 2003). Yet, even negative experiences in adolescence may not preclude a sense of purpose later in life. In a recent study (Pfund, et al., 2020b), older adults (mean age = 60) reported on traumas they experienced in adolescence and

rated their current sense of purpose (e.g., “To me, the things I do are worthwhile”). The researchers probed traumas including natural disasters, betrayal-related trauma, and non-betrayal trauma. Recalled adolescent trauma (regardless of type) was unrelated to participants’ current purpose in life. Although null results are inherently ambiguous, these results are consistent with the idea that purpose may be an aspect of meaning that is spared the damaging effects of trauma earlier in life.

The role of purpose in human fulfillment has long been recognized (Frankl, 1984; Maslow, 1968; Ryff, 1989; Yalom, 1980). Existential scholars have argued that the creation of purposes and commitment to these is an important route to the experience of meaning in life. Frankl (1984) included purposeful work (along with courage and love) as a way for humans to live meaningfully. A sense of purpose is a robust predictor of well-being and much of the literature linking meaning in life to positive outcomes has relied on measures including items that refer explicitly to purpose (King & Hicks, 2021). For example, the most widely used measure of global meaning in life (Brandstätter, et al., 2012), the 5-item Presence of Meaning subscale of the Meaning in Life Questionnaire (MLQ-P; Steger et al., 2006), includes three items explicitly mentioning purpose (e.g., “My life has a clear sense of purpose”).

Purpose has been suggested to be a particularly viable path to resilience through difficult times. Burrow and Hill (2020a) describe the many ways that purpose can be maintained during times of deep uncertainty. In keeping with this idea, purpose predicts resilience against stress (Burrow & Hill, 2013) and is theorized as a pathway to resilience in childhood (Benard, 1991) and adolescence (Damon, 2009). We propose that purpose can provide a pathway to the experience of meaning in life that is maintained among those who have experienced early adversity. Further, purpose is likely to emerge as a motivational pathway toward existential

meaning when the other two paths (coherence and significance) are blocked, damaged, or rendered irrelevant by negative early experiences. If the experience of meaning is a central human motivation (Frankl, 1984), then it is likely that a person who has learned, early on, that the world is *not* essentially coherent and that their own existence does *not*, actually, matter to others in a lasting way, will find meaning via the remaining path—purpose.

The notion that purpose may be spared the effects of difficult childhood experiences contrasts with some published findings. In the MIDUS dataset, ACEs predicted lower purpose in life (measured with items like, “Some people wander aimlessly through life, but I am not one of them;” Hill et al., 2018). In addition, the study linking insecure attachment to lower meaning in life (Bodner et al., 2014) employed the MLQ-P, which, as noted above, contains items explicitly mentioning purpose. Similarly, in a sample of adults, hope (a purpose-adjacent construct defined as personal agency and belief in one’s capacity to overcome obstacles in goal pursuit, Snyder et al., 1994) was negatively related to a history of childhood sexual abuse (Baxter et al., 2017). Importantly, these studies did not account for the potential roles of coherence and significance in the link between ACEs and purpose. The three facets of meaning are positively correlated (Costin & Vignoles, 2020; George & Park, 2017; Womick et al., 2019) and negative relationships between traumatic childhood experiences and purpose may be explained by the unmeasured variables of coherence and significance. Thus, in correlational studies (Studies 1-3) we did not expect ACEs to relate systematically to purpose, controlling for coherence and significance.

ACEs and Strengths

Alongside the large body of evidence cataloguing the negative consequences of ACEs, some research has shown that early negative experiences can relate to the development of

strengths. Early stressful experiences may be “toughening” (Dienstbier, 1989) and allow people to cope better with later adversity (Angelini et al., 2018; Seery et al., 2010). In the stress and coping literature, the notion that people can grow from stressful experiences or use such experiences as a means to the development of personal strengths is represented in the constructs of post-traumatic growth (Tedeschi & Calhoun, 2004), benefit-finding and positive reappraisal (or meaning-related coping, Riley & Park, 2014). One way to make meaning out of traumatic experiences is to adopt purposes inspired by those events (McKnight & Kashdan, 2009; Park, 2010; Sumner et al., 2018; Tedeschi & Calhoun, 2004).

The nuanced relationship that likely exists between ACEs and strengths is documented in the realm of cognition, where research has shown that ACEs relate positively to some cognitive abilities, in particular contexts. When primed with uncertainty, adults with high levels of ACEs show enhanced performance on cognitive skills likely to be useful in chaotic environments, including updating (i.e., the capacity to track and flexibly discount information that is no longer relevant; Young et al., 2018) and shifting (efficiently changing from one task to another; Mittal et al., 2015). Those high in ACEs do not demonstrate these abilities in control conditions.

This research speaks to the idea that childhood experiences shape development in ways that can be maladaptive or adaptive depending on the contemporary context (Ellis et al., 2017). Applying these ideas to the experience of purpose, in an experiment (Study 4), we predicted that those higher in ACEs would respond to reminders of negative (vs. positive) experiences with lower significance and coherence but would maintain a sense of purpose, potentially demonstrating that purpose is a motivational strength emerging out of early adversity.

Overview

Four studies probed the relationships between ACEs and the facets of meaning in life. Studies 1 through 3 tested the prediction that, controlling for the other two facets, ACEs would independently and negatively predict coherence and significance but not purpose, when facet ratings were made in general (Studies 1 and 2) and in reference to a specific negative childhood experience (Study 3). In Studies 1 through 3, we expected that ACEs would relate to purpose only through the indirect effects of coherence and significance. Collectively, these studies tested a number of covariates and potential moderators of these relationships, including demographics (all studies), childhood social support (Study 2), attachment style, neuroticism, and mood (all in Study 3). In addition, in Studies 1 and 2, we modeled the association between ACEs and global meaning in life through the facets of meaning, testing the possibility that purpose might provide a route to existential meaning independent of ACEs.

Study 4 was a within-person experiment modeled after research on ACEs and cognitive skills. Participants reported on ACEs and then wrote about positive and negative childhood memories (in counterbalanced order). After each writing task, they rated the facets of meaning. We expected condition to interact with ACEs and meaning facet such that recalling a negative childhood memory would lower significance and coherence but show the resilience of purpose for those high in ACEs.

Studies 5 and 6 addressed an important ambiguity left by Study 4—whether the timeframe of the manipulation influenced the results. Studies 5 and 6 employed a future-oriented threat (or boost) to meaning in life and examined the effects on the facets of meaning.

Data for all of the completed studies were collected prior to the COVID-19 pandemic and all were conducted in accord with APA Ethical Guidelines and approved by the Institutional Review Board at the investigators' university.

Study 1

Study 1 explored the relationships between ACEs, the facets of meaning in life, and global meaning in life. We predicted that ACEs would correlate negatively with global meaning in life. Based on the theoretical perspectives reviewed above, controlling for the other two facets, we expected ACEs to predict lower coherence and significance but not purpose. We tested whether any observed relationship between ACEs and purpose was explained by coherence and significance. Finally, we modeled the relationship between ACEs and global meaning in life through the facets of meaning. Study 1 was not preregistered.

Method

Participants and Procedures

Participants ($N = 1138$) were college students from a central US university (725 women, 403 men, 10 other/preferred not to answer), who completed an online questionnaire in partial fulfillment of a research participation requirement in General Psychology. Represented ethnicities included 85.7% white/European American, 9.8% Black/African American, 5.4% Asian, 5.6% Latinx, 3.4% “other” or prefer not to say. Ages ranged from 18 to 51, $M (SD)$, 18.61 years (1.74). The sample size for Study 1 was determined by the number of students who completed the assessment.

Materials

Surveys included a variety of measures that were administered to all students in General Psychology as part of a mass pretesting. We report only on the measures used in these analyses. Unless otherwise indicated, all measures employed a 1-7 rating scale with 1 indicating low and 7 indicating high endorsement.

Participants completed the Adverse Childhood Experience Questionnaire (ACE; Dube et al., 2003; Felitti et al., 1998). Adapted from the ACE Study from the Kaiser Permanente Health Care Group, it measures exposure to a variety of negative experiences prior to age 18. Questions are answered in a yes/no format (e.g., “Did a parent or other adult in the household often or very often... Push, grab, slap, or throw something at you? Or Ever hit you so hard that you had marks or were injured?”). We analyzed this scale continuously, on a 0-10 scale. The distribution of ACEs in this sample was, no ACEs ($n = 480$), one ACE ($n = 241$), a medium number of ACEs (2 or 3; $n = 224$), and high number of ACEs (4 or more; $n = 160$).

Global meaning in life and its facets were measured using the 16-item Tripartite Meaning Scale (Costin, & Vignoles, 2020). Four 4-item subscales measure global meaning in life (e.g., “My entire existence is full of meaning,”), coherence (e.g., “My life makes sense”), existential mattering or significance (e.g., “I am certain that my life is of importance”), and purpose (e.g., “I have certain life goals that compel me to keep going”). None of the global meaning items refer explicitly to any of the facets.

Results

Descriptive statistics, reliabilities, and correlations among all measures are shown in Table 1. Consistent with past research (e.g., Alcalá, et al., 2017; Winstanley, et al., 2020), women reported more ACEs than men did. Gender did not interact with ACEs to predict outcomes (all p 's $> .138$) and so it was included only as a covariate in multivariate analyses. ACEs related negatively to global meaning in life and all of its facets. The correlation between ACEs and purpose was significantly weaker than for ACEs and coherence, $z = 4.56$ ($p < .001$), and marginally weaker than ACEs and significance, $z = 1.89$ ($p = .029$).

Three hierarchical regression equations tested the prediction that ACEs would be negatively related to coherence and significance but not purpose, controlling for the other two facets. Each facet of meaning was regressed on demographics (gender, race/ethnicity, and age) (Step 1), the other two facets of meaning (Step 2), and ACEs on the final step. As can be seen in Table 2 and as predicted, ACEs contributed significantly and negatively to coherence and significance. In contrast, controlling for demographics and the other two facets of meaning, ACEs did not significantly contribute to purpose.

Of course, a nonsignificant p -value does not provide evidence for or against the null hypothesis. How strong is the evidence in favor of the null for the relationship between ACEs and purpose? The Jeffrey-Zellner-Siow (JZS) Bayes factor (Liang et al., 2008; Rouder & Morey, 2012), which evaluates the R^2 for the step, considering the number of covariates included and the df , suggests the null of no association between ACEs and purpose is $> 55,000$ times more likely than the alternative of an association. A Bayes factor > 100 is described as “decisive” evidence (Dienes, 2014). This result strongly supports the null.

Regression results support the idea that the zero-order correlation between ACEs and purpose is explained by coherence and significance. To probe this possibility directly, we computed a mediational model predicting purpose from ACEs through coherence and significance, using PROCESS Macro for SPSS, v22.16.3 (Model 4, Hayes, 2016). Note that these data are cross-sectional and these analyses do not purport to test for causality. Rather, our goal was to estimate the extent to which the link between ACEs and purpose might be explained by indirect effects through coherence and significance.

Figure 1 shows that the paths from ACEs to significance and coherence fully explained the negative association between ACEs and purpose. Both indirect effects were significant; for

ACES through coherence, $b(SE) = -0.12(0.02)$, 95% $CI = [-0.15, -0.08]$; for ACES through significance, $b(SE) = -0.10(0.02)$, 95% $CI = [-0.14, -0.06]$. Controlling for coherence and significance, the direct effect of ACEs on purpose was (positive and) nonsignificant, $b(SE) = 0.03(0.01)$, 95% $CI = [-0.002, 0.06]$, $p = .068$. In contrast to results for purpose, the direct effect of ACEs on coherence and significance remained significant controlling for the other two facets. For coherence, $b(SE) = -0.08(0.02)$, $p < .001$, 95% $CI = [-0.11, -0.05]$; for significance, $b(SE) = -0.10(0.03)$, $p < .001$, 95% $CI = [-0.15, -0.04]$. As predicted, ACEs are most directly related to the meaning facets of coherence and significance and are independent of a sense of purpose.

We computed a final mediational model predicting global meaning in life from ACEs through the facets, controlling for demographics. Once again, this analysis is not meant to probe causation but to estimate the extent to which cross-sectional links are explained through the shared variance with other variables. As Figure 2 shows, ACEs significantly and negatively contributed to all three of the facets of meaning (including purpose) and all three facets contributed significantly to global meaning in life. Controlling for demographics and the facets of meaning, the direct path from ACEs to global meaning in life remained significant, $b(SE) = -0.04(0.01)$, 95% $CI = [-0.07, -0.02]$, $p < .001$. All indirect effects of ACEs through the facets on global meaning in life were significant. For coherence: $b(SE) = -0.03(0.01)$, 95% $CI = [-0.04, -0.02]$; significance: $b(SE) = -0.05(.01)$, 95% $CI = [-0.07, -0.03]$; and purpose: $b(SE) = -0.01(0.004)$, 95% $CI = [-0.02, -0.01]$. The indirect effect of ACEs through purpose was significantly weaker than that for coherence ($z = 3.71$) and significance ($z = 4.64$), p 's $< .001$.

Brief Discussion, Study 1

Results support the prediction that ACEs have specific relevance to coherence and significance. In addition, as expected, controlling for coherence and significance, ACEs were unrelated to purpose. Mediation analyses support the conclusion that the apparent negative relationship between ACEs and purpose is explained by shared variance with coherence and significance. These findings are consistent with the idea that previously reported negative relationships between ACEs and sense of purpose (e.g., Hill et al., 2018) can be explained by the related experiences of coherence and significance.

Still, the relationship between ACEs and global MIL was explained through all three facets of meaning (including purpose, although the indirect effect was weaker than that for coherence and significance). The experience of purpose is related to social support (George & Park, 2013). Accounting for the overall supportiveness of the childhood context might help account for the small but significant link between ACEs and global meaning in life through purpose in this sample. Study 2 addressed this possibility.

Study 2

Study 2 sought to replicate and extend Study 1 in another sample of college students. As in Study 1, we expected the negative links between ACEs and coherence and significance (but not purpose) to obtain controlling for the other two facets of meaning. We predicted that the link between ACEs and purpose would be accounted for by the indirect effects of ACEs through the other two facets. Study 2 included a measure of childhood social support to probe whether the quality of childhood social support would influence these relationships. ACEs, after all, represent only a count of adverse experiences without accounting for the larger social/emotional context in which those experiences occurred. Including a measure of childhood social support allowed us to account for the more general context of participants' childhoods. Finally, we modeled the

association of ACEs to global meaning in life through the facets of meaning, this time controlling for childhood social support and demographics. Study 2 was not preregistered.

Method

Participants and Procedure

Participants ($N = 705$) were college students from a central US university (435 women, 272 men, 8 other/preferred not to answer), who completed an online questionnaire in partial fulfillment of a research participation requirement in General Psychology. Race/ethnicity was distributed as follows: 70.6% white/European American, 10.8% Black/African American, 3.9% Asian/Asian American, 2.0% Latinx, 12.7% “other” or prefer not to say. Ages ranged from 18 to 54, $M = 19.10$ years, $SD = 1.87$. The sample size for Study 2 was determined by the number of students who completed the assessment.

Materials

ACEs, global meaning in life, and the facets of meaning were measured as in Study 1. Analyses below treat ACEs continuously. The distribution of reported ACEs were as follows: no ACEs ($n = 346$); one ACE ($n = 155$); a medium number of ACEs (2 or 3; $n = 121$); and those who have experienced a high number of ACEs (4 or more; $n = 82$).

Participants completed the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988), a 12-item scale tapping perceived support from friends and family during childhood (e.g., “I got the emotional help and support I needed from my family”). Items were rated on a scale from 1 (low endorsement) to 7 (high endorsement).

Results

Table 3 shows descriptive statistics, reliabilities, and correlations among all measures. Compared to men, women reported more ACEs, higher global meaning in life, higher

significance and purpose, but lower coherence. Gender did not interact with ACEs in predicting the outcomes (all p 's $\geq .07$) so it was included only as a covariate in multivariate analyses.

Childhood social support was negatively related to ACEs and positively related to meaning in life and all facets of meaning. ACEs related negatively to global meaning in life and all facets. The correlation of ACEs and purpose was significantly weaker than that for ACEs and coherence, $z = 2.85$, $p = .002$, and ACEs and significance, $z = 2.36$, $p = .009$.

Next, each facet was regressed hierarchically on demographics (Step 1), the other two facets (Step 2), and ACEs (Step 3). As Table 4 shows, replicating Study 1, ACEs contributed significantly and negatively to coherence and significance but were unrelated to purpose. The JZS Bayes factor suggests the null of no association between ACEs and purpose is $> 11,000$ times more likely than the alternative.

Childhood social support did not moderate the links between ACEs and the facets of meaning (all p 's $> .050$). Adding childhood social support to the models in Table 4 did not affect the results for coherence or significance. However, controlling for childhood social support, a small relationship between ACEs and purpose was significant and *positive*, $\beta = .08$, $p = .021$, and the relationship between ACEs and global MIL was no longer significant $\beta = -.05$, $p = .091$.

Next (with the same cautions as noted in Study 1), we tested a mediational model predicting purpose from ACEs through significance and coherence to estimate the indirect effects of ACEs on purpose through these facets. As in Study 1, the relationship between ACEs and purpose was fully explained through coherence and significance. As in Study 1, both indirect effects were significant: For ACEs through coherence, $b(SE) = -0.06(.01)$, 95% $CI = [-0.09, -0.04]$ and ACEs through significance, $b(SE) = -0.04(.01)$, 95% $CI = [-0.06, -0.02]$. Controlling for coherence and significance, the direct effect of ACEs on purpose was not significant, $b(SE) =$

0.03(.02), 95% $CI = [-0.02, 0.65]$, $p = .23$. As in Study 1, the direct effect of ACEs on coherence and significance remained significant controlling for the other two facets. For coherence, $b(SE) = -0.10(0.03)$, $p < .001$, 95% $CI = [-0.15, -0.04]$; for significance, $b(SE) = -0.08(0.02)$, $p = .000$, 95% $CI = [-0.12, -0.0]$. Once again, results point to the special relevance of childhood trauma to adults' experience of coherence and significance.

A final mediational model predicted global meaning in life from ACEs through the facets of meaning, controlling for demographics and childhood social support. As shown in Figure 3, the relationship between ACEs and global meaning in life was accounted for by indirect effects through coherence and significance, with no direct link to purpose. For the direct effect of ACEs on global meaning in life, $b(SE) = -0.04(0.02)$, 95% $CI = [-0.08, 0.01]$, $p = .09$. For the indirect effect of ACEs through coherence, $b(SE) = -0.02(0.01)$, 95% $CI = [-0.03, -0.01]$. For the indirect effect of ACEs through significance, $b(SE) = -0.03(0.01)$, 95% $CI = [-0.05, -0.01]$. ACEs did not contribute to global meaning in life through purpose, $b(SE) = 0.00(0.01)$, 95% $CI = [-0.02, 0.02]$.

Brief Discussion, Study 2

As in Study 1, ACEs were negatively related to adults' experience of coherence and significance but not purpose, controlling for the other two facets. In addition, Study 2 showed that, with childhood social support held constant, ACEs predicted global meaning only through their relationships to coherence and significance. The overall quality of a child's social environment is an important consideration in the link between ACEs and meaning in life. Study 2 results are consistent with the idea that purpose is spared the negative effect of early trauma and that it retains its capacity to enhance global meaning in life, independent of ACEs and the other two facets of meaning. Of course, null results are rarely viewed as cause for celebration. However, Figure 4 suggests that the lack of a link between ACEs and purpose is good news.

Purpose, apparently immune to the effects of ACEs, continues to positively relate to the general feeling that life is meaningful, in adults.

Studies 1 and 2 support our predictions but these studies are limited in potentially important ways. Participants were college students, among whom those with many ACEs may represent a group of people who successfully navigated difficult childhoods to enroll in college—a group that might be unusual in terms of a sense of purpose (Pfund, et al., 2020a). Results might not generalize to adults who are not enrolled in college. In addition, few participants in the first two studies reported high levels of ACEs (14% in Study 1 and 11.6% in Study 2 reported 4 or more ACEs; compared to nearly 16% reported in a large U.S. survey, Merrick et al., 2019). A sample drawn from a more diverse pool might include a greater percentage of those with more ACEs and allow for stronger conclusions about those high in childhood traumatic events. Finally, although in these studies ACEs and facets of meaning were related as predicted, these measures were also rather divorced from each other. Perhaps if the facet ratings were made with more direct relevance to a traumatic childhood experience, purpose would show results more similar to coherence and significance.

Study 3

Study 3 aimed to replicate, conceptually, the first two studies with a sample that was more diverse in the domain of education and in which there might be more people reporting many ACEs. In addition, to tie the facet ratings more directly to childhood negative experiences, participants were asked to consider the most salient childhood trauma disclosed on the assessments and to rate their feelings of coherence, significance, and purpose with specific reference to these incidents.

Study 3 also expanded on the covariates included. ACEs are related positively to neuroticism (Lehto et al., 2019; McElroy & Hevey, 2014; Grusnick et al., 2020). Study 3 included a measure of neuroticism to ensure that results for coherence and significance are not due to general negative affectivity. Meaning in life is related to mood (Chu, et al., 2020; Tov & Lee, 2016), so Study 3 included a measure of state mood. Additionally, instead of childhood social support, Study 3 included measures of parental attachment, which may be more relevant to the theoretical accounts reviewed previously. Attachment style mediates the relationship between childhood trauma and subjective well-being (Barnum & Perrone-McGovern, 2017), life satisfaction (Hinnen et al., 2009), the development of depression or anxiety (Bifulco et al., 2006), and post-trauma symptoms, later in life (Muller et al., 2012). Finally, in addition to the ACEs measure, participants completed another measure of childhood trauma that incorporated a rating of severity. Measures and analyses were pre-registered,

https://osf.io/2ex68?view_only=1f97959f24b44a2d92df574f45141bb9.

Method

Participants and Procedure

Participants ($N = 822$; 481 women, 328 men, 11 non-binary, 2 prefer not to say) were recruited from Cloud Research to complete this online study for a small payment. Ages ranged from 18 to 49 years, $M (SD) = 24.92$ years (4.50). Ethnicity was distributed as follows: 63% white/European American, 11.6% Black/African American, 8.2% Asian American, 11.0% Latinx, 6.4% “other” or prefer not to say. The highest level of education was distributed as follows: 16.7% high school or trade school, 30.5% some college, 9.5% associate’s degree, and 39.6% reported receiving a bachelor’s degree or higher. We initially tried to recruit a larger

number of participants who had never attended college but eventually had to open up the study to a wider range of people. The sample size for Study 3 was determined by budget constraints.

Materials

In addition to the measures described below, participants completed an array of measures for a broader project on well-being. Unless otherwise noted, rating scales ranged from 1 (low endorsement) to 7 (high endorsement). Attachment style was measured with the Experiences in Close Relationships Scale (ECR-S, Fraley, et al., 2011) on which participants rated their relationships with their parents (or parent-like figures). Scores were computed for anxious attachment (e.g., “I’m afraid this person may abandon me”) to mother $\alpha = .92$, $M (SD) = 3.16$ (1.56) and father, $\alpha = .93$, $M (SD) = 3.95$ (1.77); and avoidant attachment (e.g., “I don’t feel comfortable opening up to this person”) to mother, $\alpha = .92$, $M (SD) = 2.56$ (1.73) and father, $\alpha = .92$, $M (SD) = 2.88$ (1.84). Ratings were positively correlated across parents: for anxious attachment $r = .39$; for avoidant attachment $r = .54$, p ’s < .001. To simplify analyses, scores were aggregated across parents to create anxious and avoidant attachment composites. In addition, neuroticism was measured using the NEO-PI-R (e.g., “I am not a worrier,” recoded; Costa, & McCrae, 1992), $M (SD) = 3.99$ (0.98).

Childhood trauma was measured in two ways. First, participants completed the ACEs measure from the previous studies, $M (SD) = 2.60$ (2.49), with 216 reporting no ACEs; 148 reporting one; 206 reporting 2 or 3; and 268 reporting 4 or more. Second, participants completed the Childhood Traumatic Events Scale (CTES, Pennebaker, & Susman, 1988, 2013). On this measure, participants indicated the occurrence of events similar to those on the ACEs measure (e.g., death of close friend/family, traumatic sexual experiences, extreme injury/illness) and rated

the severity of each event on a 0-7 scale. CTES scores are calculated as mean severity ratings for all reported traumas, $M (SD) = 1.26 (1.33)$.

Next, participants were asked to reflect on the adverse childhood experience they had rated on the ACEs and CTES that stood out to them most. They then rated two items for each meaning facet with instructions to focus on how the event made them feel: for coherence (“I could make sense of the things that happened in my life;” “I felt like the world and my life didn’t make sense to me,” reverse-scored), $M (SD) = 3.59 (1.56)$; for significance (“I felt like my existence mattered to people around me;” “I felt like whether I lived or died didn’t matter to anyone,” reverse-scored) $M (SD) = 4.21 (1.74)$; for purpose (“I felt even more determined to achieve my life goals;” “I felt like I would have trouble pursuing goals in my life,” reverse-scored), $M (SD) = 3.63(1.57)$.

Finally, participants rated current mood and reported demographics. For positive affect (PA), they rated pleased, happy, and cheerful, $M (SD) = 4.42 (1.28)$. For negative affect (NA), they rated anxious, sad, angry, afraid, and frustrated, $M (SD) = 3.89 (1.66)$.

Results

Table 5 shows the reliabilities and correlations among all measures. Compared to men, women reported more ACEs, more severe childhood trauma, lower trauma related coherence and purpose, and higher neuroticism. Gender did not interact with ACEs in predicting the outcomes (all p 's $\geq .60$) and was treated only as a covariate in multivariate analyses. ACEs, the CTES, and neuroticism were negatively correlated with the facets of meaning rated with regard to a specific negative childhood experience. Anxious and avoidant attachment were positively related to each other, and both were positively related to ACEs and the CTES. Both types of insecure attachment were negatively correlated with the facets of meaning. PA was negatively related to

ACEs, the CTES, avoidant attachment, and neuroticism. The zero-order correlations of ACEs with coherence and purpose were identical. Both were significantly weaker than that for ACEs and significance, $z = 2.76, p = .003$.

Because ACEs and CTES scores were positively correlated and related to the other variables in a parallel fashion, we standardized these scores and created a composite ($\alpha = .83$), to simplify analyses. This childhood trauma composite was negatively related to trauma-related coherence, $r = -.44, p < .001$, significance, $r = -.45, p < .001$, and purpose, $r = -.39, p < .001$.

Each facet of trauma-related meaning was regressed hierarchically on demographics (Step 1), mood, attachment, neuroticism (Step 2), the other facets of meaning (Step 3), and the childhood trauma composite (Step 4). As Table 6 shows, current PA positively predicted purpose, only. The contribution of PA to purpose was significantly stronger than its contribution to coherence, $z = 3.10 (p = .002)$ and significance, $z = 4.54, (p < .001)$. Neuroticism significantly and negatively contributed to coherence and purpose but not significance. Anxious attachment contributed negatively to significance, only. Avoidant attachment contributed to coherence (positively) and significance (negatively). On the final step, childhood trauma significantly predicted lower significance and coherence and did not contribute to purpose. The JZS Bayes factor indicates the null of no association between childhood trauma and purpose is $> 1,000,000$ times more likely than the alternative. Neither attachment styles nor education (dummy coded as 0 = never attended college; 1 = some or more college attended) significantly moderated the associations between childhood trauma and the facets of meaning (p 's $> .13$).

We next estimated the indirect effects of ACEs on purpose through coherence and significance, for ratings made for a specific trauma. As in the first 2 studies, the direct effect of childhood trauma on purpose was fully explained by significance and coherence. For the direct

effect of childhood trauma on purpose, $b(SE) = -0.06(0.05) [-0.16, 0.03]$, $p = .19$. Indirect effects of childhood trauma on purpose through coherence and significance were significant; for coherence, $b(SE) = -0.34(0.04) [-0.40, -0.26]$; for significance, $b(SE) = -0.33(0.04) [-0.41, -0.26]$. In contrast, in analogous models, the direct effects from childhood trauma to coherence and significance remained significant controlling for the other two facets. For coherence, $b(SE) = -0.07(0.02)$, $p < .001$; and for significance, $b(SE) = -0.15(0.02)$, $p < .001$.

Brief Discussion, Study 3

As in the first two studies, childhood trauma was independently negatively related to coherence and significance but, controlling for these relationships, was unrelated to purpose, even when participants reflected on a personally salient negative experience from childhood and in a sample in which nearly a third (32.6%) reported 4 or more ACEs. Correlations between childhood trauma and coherence and significance were not explained by attachment or neuroticism nor moderated by attachment or education. Thus, negative childhood experiences share consistent negative links to two facets of meaning in life, coherence and significance. In contrast, they are unrelated to purpose, independent of these associations. This pattern is consistent with the conclusion that purpose is spared the effects of negative childhood experiences, except as these relate to coherence and significance.

Summary of Studies 1-3

To summarize these three studies, we conducted an exploratory analysis. First, within each sample, we regressed each facet of meaning on the other two facets and saved the residuals, with no other covariates included. We then merged the datasets ($N = 2,633$ with complete data). The residual scores for each facet of meaning were submitted to a 3 (facet of meaning: coherence, significance, purpose) X 4 (ACEs: none, low, medium, high) General Linear Model

(GLM) treating meaning facet as a within-person factor and ACEs as a between-person factor. The facet X ACEs interaction was significant, $F(3, 2629) = 9.38, p < .001, d = 0.21$.

Figure 4 shows the residualized facets across ACEs. As can be seen, coherence drops precipitously after low levels of ACEs. Significance drops in a stepwise fashion, from 0 to 1 event, and then again from medium to high events. Purpose remains relatively stable across ACEs with a slight (nonsignificant) uptick at high levels of ACEs. As can be seen from the CI's, among those high in ACEs ($n=511$), purpose was significantly higher than coherence and significance, illustrating the potential resilience of purpose to negative childhood experiences among those with high levels of ACEs.

In sum, three cross-sectional studies consistently support two conclusions. First, adverse childhood experiences are negatively related to experiences of coherence and existential significance in adulthood. Second, controlling for coherence and significance, such experiences are not related to an adult's sense of purpose. Across three studies, the evidence in favor of the null is decisive (Dienes, 2014; Leppink, et al., 2017) if not overwhelming. Finding that negative childhood experiences have no independent relationship to purpose suggests that purpose is available as a route to meaning in life for those with negative childhood experiences but it does not demonstrate that purpose may be a motivational strength for people who have experienced difficult childhoods. Study 4 extended these studies using an experimental paradigm similar to that used to examine the link between ACEs and cognitive skills.

Study 4

Study 4 was a within-participant experiment probing how reminders of childhood experiences might influence feelings of coherence, significance, and purpose as a function of ACEs. Participants (who had reported on ACEs) wrote about very positive and very negative

experiences from childhood, in counterbalanced order. After writing about each memory, participants rated the facets of meaning in terms of how the experience they had just written about made them feel. We predicted a 3-way (facet of meaning X memory condition X ACEs) interaction. We did not make specific predictions for ACEs in the positive memory condition, which we viewed as a control condition for thinking about the past. Because recalling a positive memory is likely to enhance positive mood, we expected that this condition would lead to high levels of all facets of meaning. For the negative childhood memory condition, we expected that ACEs would predict lower feelings of coherence and significance. However, drawing on research on cognitive skills and based on the idea that early childhood adversity might foster the resilience of purpose, we expected those with more ACEs to maintain a sense of purpose in response to reminders of negative childhood events. Measures and analyses were pre-registered https://osf.io/6vbxk/?view_only=d86f110f35af40e08cf27f36dbf29ed1.

Method

Participants

Participants ($N = 380$; 296 women, 83 men, 1 not reporting) were students from a Midwestern university who completed this online study in partial fulfillment of research participation requirements in General Psychology. Ages ranged from 18 to 28 years, $M (SD) = 18.63$ years (4.23). The sample was 78.0% white/European American, 9.4% Black/African American, 3.8% Asian/Asian American, 3.3% Latinx, 4.5% other or prefer not to say. (Four participants who reported age younger than 18 years completed the study but are not included in analyses). The sample size for Study 3 was determined by the number of students who enrolled in the study in one semester.

Procedures and Materials

Participants completed a number of individual difference measures for a larger project on well-being prior to completing the neuroticism, $M (SD) = 3.68 (0.76)$ and attachment measures from Study 3, for anxious attachment, $M (SD) = 2.73 (1.19)$; for avoidant attachment, $M (SD) = 1.81 (1.17)$. They also completed the ACEs measure from the previous studies, $M (SD) = 1.36 (1.88)$. For analyses, ACEs were treated categorically, with the following distribution: None ($n = 180$), Low (1 ACE; $n = 91$), Medium (2 or 3 ACEs; $n = 74$), and High (4 or more ACEs; $n = 49$).

Childhood Memory Primes. Next, participants were instructed to write about an experience prior to 13 years old, in which they felt particularly bad (good), and worse (better) than they typically did, in as much detail as they felt comfortable sharing (responses averaged 37 words). Negative and positive memory conditions were completed in counterbalanced order.

Dependent Measures. Immediately after writing about each memory, participants rated the same 2 items for each facet of meaning as in Study 3.

Additional Measures. After rating the facets of meaning, participants completed other ratings of the experience they had written about. These included whether the experience was a self-defining memory, whether it still influenced their daily lives, and whether this event was a “one-off” experience or something that happened daily. They also completed a single-item, rating their childhood, overall, on a scale from 0-100, with 0 indicating “*Very Negative*” and 100 indicating “*Very Positive*,” $M (SD) = 82.44 (18.59)$. These variables did not affect the patterns of results reported below and are not discussed further. Finally, participants reported demographics.

Results

There was no gender difference on ACEs; among men, $M (SD) = 1.33 (1.91)$; among women, $M (SD) = 1.37 (1.87)$. The small number of men precluded examining gender X ACEs interactions (some cell sizes < 11). Preliminary analyses showed no significant effects involving the order of the positive and negative memory conditions, (all p 's > .12). Subsequent analyses collapsed across orders.

To test predictions, facet responses were submitted to a 3 (facet of meaning: coherence vs. significance vs. purpose) X 2 (memory condition: positive vs. negative) X 4 (ACES: none vs. low vs. medium vs. high) repeated measures GLM with the facets of meaning and memory condition as within-person factors and ACEs as a between-person factor. All multivariate effects were significant (p 's < .001) except for the memory condition X ACEs interaction ($p = .88$). Main effects and lower order interactions were qualified by the predicted facet of meaning X memory condition X ACEs interaction, $F(6,752) = 11.43, p < .001, d = 0.59$. When neuroticism and attachment styles were added as covariates (along with their interactions), the 3-way remained significant, $F(6, 746) = 7.24, p < .001, d = .51$. To decompose this interaction, we analyzed the writing conditions separately.

The top panel of Figure 5 shows the mean facet ratings completed after writing about a positive childhood memory. As can be seen, ratings were uniformly high (all > 5.5 on a 1-7 scale). Only main effects for meaning facet, $F(2, 378) = 3.19, p = .024, d = 0.50$, and ACEs were significant, $F(3,378) = 4.52, p = .004, d = 0.38$. For the main effect of meaning facet, Bonferroni corrected comparisons showed that, regardless of ACEs, participants reported greater significance than coherence or purpose, d 's = 0.49, 0.34, respectively. They also reported greater purpose than coherence, $d = 0.20$. For ACEs, regardless of the facet of meaning considered, ratings were lower as ACEs increased, similar to results for cognitive skills in past research, that

fail to show cognitive strengths among those high in ACEs in control conditions. Collapsing across the facets of meaning, Bonferroni corrected post hoc comparisons showed the zero and low ACEs groups did not differ from each other but were both higher than the high ACEs group. The medium ACEs group did not differ from any of the others.

The bottom panel of Figure 5 shows the means for the facets in the negative memory condition. Main effects for facet, $F(2, 377) = 56.33, p < .001, d = 0.77$, and ACES, $F(3, 377) = 17.72, p < .001, d = 0.74$, were qualified by a significant facet of meaning X ACES interaction, $F(6, 387) = 19.00, p < .001, d = 0.77$. As can be seen in Figure 6, after writing about a negative childhood memory, coherence and significance decreased as ACEs increased. Bonferroni corrected post hoc comparisons showed that for coherence, those reporting none and low levels of ACEs did not differ from each other and were significantly higher on coherence than those who reported medium and high levels. Medium levels of ACES were also associated with significantly higher coherence than high levels. For significance, those with none or low levels of ACEs did not differ from each other and were both significantly higher than those reporting medium or high levels of ACEs (which did not differ from each other). In contrast, after recalling a negative childhood memory, feelings of purpose increased as ACEs did. Bonferroni corrected post hoc comparisons showed that those reporting medium or high levels of ACEs did not differ significantly from each other but reported significantly higher purpose, combined $M (SD) = 4.71 (1.43)$, compared to those reporting none or low levels of ACEs, combined $M (SD) = 3.76 (1.29)$. These results suggest that early adversity may lead to a capacity to maintain a sense of purpose in response to a reminder of negative childhood events.

Comparing the condition effect sizes across the facets of meaning is illuminating. Among participants who reported medium or high ACEs ($n = 119$), the effect sizes (Hedge's g) for the

memory valence conditions for coherence, $g = -1.99$, $[-2.36, -1.64]$, and significance, $g = -1.22$, $[-1.50, -0.96]$, were about twice as large as that for purpose, $g = -0.67$, $[-0.95, -0.39]$. The condition effect size for purpose fell outside the 95% *CI*s for both coherence and significance. The *CI*s for coherence and purpose did not overlap. Among those reporting no or few ACEs ($n = 261$), significance, $g = -0.90$ $[-1.06, -0.74]$, rather than purpose, $g = -1.84$ $[-2.09, -1.60]$, showed a distinctively small effect size. For coherence, $g = -1.41$ $[-1.61, -1.21]$. The *CI* for the effect size for significance falls outside those for the other two facets of meaning, reflecting relatively high levels of this rating in the negative memory condition, $M (SD) = 5.12 (1.38)$. In this group, significance (rather than purpose) appears to be more resilient to reminders of negative experiences.

Focusing on the negative memory condition only, Figure 6 shows the (raw) facet ratings across ACEs. Similar to the pooled data from Studies 1-3, among those with high levels of ACEs, purpose was higher than coherence and significance.

Table 7 shows that ACEs (treated as a continuous variable ranging from 0 to 9) were negatively related to all facet ratings, except for purpose in the negative memory condition. In this condition only, ACEs were positively correlated with purpose.

Brief Discussion, Study 4

Study 4 shows not simply that negative childhood experiences are unrelated to purpose, but that purpose is maintained in the face of reminders of those difficult times among those with medium or high levels of ACEs. Reminders of negative childhood experiences led to lower coherence and significance but higher purpose, as ACEs increased, suggesting that surviving negative childhood experiences may allow people to develop the motivational strength of purpose.

One ambiguity in these conclusions is the extent to which timeframe might influence the results of Study 4. The manipulation in Study 4 focused on the past—on memories of childhood experiences. Compared to coherence and significance, purpose is inherently more future-oriented (e.g., Pfund et al., 2021). It might be that the experiences of coherence and significance in a childhood memory context are more attached, temporally, to that timeframe. In contrast, purpose may be less affected by a manipulation about the past as purpose itself is more attached to an imagined future. Study 5 examined whether purpose would show similar resilience among those experiencing more ACEs to a manipulation using a future timeframe for positive and negative experiences.

Study 5

Study 5 examined whether ACEs predict higher purpose among people who have been primed with a negative imagined future. Participants were assigned randomly to write about either their best or worst possible future self. A large body of literature attests to the benefits of writing about one's best possible self, over time, for a host of outcomes (Layous, et al., 2012; Meevissen et al., 2011; see Loveday et al., 2018 for a review). This manipulation has been used to enhance a sense of purpose (Burrow & Hill, 2013). Although generally employed as a well-being intervention, for the present purposes, this exercise was used as a way to prime a positive future. The worst possible future self (King, et al., 1998; Markus, H., & Nurius, 1986; Norem & Illingworth, 1993) have not generally been studied. Negatively framing the possible self manipulation provides a way to prime a negative future. If imagining one's best possible self boosts purpose, it seems reasonable that instructions to imagine the worst-case scenario for the future approximate a threat targeted specifically at purpose. Thus, Study 5 presented a

particularly strong test of the resilience of purpose as a source of meaning in the presence of adversity among those high in ACEs.

Because possible selves are imagined futures, this study also provided an opportunity to explore how ACEs relate to how people think about their futures. In this study, participants rated how likely they judged each possible future self to be. In addition, we assessed the mental salience of the future selves. Research has shown that when possible selves are experienced as difficult to imagine they may be viewed as less likely to occur (Fisher & Oyserman, 2017). Study 5 probed the relations between ACEs and views of the likelihood and mental salience (the ease of imagining the self and the vividness of the mental imagery it aroused).

With regard to the facets of meaning in life, we predicted results to be similar to those for Study 4, showing that after imagining future failure, those who have experienced more negative childhood experiences will report lower coherence and significance but higher purpose. If early hardship develops a sense of resilience of purpose, Study 4 results should replicate. However, it's possible that having a tainted view of the past might taint someone's views of future problems, and lead to lower purpose among those who experienced higher ACEs.

Method

Participants

Participants ($N = 797$; 467 women, 310 men, 17 non-binary, 3 prefer not to say; 71.6% white/European American, 13.6% Black/African American, 11.9% Asian American, 10.2% Latinx, 3.7% other or prefer not to say) were recruited from Cloud Research to complete this online study for a small payment. Ages ranged from 18 to 35 years, $M (SD) = 28.20$ years (3.95). The highest level of education was distributed as follows: 14.0% high school or trade school, 22.8% some college, 10.4% associate's degree, and 43.3% reported receiving a bachelor's

degree or higher. The sample size was determined based on the size of Study 3, as this was a between person design.

Materials and Procedures

Childhood trauma was measured similarly as in Studies 1-3. Participants completed the Revised ACEs (Finkelhor et al., 2012), and responses were collapsed into categories of “None,” “Low,” “Medium,” and “High.”¹

Possible Self Instructions

After completing the ACEs measure, participants were randomly assigned to write about either their best or worst future possible selves.

For the best possible future self, instructions were (after King, 2001, p. 801):

Think about your life in the future. Imagine that everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all of your life goals. Think of this as the realization of all of your life dreams. Now, write about what you imagined, in as much detail as you feel comfortable providing.

The worst possible future self instructions were adapted from the worst possible self-instructions (as well as King et al., 1998):

Think about your life in the future. Imagine that everything has gone as poorly as it possibly could. Despite working hard, you have failed to accomplish your life goals. Think of this as the worst-case scenario for your life in the future. Now, write about what you imagined, in as much detail as you feel comfortable providing.²

¹ Participants completed a variety of potential covariates as well. These did not alter the study’s results and will not be discussed further.

² In Studies 5 and 6 responses were screened to ensure that the provided text comported with instructions. This screening resulted 16 participants being excluded in Study 5 and 12 being excluded in Study 6.

Dependent Measures

After each writing task, participants immediately answered questions on how thinking about these scenarios made them feel. They responded to the same MIL facet questions from Study 4 edited to be future tense, answering two questions for each of the corresponding facets of meaning (e.g., “I would feel like my existence mattered to the people around” for significance; “I would be able to make sense of the things that have happened in my life” for coherence; and “I would feel even more determined to achieve my goals” for purpose). Participants also rated the likelihood of the future self, “How likely does this future self you wrote about feel at the present time?” Finally, they rated two items regarding the imagery of the imagined future (“How easy was it to produce a mental image and imagine this future self?” “How vivid was your mental image of your imagined future self?”). These latter ratings were correlated, $r = .67$ for the best possible self and $r = .70$ for the worst possible self, p 's $< .001$ and they were aggregated to measure the salience of each possible self.

Results

There was significant gender difference on ACEs, $t(735.49) = -4.55$, $p < .001$, $d = 0.32$; among men, $M(SD) = 2.93(2.93)$; among women, $M(SD) = 3.61(3.51)$.³ Gender did not interact with ACEs in predicting the outcomes (all p 's $\geq .58$). Because accounting for gender had no impact on results, analyses below do not include gender. Correlations and reliabilities, collapsed across conditions, are in Table 8. ACEs were unrelated to all of the facets of meaning and likelihood, and positively related to salience of the predicted future. All of the facets of

³ Note that in Studies 5 and 6, degrees of freedom reflect Greenhouse-Geisser correction when necessary.

meaning were positively related to each other, and all were positively related to likelihood and salience.

Facet responses were submitted to a 3 (facet of meaning: coherence vs. significance vs. purpose) X 2 (writing condition: best vs. worst) X 4 (ACES: none vs. low vs. medium vs. high) repeated measures GLM with the facets of meaning as within-person factor and condition and ACEs as between-person factors. A large main effect for condition, $F(1, 785) = 1363.12, p < .001, d = 2.64$, was qualified by a facet of meaning X possible self condition X ACEs interaction, $F(5.69, 1488.82) = 3.99, p < .001, d = 0.25$. To decompose this interaction, we analyzed the conditions separately.

Figure 7 shows the mean facet ratings in the best possible future self condition. As can be seen, ratings were uniformly high (all > 5.6 on a 1-7 scale). Only the main effect of meaning facet was significant, $F(1.90, 743.58) = 6.16, p = .003, d = 0.25$. Bonferroni corrected post hoc comparisons showed that, after writing about their best possible future self, participants felt more purpose, $M(SD) = 6.01(1.19)$, than coherence, $M(SD) = 5.79(1.16)$, or significance $M(SD) = 5.84(1.26), p \leq .019$. Pairwise comparison showed that among those who reported low ACEs, purpose was significantly higher than significance, $p = .024$, and among those who reported high ACEs, purpose was significantly higher than coherence, $p < .001$. No other significant differences emerged.

Figure 8 shows the means for the facets in the worst possible future self condition. Main effects for facet, $F(1.86, 730.85) = 37.67, p < .001, d = 0.62$, and ACEs, $F(3, 393) = 5.96, p < .001, d = 0.42$, were qualified by a significant facet of meaning X ACEs interaction, $F(5.58, 730.85) = 4.07, p < .001, d = 0.35$. As can be seen, ratings were low, overall (all < 3.3 on a 1-7 scale). As predicted, after writing about their worst possible future self, significance decreased as

ACEs increased. However, there were no significant differences in coherence as ACEs increased, and counter to predictions, as ACEs increased, purpose *decreased*. Those reporting high levels of ACEs, $M (SD) = 1.99 (1.35)$ reported significantly less purpose than those reporting no ACEs, $M (SD) = 2.50 (1.24)$, Bonferroni corrected $p = .012$. There were no significant differences among those reporting high, medium, or low levels of ACEs, Bonferroni corrected $p \leq .138$. Purpose was lower than significance and coherence across ACEs.

Within condition, for those in the best possible self condition, ACEs were unrelated to coherence $r = -.09$, significance, $r = -.02$, and purpose, $r = -.04$, all p 's $\geq .077$. In the worst possible self condition, in contrast to Study 4, ACEs were negatively related to all three facets of meaning (coherence, $r = -.10$, $p = .038$; significance, $r = -.26$, $p < .001$; purpose, $r = -.14$, $p = .007$).

Ratings of Possible Selves: Likelihood and Salience

Next, a 2 (condition: best vs. worst) X 4 (ACES: none vs. low vs. medium vs. high) ANOVA tested if ACEs and condition related to the likelihood of imagined future outcomes. Means are in Figure 9. There was a significant main effect for condition, $F(1, 783) = 114.13$, $p < .001$, $d = 0.76$, with participants, generally, viewing their best possible future self as more likely $M (SD) = 4.18 (1.90)$ than their worst possible future self $M (SD) = 2.85 (1.78)$, Bonferroni corrected $p < .001$, $d = 0.72$. This main effect was qualified by a significant condition X ACES interaction, $F(3,783) = 10.96$, $p < .001$, $d = 0.41$. Those reporting high levels of ACEs, $M (SD) = 3.81 (2.02)$ rated their best future self as less likely compared to those who experienced no ACES, $M (SD) = 4.75 (1.73)$, Bonferroni corrected $p < .001$, $d = 0.27$. While those reporting high levels of ACEs, $M (SD) = 3.38 (2.01)$ rated their worst possible self as more likely compared to

those who experienced none, $M (SD) = 2.62 (1.61)$, low, $M (SD) = 2.36 (1.54)$, or medium ACEs, $M (SD) = 2.65 (1.55)$, Bonferroni corrected p 's $\leq .025$.

Finally, a 2 (condition: best vs. worst) X 4 (ACES: none vs. low vs. medium vs. high) ANOVA tested if ACEs and condition were related to the salience of future selves. Figure 10 shows the means. There were significant main effects for condition, $F(1, 784) = 25.75, p < .001, d = 0.36$ and ACEs, $F(3, 784) = 5.88, p < .001, d = 0.30$. Participants who wrote about their best possible future self reported higher salience $M (SD) = 5.75 (1.35)$ than those who wrote about their worst possible future self $M (SD) = 5.19 (1.54)$, Bonferroni corrected $p < .001$. Regardless of condition, those who experienced high ACEs reported higher salience, $M (SD) = 5.71 (1.51)$ than those who did not experience any ACEs $M (SD) = 5.13 (1.53)$, Bonferroni corrected $p < .001$. Figure 10 shows the means.

These main effects were qualified by a significant condition X ACEs interaction, $F(3,783) = 6.27, p < .001, d = 0.31$. In the absence of significant differences by ACEs in the best possible self condition, in the worst possible self condition, those who reported no ACEs, $M (SD) = 4.62 (1.57)$ rated their worst possible future as less salient than those who experienced medium, $M (SD) = 5.50 (1.35)$, or high levels of ACEs, $M (SD) = 5.61 (1.53)$, Bonferroni corrected p 's $< .001$. There were no differences in salience by condition for those who experienced medium or high level of ACEs. Those who experienced none or only 1 ACE rated their best possible future self as more salient, $M (SD) = 5.76 (1.23), 5.78 (1.25)$, respectively, compared to their worst possible future self, $M (SD) = 4.62 (1.57), 5.02 (1.32)$, Bonferroni correct p 's $< .007$.

In the best possible self condition, ACEs were negatively related to likelihood $r = -.18, p < .001$ and unrelated to salience, $r = -.004, p = .93$. In the worst possible self condition, ACEs were positively related to likelihood, $r = .21$, and salience, $r = .25, p$'s $< .001$. In the best possible self condition, likelihood was unrelated to all three meaning facets, while in the worst possible

self condition, likelihood was positively related to coherence, $r = .19$ and purpose, $r = .11$, p 's $\leq .028$, but unrelated to significance, $r = .01$, $p = .812$. In the worst possible self condition, salience was negatively related to significance, $r = -.20$ and purpose, $r = -.17$, p 's $< .001$, but unrelated to coherence, $r = -.05$, $p = .290$. In the best possible self condition, salience was positively related to all three meaning facets (coherence, $r = .29$, significance, $r = .28$, and purpose, $r = .35$, all p 's $< .001$). When controlling for the other facets of meaning, significance was no longer related to salience in the best possible self condition. In the worst possible self-condition, controlling for the other facets of meaning, purpose was unrelated to salience or likelihood, and significance was now negatively related to likelihood. Finally, we tested whether ACEs and purpose interacted to predict likelihood or salience and found that they did not (p 's $\geq .514$).

Brief Discussion, Study 5

Generally, Study 5 did not support predictions about the resilience of purpose in response to a threat to future purpose among those high in ACEs. Certainly, the possible self exercises did affect purpose. Imagining one's best possible future led to particularly high purpose, regardless of childhood trauma, while imagining one's worst possible future led to low levels of all facets regardless of ACEs. Indeed, no evidence emerged for the possibility that experiencing early hardship produces a resilient sense of purpose in the face of difficulties imagined in the future. Participants anticipated feeling purpose the least if their worst-case scenario came to pass. Those who experienced none or only one ACE anticipated higher significance and purpose in their worst-case scenario.

Additionally, childhood trauma was related to viewing best and worst-case scenarios for one's life to be equally easy to imagine and vivid. Those who experienced no or very little trauma in childhood had a harder time imagining their worst possible outcome. This difficulty in imagining a worst-case scenario may be a sign of lack of preparation, that high levels of ACEs provide for people. Individuals who have experienced trauma in early life may be mentally prepared for negative future outcomes. Alternatively, it may imply that those high in ACEs lack a sense of metacognitive distinction between these selves that might promote goal success or the optimism that may be required for goal achievement.

An important consideration is the very strong condition main effect, with the best possible self condition leading to very high levels across facets and the worst possible self-condition leading to very low levels across facets. Failure does not necessarily constitute one's worst-case scenario. Failure can also be conceptualized as falling short of one's goals and expectations and settling for "Plan B." Perhaps the strength of the manipulation in Study 5 simply overpowered potential effects of ACEs on purpose. To test this possibility, we conducted Study 6.

Study 6

Study 6 participants wrote about their best possible future self and their "Plan B" future and completed measures of the meaning facets. We predicted results to be similar to those for Study 4, showing that after imagining their Plan B, those who have experienced more negative childhood experiences would report lower coherence and significance but higher purpose. As in Study 5, participants also rated the likelihood and salience of their best possible self and their Plan B.

Method

Participants

Participants ($N = 346$; 245 women, 94 men, 5 non-binary/an alternative identity, 2 not reporting; 83.2% white, 9.2% Black/African American, 5.2% Asian/Asian American, 5.8% Latinx, 1.5% other) were students from a Midwestern university who completed this online study in partial fulfillment of research participation requirements in General Psychology. Ages ranged from 18 to 48 years, $M (SD) = 19.20$ years (1.99). The sample size was determined by the number of students who enrolled in the study in one semester.

Materials and Procedures

All participants first completed the best possible self writing task followed by facet, likelihood, and salience ratings from Study 5. Then, all participants were instructed to imagine that this future did not work out and wrote about their “Plan B” future and then complete the dependent measures. As in Study 5, the items regarding the ease of imagining and the vividness of the imagery were correlated, $r = .63$ for best possible self; $r = .76$ for Plan B, both p 's $< .001$ and were aggregated to create a measure of salience.

Plan B Instructions

The Plan B writing instructions were as follows:

Now, imagine that future you wrote about did not work out. You worked hard but were unable to accomplish the goals you set for yourself. Many of the aspects of the future you imagined in the previous question are not available to you. What is your Plan B or a "second best" future? Think of what this future would look like. Now, write about what you imagined, in as much detail as you feel comfortable providing.

The order of conditions was held constant (best possible self followed by Plan B) because the Plan B instructions would not make sense outside of the context of a Plan A.

Results

Correlations and reliabilities are in Table 9. ACEs were unrelated to the facets of meaning in the best possible self condition but was negatively related to significance in the worst possible self-condition. ACEs also related negatively to imagining one's best possible future was likely but was unrelated to believing their Plan B was likely. All of the facets of meaning were positively related to each other within condition, and worst possible self significance was positively related to the best possible self facets of meaning. Women reported significantly more ACEs, $M (SD) = 2.25 (2.45)$, than men, $M (SD) = 1.34 (1.76)$; $t (232.89) = -3.81$, $p < .001$, $d =$

0.27. Gender did not interact with ACEs or condition in predicting the outcomes (all p 's $\geq .22$) and was removed from further analyses.

Facet responses were submitted to a 3 (facet of meaning: coherence vs. significance vs. purpose) X 2 (condition: best possible self vs. Plan B) X 4 (ACEs: none vs. low vs. medium vs. high) repeated measures GLM with the facets of meaning and condition as within-person factors and ACEs as a between-person factor. All multivariate effects were significant (p 's $< .001$) except for the condition X ACEs interaction ($p = .240$) and facet X ACEs interaction ($p = .114$). For the main effect of condition, $F(1, 342) = 420.91, p < .001, g = 1.26$. Main effects and lower order interactions were qualified by a facet of meaning X memory condition X ACEs interaction, $F(5.89, 671.55) = 4.15, p < .001, d = 0.36$. To decompose this interaction, we analyzed the writing conditions separately.

Figure 11 shows the mean facet ratings after writing about best possible future self. As can be seen, ratings were uniformly high (all > 5.6 on a 1-7 scale). A main effect for meaning facet, $F(1.87, 640.53) = 44.24, p < .001, d = 0.72$ emerged, with coherence rated significantly lower than significance and purpose regardless of ACEs (Bonferroni corrected p 's $< .001$). This main effect was qualified by a significant facet of meaning X ACEs interaction, $F(5.62, 640.53) = 2.26, p = .040, d = 0.28$. Bonferroni corrected post hoc comparisons showed that those reporting high levels of ACEs reported significantly lower coherence, $M(SD) = 5.65(1.15)$, compared to those reporting no ACEs, $M(SD) = 6.07(0.93), p = .023$. No other significant differences emerged.

Figure 12 shows the means for the facets after writing about "Plan B." Main effects emerged for facet, $F(1.90, 650.20) = 139.71, p < .001, d = 1.28$ and ACEs, $F(3, 342) = 3.27, p = .021, d = 0.34$ emerged. Significance, $M(SD) = 5.22(1.43)$ was significantly higher than

coherence, $M (SD) = 4.19 (1.47)$ and purpose, $M (SD) = 4.16 (1.64)$, Bonferroni corrected p 's < .001. Those who experienced high ACEs $M (SD) 4.23 (1.60)$ reported lower overall meaning in life (facets combined) than those who experienced no ACEs, $M (SD) = 4.78 (1.47)$, Bonferroni corrected $p = .019$. These main effects were qualified by a significant facet of meaning X ACES interaction, $F (5.70, 650.20) = 2.67, p = .016, d = 0.31$. Bonferroni corrected post hoc comparisons showed that those reporting high levels of ACEs reported significantly lower significance, $M (SD) = 4.70 (1.59)$, compared to those reporting no ACEs, $M (SD) = 5.58 (1.33)$ $p < .001, d = 0.41$. No other significant differences emerged. As can be seen in Figure 12, participants reporting high ACEs did rate purpose higher than those with medium ACEs, but this difference was not significant.

Ratings of Best Possible Self and Plan B: Likelihood and Salience

Analyses next examined estimates of likelihood and salience across the possible selves. For likelihood, there was a significant main effect for condition, $F(1, 342) = 50.40, p < .001, g = 0.41$. As in Study 5, participants thought their best possible future was more likely $M (SD) = 4.90 (1.47)$ than their Plan B $M (SD) = 3.95 (1.60)$, Bonferroni corrected $p < .001$. This main effect was qualified by a significant condition X ACES interaction, $F(3,342) = 4.38, p = .005, d = 0.40$. Again, as in Study 5, those who experienced high levels of ACEs, $M (SD) = 4.54 (1.73)$ were less likely to believe their best future self was likely compared to those who experienced no ACEs, $M (SD) = 5.15 (1.24)$, Bonferroni corrected $p = .023$. See Figure 13 for means. With regard to Plan B, ACEs were unrelated to likelihood judgments. Across conditions, those who had none, low, and medium ACEs believed their best possible future was more likely, Bonferroni corrected p 's < .003, while those who experienced high ACEs, believed their Plan A and Plan B future were equally likely.

For the salience of imagined future selves, only the main effect for condition, $F(1, 342) = 282.57, p < .001, g = 0.93$, was significant. Figure 14 shows means. Participants reported their best possible future self as more salient, $M (SD) = 5.82 (1.29)$ than their Plan B $M (SD) = 4.09 (1.73)$, Bonferroni corrected $p < .001$.

Exploratory Analysis

Finally, we conducted some exploratory analyses. As in Study 5, ACEs and purpose did not interact to predict likelihood or salience, (p 's $\geq .087$). Additionally, we examined whether ACEs moderated the relationship between how likely participants thought their best possible self was, controlling for Plan B, and found ACEs was unrelated ($p = .329$). Finally, we tested whether ACEs moderated the association between best possible self likelihood and Plan B likelihood and found ACEs did not (all p 's $\geq .081$).

Finally, we

Brief Discussion, Study 6

Contrary to predictions, purpose was not maintained when faced with the idea of a negative future outcome, regardless of levels of ACEs. Imagining ones Plan B future led to lower purpose, overall. Significance showed the greatest resilience of the facets of meaning when faced with the idea of pursuing a Plan B. While this effect was strongest for those with little to no childhood trauma, even those with higher levels of ACEs anticipated feelings more significant when faced with their Plan B future scenario.

As in Study 5, participants were more likely to believe their best possible future was likely, except for those who experienced high levels of ACEs, who believed their best possible self and Plan B futures were equally likely. It is worth noting that both of these likelihood ratings were objectively high—for best possible self, $M (SD) = 4.54 (1.73)$; for Plan B: $M (SD) = 4.25$

(1.78), demonstrating that those who experienced high levels of ACEs appear to show a relatively high level of optimism that their best future is possible, while maintaining a realism that their Plan B future is equally likely.

One issue with Study 6 is the order of conditions. The Plan B condition was always preceded by consideration of the best possible self. It is possible that this order created a contrast effect, and it is possible that those with more ACEs were more susceptible to this effect. It might be that after considering a very positive future, a person's Plan B was viewed as especially likely for those high in ACEs.

General Discussion

These studies support five conclusions. First, ACEs predict lower levels of global meaning in life (Studies 1-2) and are negatively related to the facets of coherence and significance, independent of the other facets of meaning (Studies 1-3). Second, purpose does not share the independent negative relationship that characterizes the link between coherence, significance, and ACEs (Studies 1-3). Third, after recalling a negative childhood experience, ACEs are negatively related to coherence and significance but positively related to purpose (Study 4). Fourth, after reflecting on a negative future outcome, ACEs were unrelated to coherence, and negatively related to significance (Studies 5 and 6) and purpose (Study 5). Finally, ACEs are negatively related to believing a best possible future is possible, and positively related to a less desirable future is possible (Studies 5 and 6). These results have implications for our understanding of the role of childhood experiences in adults' experience of meaning in life, and views of their possible futures.

Consistent with theoretical approaches suggesting the long-term impact of early social relationships on adult personality functioning (e.g., Bowlby, 1969; Kohut, 1977; Miller, 1981;

Winnicott, 1986), ACEs relate to deficits in the experiences of coherence and significance. Still, it might be expected that, even in the context of problematic childhoods, people could attain a strong sense that life makes sense and that they are people who matter to others. The possibility that these associations are explained by more proximal experiences that inform current levels of coherence and significance should be probed by future research. We consider some of these more proximal variables and the implications of these results for each facet of meaning below.

Coherence and Significance

Regarding coherence, time frame seems to matter greatly in its relationship with childhood trauma. When coherence is oriented to the past (Study 4) and present (Studies 1-3), it is negatively related to ACEs. However, when coherence was oriented toward the future, it was unrelated to ACEs (Studies 5-6). Unlike reflected or current coherence, those who experienced no ACEs reported equally low levels of coherence and felt their lives would not make sense if their worst possible or Plan B futures were actualized. Part of this might be related to the optimism that participants felt regarding their future selves. In Studies 5 and 6, all participants, even those high in ACEs, thought their best possible future was more likely. It seems that everyone felt like their life would not make sense if this subjectively “likely” best possible future did not work out.

To the extent that traumas require a person to “make sense” of an experience, cognitive capacities may play a role in coherence (Ward & King, 2017). In a 20-year prospective study, ACEs predicted lower high school graduation and skilled jobs (Giovanelli et al., 2016). ACEs also predict long-term socioeconomic challenges (Kim, et al., 2020; Merrick et al., 2019; Testa & Jackson, 2020). Cognitive ability, executive function, academic achievement, education, and financial resources may contribute to the link between ACEs and coherence. When looking

towards the future, childhood trauma is unrelated to feelings of coherence when anticipating a negative future outcome. Considering future adversity disrupted coherence, regardless of ACEs.

Significance was negatively related to ACEs in all studies except after writing about an imagine best possible future. With regard to significance, social exclusion lowers the feeling of existential mattering (e.g., Williams, 2007). In adults, ACEs relate positively to loneliness (Babad, et al., 2020; Lin & Chiao, 2020). Thus, current feelings of belonging or loneliness might explain the association between ACEs and existential significance. ACEs are also negatively related to self-esteem (Kim, et al., 2021) and self-concept clarity (Wong et al., 2019). These self-related variables might serve as more proximal explanations of the link between ACEs and existential significance. It is notable that writing about one's best possible self boosted significance for all participants, suggesting that this purpose-related activity may help to enhance a sense of significance even among those high in childhood adversity.

Thwarted significance has been implicated in behaviors harmful to others and the self. For example, low feelings of personal significance, damaged self-worth, and early childhood experiences of parental rejection are suggested as factors in high school shootings (Bonanno & Levenson, 2014; Thompson & Kyle, 2005). Significance Quest Theory (Kruglanski, et al., 2009) holds that low significance may predispose people to suicidal terror attacks. Finally, feeling like a burden rather than a contributor is implicated in the interpersonal theory of suicide (Van Orden et al., 2010). The present studies suggest that an insult to significance in childhood can damage existential mattering in a lasting way. Examining the effects of distal (i.e., childhood experiences) and proximal (e.g., social rejection) significance threats would help integrate existential meaning in such important outcomes.

Purpose

ACEs' relationship with purpose seems largely dependent upon the timeframe in which it is examined. With regard to the present, ACEs were unrelated to purpose (Studies 1-3), while reflecting on past trauma, ACEs were positively related to purpose (Study 4). With regard to the future, results were mixed. When considering a worst possible future self, ACEs were negatively related to purpose (Study 5); when thinking about falling back on a Plan B future, ACEs were unrelated to purpose (Study 6).

Clearly, after considering a negative future, purpose did not show the same resilience for those high in ACEs as was demonstrated in Study 4. ACEs were *negatively* related to purpose in Study 5 and unrelated in Study 6. These results suggest the importance of probing potential moderators of the link between ACEs and future purpose. Future-oriented constructs may be important to consider. Hope, or a feeling of expectation, desire, and trust that something desirable will happen, may be an important variable to consider in this regard. It may be that among those with a high level of ACEs, those who are more prone to experience hope might show resilience of purpose even in the context of future failure. Among those lacking in hope, a worst-case scenario might be especially devastating to a sense of purpose. Optimism might similarly operate as a moderator of the link between ACEs and purpose.

Likelihood

Everyone except those who experienced high levels of ACEs believed their best possible self was more likely than their worst or Plan B future self. In Study 5, a between-person experiment, high levels of ACEs was associated with viewing one's best possible future self as less likely (in the best possible self condition) and one's worst possible self as more likely (in the worst possible self condition). In Study 6, a within person experiment, those who reported high levels of ACEs felt that their best possible and Plan B future selves were equally likely to occur.

Those who have experienced difficult childhoods may view their future prospects without the benefit of rose-colored glasses. This difference may suggest a lack of optimism among these individuals. The lack of strong distinction between their best, worst, or Plan B outcomes might also portend problems in goal commitment, pursuit, and achievement. However, it might also indicate a level of realism, wisdom, and coping skills that those with high ACEs have developed. Thinking these non-ideal futures are more likely, may indicate a level of preparedness to accept these futures if they come to pass. Meanwhile, those with no or few ACEs may be less prepared to face the reality of their ideal best possible future not being actualized.

Limitations

Limitations of these studies warrant note. As already considered, the links uncovered between ACEs and facets of meaning may rely on more proximal variables that were not measured. In addition, ACEs reports rely on memory and are subject to potential memory bias and forgetting. Future research might follow children or adolescents who have experienced verified traumas to examine how meaning in life (and its facets) are predicted by those experiences over time. The positive relationship between ACEs and purpose after considering a negative event is correlational (not causal). It seems unlikely that people who are prone to respond to negative events with a sense of purpose would, themselves, be especially likely to experience ACEs (or to remember such events), but longitudinal evidence would help clarify the direction of this relationship. Although we attempted to recruit a sample that was more diverse on education in Study 3, the present samples continue to reflect relatively educated people. Future research should examine the associations uncovered here in people with no college education. As noted above, the potential order effects that might have effect Study 6 results are ambiguous.

All studies were conducted in the United States, rendering the cultural generalizability of the conclusions ambiguous. ACEs predict poor outcomes in an array of cultural contexts (e.g., Lin & Chiao, 2020; Zhang, et al., 2020). Meaning in life predicts life outcomes across cultures, as well (Czekierda, et al., 2017; Lew, et al., 2020). Nevertheless, examining how the facets of meaning contribute to global meaning in life across cultures is an important gap left by the present studies.

References

- Alcalá, H. E., Tomiyama, A. J., & von Ehrenstein, O. S. (2017). Gender differences in the association between adverse childhood experiences and cancer. *Women's Health Issues, 27*(6), 625-631.
- Alea, N., & Bluck, S. (2013). When does meaning making predict subjective well-being? Examining young and older adults in two cultures. *Memory, 21*(1), 44-63.
- Amemiya, A., Fujiwara, T., Shirai, K., Kondo, K., Oksanen, T., Pentti, J., & Vahtera, J. (2019). Association between adverse childhood experiences and adult diseases in older adults: A comparative cross-sectional study in Japan and Finland. *BMJ Open, 9*(8), e024609.
- Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C. H., Perry, B. D., ... & Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood. *European Archives of Psychiatry and Clinical Neuroscience, 256*(3), 174-186.
- Babad, S., Zwilling, A., Carson, K. W., Fairchild, V., & Nikulina, V. (2020). Childhood environmental instability and social-emotional outcomes in emerging adults. *Journal of Interpersonal Violence, <https://doi.org/10.1177/0886260520948147>*.
- Barnum, E. L., & Perrone-McGovern, K. M. (2017). Attachment, self-esteem and subjective well-being among survivors of childhood sexual trauma. *Journal of Mental Health Counseling, 39*(1), 39-55.
- Baumeister, R. F., & Vohs, K. D. (2002). The pursuit of meaningfulness in life. In C. R. Snyder, & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 608–618). New York, NY: Oxford.

- Baxter, M. A., Hemming, E. J., McIntosh, H. C., & Hellman, C. M. (2017). Exploring the relationship between adverse childhood experiences and hope. *Journal of Child Sexual Abuse, 26*(8), 948-956.
- Bifulco, A., Kwon, J., Jacobs, C., Moran, P. M., Bunn, A., & Beer, N. (2006). Adult attachment style as mediator between childhood neglect/abuse and adult depression and anxiety. *Social psychiatry and psychiatric epidemiology, 41*(10), 796-805.
- Bonanno, C. M., & Levenson Jr, R. L. (2014). School shooters: History, current theoretical and empirical findings, and strategies for prevention. *Sage Open, 4*(1), doi: 10.1177/2158244014525425.
- Bonner, T., DeLisi, M., Jones-Johnson, G., Caudill, J. W., & Trulson, C. (2020). Chaotic homes, adverse childhood experiences, and serious delinquency: Differential effects by race and ethnicity. *Justice Quarterly, 37*(4), 697-714.
- Bowlby, J. (1962). *Attachment and Loss, Vol. 1: Attachment. 2nd edition*. Basic Books.
- Brandstätter, M., Baumann, U., Borasio, G. D., & Fegg, M. J. (2012). Systematic review of meaning in life assessment instruments. *Psycho-Oncology, 21*, 1034–1052.
doi:10.1002/pon.2113
- Bryce, C. I., Alexander, B. L., Fraser, A. M., & Fabes, R. A. (2020). Dimensions of hope in adolescence: Relations to academic functioning and well-being. *Psychology in the Schools, 57*(2), 171-190.
- Burrow, A. L., & Hill, P. L. (2013). Derailed by diversity? Purpose buffers the relationship between ethnic composition on trains and passenger negative mood. *Personality and Social Psychology Bulletin, 39*(12), 1610-1619.

- Burrow, A. L., & Hill, P. L. (2020a). Purpose by design or disaster: Preserving a sense of purpose amid environmental uncertainty. *Journal of Environmental Psychology*, *69*, 101436.
- Burrow, A. L., & Hill, P. L. (Eds.) (2020b). *The Ecology of Purposeful Living Across the Lifespan*. Springer.
- Carr, A., Nearchou, F., Duff, H., Mhaoileoin, D. N., Cullen, K., O'Dowd, A., & Battigelli, L. (2019). Survivors of institutional abuse in long-term child care in Scotland. *Child Abuse & Neglect*, *93*, 38-54.
- Chapman, D. P., Whitfield, C. L., Felitti, V. J., Dube, S. R., Edwards, V. J., & Anda, R. F. (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders*, *82*(2), 217-225.
- Chartier, M. J., Walker, J. R., & Naimark, B. (2010). Separate and cumulative effects of adverse childhood experiences in predicting adult health and health care utilization. *Child Abuse & Neglect*, *34*(6), 454–464. doi:[10.1016/j.chiabu.2009.09.020](https://doi.org/10.1016/j.chiabu.2009.09.020).
- Chu, S.T.W., Fung, H.H., & Chu, L. (2020). Is positive affect related to meaning in life differently in younger and older adults? A time sampling study. *Journal of Gerontology, Series B*. In press. <https://doi.org/10.1093/geronb/gbz086>
- Cohn, M. A., Fredrickson, B. L., Brown, S. L., Mikels, J. A., & Conway, A. M. (2009). Happiness unpacked: positive emotions increase life satisfaction by building resilience. *Emotion*, *9*(3), 361-368.
- Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual*. Odessa, FL: Psychological Assessment Resources.

- Costin, V., & Vignoles, V. L. (2020). Meaning is about mattering: Evaluating coherence, purpose, and existential mattering as precursors of meaning in life judgments. *Journal of Personality and Social Psychology, 118*(4), 864-884.
- Czekierda, K., Banik, A., Park, C. L., & Luszczynska, A. (2017). Meaning in life and physical health: Systematic review and meta-analysis. *Health Psychology Review, 11*(4), 387-418.
- Damon, W. (2009). *The path to purpose: How young people find their calling in life*. Simon and Schuster.
- Damon, W., Menon, J., & Bronk, K. C. (2003). The development of purpose during adolescence. *Applied Developmental Science, 7*(3), 119-128.
https://doi.org/10.1207/S1532480XADS0703_2
- Dienes, Z. (2014). Using Bayes to get the most out of non-significant results. *Frontiers in Psychology, 29*. <https://doi.org/10.3389/fpsyg.2014.00781>
- Dienstbier, R. A. (1989). Arousal and physiological toughness: Implications for mental and physical health. *Psychological Review, 96*(1), 84-100. <https://doi.org/10.1037/0033-295X.96.1.84>.
- Dube, S. R., Felitti, V. J., Dong, M., Chapman, D. P., Giles, W., & Anda, R. F. (2003). Childhood abuse neglect and household dysfunction and the risk of illicit drug use: The Adverse Childhood Experiences Study. *Pediatrics, 111*, 564–572.
- Ellis, B. J., Bianchi, J., Griskevicius, V., & Frankenhuis, W. E. (2017). Beyond risk and protective factors: An adaptation-based approach to resilience. *Perspectives on Psychological Science, 12*(4), 561-587.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. Norton

- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). The relationship of adult health status to childhood abuse & household dysfunction. *American Journal of Preventive Medicine*, 14, 245–258.
- Font, S. A., & Maguire-Jack, K. (2016). Pathways from childhood abuse and other adversities to adult health risks: The role of adult socioeconomic conditions. *Child Abuse & Neglect*, 51, 390-399.
- Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The Experiences in Close Relationships-Relationship Structures questionnaire: A method for assessing attachment orientations across relationships. *Psychological Assessment*, 23, 615-625.
- Frankl, V. E. (1984). *Man's search for meaning revised and updated*. Washington Square Press.
- Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology*, 84(2), 365-376.
- George, L. S., & Park, C. L. (2020). Do violations of global beliefs and goals drive distress and meaning making following life stressors? *Illness, Crisis & Loss*, in press.
<https://doi.org/10.1177/1054137320958344>.
- George, L. S., & Park, C. L. (2013). Are meaning and purpose distinct? An examination of correlates and predictors. *The Journal of Positive Psychology*, 8(5), 365-375.
- George, L. S., & Park, C. L. (2017). The multidimensional existential meaning scale: A tripartite approach to measuring meaning in life. *The Journal of Positive Psychology*, 12(6), 613-627.

- George, L. S., & Park, C. L. (2016). Meaning in life as comprehension, purpose, and mattering: toward integration and new research questions. *Review of General Psychology, 20*, 205–220.
- Giovanelli, A., Reynolds, A. J., Mondri, C. F., & Ou, S. R. (2016). Adverse childhood experiences and adult well-being in a low-income, urban cohort. *Pediatrics, 137*(4), e20154016.
- Grusnick, J. M., Garacci, E., Eiler, C., Williams, J. S., & Egede, L. E. (2020). The association between adverse childhood experiences and personality, emotions and affect: Does number and type of experiences matter? *Journal of Research in Personality, 85*, 103908.
- Hayes, A. F. (2016). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling*
- Heintzelman, S.J., & King, L.A. (2019). Routines and Meaning in Life. *Personality and Social Psychology Bulletin, 45*(5), 688–699. <https://doi.org/10.1177/0146167218795133>
- Heintzelman, S.J., & King, L.A. (2014). Life is pretty meaningful. *American Psychologist, 69*, 561-574.
- Heintzelman, S.J., Trent, J., & King, L.A. (2013). Encounters with objective coherence and the experience of meaning in life. *Psychological Science, 24*, 991-998.
- Hill, P. L., Burrow, A. L., & Bronk, K. C. (2016). Persevering with positivity and purpose: An examination of purpose commitment and positive affect as predictors of grit. *Journal of Happiness Studies, 17*(1), 257-269.
- Hinnen, C., Sanderman, R., & Sprangers, M. A. (2009). Adult attachment as mediator between recollections of childhood and satisfaction with life. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice, 16*(1), 10-21.

- Horney, K. (1999). *The Neurotic Personality of Our Time*. Routledge.
- Hughes, K., Lowey, H., Quigg, Z., & Bellis, M. A. (2016). Relationships between adverse childhood experiences and adult mental well-being: results from an English national household survey. *BMC Public Health*, *16*(1), 222.
- Janoff-Bulman, R. (2002). *Shattered Assumptions*. Free Press.
- Janoff-Bulman, R., & McPherson Frantz, C. (1997). *The impact of trauma on meaning: From meaningless world to meaningful life*. In M. J. Power & C. R. Brewin (Eds.), *The transformation of meaning in psychological therapies: Integrating theory and practice* (p. 91–106). John Wiley & Sons Inc.
- Karatekin, C., & Ahluwalia, R. (2020). Effects of adverse childhood experiences, stress, and social support on the health of college students. *Journal of Interpersonal Violence*, *35*(1-2), 150-172.
- King, L. A. (2001). The health benefits of writing about life goals. *Personality and social psychology bulletin*, *27*(7), 798-807.
- King, L. A. (2012). Meaning: Effortless and ubiquitous. In M. Mikulincer & P. Shaver (Eds.), *Meaning, Mortality, and Choice: The Social Psychology of Existential Concerns*. (pp. 129-144). APA.
- King, L.A., & Hicks, J. A. (2021). The science of meaning in life. *Annual Review of Psychology*, *72*, 561–584.
- King, L. A., Hicks, J. A., Krull, J. L., & Del Gaiso, A. K. (2006). Positive affect and the experience of meaning in life. *Journal of Personality and Social Psychology*, *90*(1), 179-196.

- King, L. A., Richards, J. H., & Stemmerich, E. (1998). Daily goals, life goals, and worst fears: Means, ends, and subjective well-being. *Journal of Personality, 66*(5), 713-744.
- Kim, Y., Lee, H., & Park, A. (2021). Patterns of adverse childhood experiences and depressive symptoms: Self-esteem as a mediating mechanism. *Social Psychiatry and Psychiatric Epidemiology*, <https://doi.org/10.1007/s00127-021-02129-2>.
- Kim, Y., Lee, H., & Park, A. (2020). Adverse childhood experiences, economic hardship, and obesity: Differences by gender. *Children and Youth Services Review, 116*, 105214.
- Kohut, H. (1977). *The Restoration of the Self*. University of Chicago Press.
- Krause, N. (2005). Traumatic events and meaning in life: Exploring variations in three age cohorts. *Ageing & Society, 25*(4), 501-524.
- Krause, N., & Hayward, R. D. (2014). Assessing stability and change in a second-order confirmatory factor model of meaning in life. *Journal of Happiness Studies, 15*, 237-253. doi:10.1177/1745691614535936
- Kroger, J. (2006). *Identity development: Adolescence through adulthood*. Sage
- Kruglanski, A. W., Chen, X., Dechesne, M., Fishman, S., Orehek, E. (2009). Fully committed: Suicide bomber's motivation and the quest for personal significance. *Political Psychology, 30*, 331-357.
- Layous, K., Nelson, S. K., & Lyubomirsky, S. (2013). What is the optimal way to deliver a positive activity intervention? The case of writing about one's best possible selves. *Journal of Happiness Studies, 14*(2), 635-654.
- Lehto, K., Karlsson, I., Lundholm, C., & Pedersen, N. L. (2019). Genetic risk for neuroticism predicts emotional health depending on childhood adversity. *Psychological Medicine, 49*(2), 260-267.

- Leppink, J., O'Sullivan, P., & Winston, K. (2017). Evidence against vs. in favour of the null hypothesis. *Perspectives on Medical Education, 6*(2), 115-118.
- Lew, B., Chistopolskaya, K., Osman, A., Huen, J. M. Y., Talib, M. A., & Leung, A. N. M. (2020). Meaning in life as a protective factor against suicidal tendencies in Chinese University students. *BMC Psychiatry, 20*(1), 1-9.
- Liang, F., Paulo, R., Molina, G., Clyde, M.A., & Berger, J. O. (2008), Mixtures of g Priors for Bayesian Variable Selection. *Journal of the American Statistical Association, 103*, 410-423.
- Lin, W. H., & Chiao, C. (2020). Adverse adolescence experiences, feeling lonely across life stages and loneliness in adulthood. *International Journal of Clinical and Health Psychology, 20*(3), 243-252.
- Loveday, P. M., Lovell, G. P., & Jones, C. M. (2018). The best possible selves intervention: A review of the literature to evaluate efficacy and guide future research. *Journal of Happiness Studies, 19*(2), 607-628.
- Markus, H., & Nurius, P. (1986). Possible selves. *American psychologist, 41*(9), 954.
- Martela, F., & Steger, M. F. (2016). The three meanings of meaning in life: Distinguishing coherence, purpose, and significance. *The Journal of Positive Psychology, 11*(5), 531-545.
- Maslow, A. (1968). *Toward a Psychology of Being Human*. Van Nostrand.
- McElroy, S., & Hevey, D. (2014). Relationship between adverse early experiences, stressors, psychosocial resources and wellbeing. *Child Abuse & Neglect, 38*(1), 65–75.
- <https://doi.org/10.1016/j.chiabu.2013.07.017>

- McKnight P.E., & Kashdan T.B. (2009). Purpose in life as a system that creates and sustains health and well-being: An integrative, testable theory. *Review of General Psychology*, *13*(3), 242–51
- McMahon, K., Hoertel, N., Olfson, M., Wall, M., Wang, S., & Blanco, C. (2018). Childhood maltreatment and impulsivity as predictors of interpersonal violence, self-injury and suicide attempts: A national study. *Psychiatry Research*, *269*, 386-393.
- Meevissen, Y. M., Peters, M. L., & Alberts, H. J. (2011). Become more optimistic by imagining a best possible self: Effects of a two week intervention. *Journal of behavior therapy and experimental psychiatry*, *42*(3), 371-378.
- Merrick, M.T., Ford, D.C., Ports, K.A., Guinn, A.S., Chen, J., ...Mercy, J. A. (2019). Vital Signs: Estimated Proportion of Adult Health Problems Attributable to Adverse Childhood Experiences and Implications for Prevention — 25 States, 2015–2017. *MMWR Morbidity and Mortality Weekly Report*, *68*, 999-1005.
DOI: <http://dx.doi.org/10.15585/mmwr.mm6844e1>
- Miller, A. (1981). *The Drama of the Gifted Child*. Basic Books.
- Mittal, C., Griskevicius, V., Simpson, J. A., Sung, S., & Young, E. S. (2015). Cognitive adaptations to stressful environments: When childhood adversity enhances adult executive function. *Journal of Personality and Social Psychology*, *109*(4), 604-621.
- Muller, R. T., Thornback, K., & Bedi, R. (2012). Attachment as a mediator between childhood maltreatment and adult symptomatology. *Journal of Family Violence*, *27*(3), 243-255.
- Murphy, A., Steele, M., Dube, S. R., Bate, J., Bonuck, K., Meissner, P., ... & Steele, H. (2014). Adverse childhood experiences (ACEs) questionnaire and adult attachment interview

- (AAI): Implications for parent child relationships. *Child Abuse & Neglect*, 38(2), 224-233.
- Norem, J. K., & Illingworth, K. S. (1993). Strategy-dependent effects of reflecting on self and tasks: Some implications of optimism and defensive pessimism. *Journal of personality and Social Psychology*, 65(4), 822.
- Park, C. L. (2010). Making sense of the meaning literature: an integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin*, 136(2), 257–301. <https://doi.org/10.1037/a0018301>.
- Pennebaker, J. W., & Susman, J. R. (1988). Disclosure of traumas and psychosomatic processes. *Social Science & Medicine*, 26(3), 327-332.
- Pennebaker, J. W., & Susman, J. R. (2013). *Childhood Trauma Questionnaire*. Measurement Instrument Database for the Social Sciences.
- Pfund, G. N., Bono, T. J., & Hill, P. L. (2020a). A higher goal during higher education: The power of purpose in life during university. *Translational Issues in Psychological Science*, 6(2), 97–106. <https://doi-org.proxy.mul.missouri.edu/10.1037/tps0000231>
- Pfund, G. N., Edmonds, G. W., & Hill, P. L. (2020b). Associations between trauma during adolescence and sense of purpose in middle-to-late adulthood. *International Journal of Behavioral Development*, 44(5), 441-446.
- Pfund, G. N., Ratner, K., Allemand, M., Burrow, A. L., & Hill, P. L. (2021). When the end feels near: sense of purpose predicts well-being as a function of future time perspective. *Aging & Mental Health*, <https://doi.org/10.1080/13607863.2021.1891203>

- Riley, K. E., & Park, C. L. (2014). Problem-focused vs. meaning-focused coping as mediators of the appraisal-adjustment relationship in chronic stressors. *Journal of Social and Clinical Psychology, 33*(7), 587-611.
- Rouder, J. N., & Morey R. D.(2012). Default Bayes factors for Model Selection in Regression. *Multivariate Behavioral Research, 47*, 877-903.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069-1081.
- Samios, C., Raatjes, B., Ash, J., Lade, S. L., & Langdon, T. (2020). Meaning in life following intimate partner psychological aggression: The roles of self-kindness, positive reframing, and growth. *Journal of Interpersonal Violence, 35*(7-8), 1567-1586.
- Silva, J. R., & Greene-Colozzi, E. A. (2019). Fame-seeking mass shooters in America: Severity, characteristics, and media coverage. *Aggression and violent behavior, 48*, 24-35.
- Snyder, C.R., Harris, C., Anderson, J.R., Holleran, S.A., Irving, L.M., Sigmon, S.T., et al. (1991). The Will and the Ways: Development and Validation of an Individual-Differences Measure of Hope. *Journal of Personality and Social Psychology, 60* (4), 570-585.
- Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*(1), 80-93.
- Sumner, R., Burrow, A. L., & Hill, P. L. (2018). The development of purpose in life among adolescents who experience marginalization: Potential opportunities and obstacles. *American Psychologist, 73*(6), 740-752.

- Taylor, S. E. (1989). *Positive illusions: Creative self-deception and the healthy mind*. Basic Books/Hachette Book Group.
- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry, 15*(1), 1-18.
https://doi.org/10.1207/s15327965pli1501_01
- Testa, A., & Jackson, D. B. (2020). Adverse childhood experiences and food insecurity in adulthood: Evidence from the national longitudinal study of adolescent to adult health. *Journal of Adolescent Health, 67*(2), 218-224.
- Thompson S., & Kyle K. (2005). Understanding mass school shootings: Links between personhood and power in the competitive school environment. *Journal of Primary Prevention, 26*, 419-38.
- Tov, W., & Lee, H. W. (2016). A closer look at the hedonics of everyday meaning and satisfaction. *Journal of Personality and Social Psychology, 111*(4), 585–609.
- Triplett, K. N., Tedeschi, R. G., Cann, A., Calhoun, L. G., & Reeve, C. L. (2012). Posttraumatic growth, meaning in life, and life satisfaction in response to trauma. *Psychological Trauma: Theory, Research, Practice, and Policy, 4*(4), 400-410.
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner Jr, T. E. (2010). The interpersonal theory of suicide. *Psychological Review, 117*(2), 575-600.
- Ward, S.J., & King, L.A. (2017). Making Sense: Meaning in Life in a Cognitive Context. In M. D. Robinson & M. Eid (Eds.), *The Happy Mind: Cognitive Contributions to Well-Being*. (pp. 409-425). Springer.

- Ward, S.J. & King, L.A. (2019). Exploring the place of financial status in the Good Life: Income and Meaning in Life. *Journal of Positive Psychology, 14*, 312-323.
doi:10.1080/17439760.2017.1402075
- Weibel, S., Vidal, S., Olié, E., Hasler, R., Torriani, C., Prada, P., Courtet, P., Guillaume, S., Perroud, N., Huguelet, P. (2017). Impact of child maltreatment on meaning in life in psychiatric patients. *Psychiatry Research, 251*, 204–211.
- White, A. E. (2020). Purpose as a Powerful Resource in the Time of COVID-19. *Journal of Humanistic Psychology, 60*(5), 682-689.
- Williams, K. D. (2007). Ostracism. *Annual Review of Psychology, 58*, 425–452. doi: 10.1146/annurev.psych.58.110405.085641
- Winnicott, D.W. (1986). *Home is where we start from*. W.W. Norton.
- Winstanley, E. L., Mahoney III, J. J., Lander, L. R., Berry, J. H., Marshalek, P., Zheng, W., & Haut, M. W. (2020). Something to despair: Gender differences in adverse childhood experiences among rural patients. *Journal of Substance Abuse Treatment, 116*, 108056.
- Womick, J., Ward, S.J., Heintzelman, S.J., Woody, B., & King, L.A. (2019). The Existential Function of Right-wing Authoritarianism. *Journal of Personality, 87*, 1056-1073.
- Womick, J., Woody, B., & King, L. A. (2021). Religious fundamentalism, Right-wing Authoritarianism, and Meaning in Life. *Journal of Personality*. in press.
- Wong, A. E., Dirghangi, S. R., & Hart, S. R. (2019). Self-concept clarity mediates the effects of adverse childhood experiences on adult suicide behavior, depression, loneliness, perceived stress, and life distress. *Self and Identity, 18*(3), 247-266.
- Yalom, I.D. (1980). *Existential Psychotherapy*. Basic Books.

- Young, E. S., Griskevicius, V., Simpson, J. A., Waters, T. E., & Mittal, C. (2018). Can an unpredictable childhood environment enhance working memory? Testing the sensitized-specialization hypothesis. *Journal of Personality and Social Psychology, 114*(6), 891-908.
- Zhang, L., Mersky, J. P., & Topitzes, J. (2020). Adverse childhood experiences and psychological well-being in a rural sample of Chinese young adults. *Child Abuse & Neglect, 108*, 104658.

Table 1. Correlations, descriptive statistics and reliabilities, Study 1

	1	2	3	4	5
1. ACEs	.78				
2. MIL	-.21**	.91			
3. Coh	-.21**	.56**	.79		
4. Sign	-.14**	.69**	.43**	.83	
5. Pur	-.08*	.55**	.54**	.44**	.88
Gender	.13**	.05	-.07**	.12*	.11**
Age	.04	-.02	.02	-.01	.01
<i>M (SD)</i>	1.50 (2.00)	5.87 (1.19)	5.06 (1.13)	4.97 (1.39)	5.59 (1.19)

Note. $N = 1138$; ** $p < .001$, * $p < .01$. ACEs = Adverse Childhood Experiences; MIL = Global Meaning in Life; Coh = Coherence; Sign = Significance; Pur = Purpose. For all scales except ACEs, ratings were made on a scale from 1 (low endorsement) to 7 (high endorsement). Coefficients on the diagonal are reliabilities. Gender was coded 1 = women, 0 = men.

Table 2. Hierarchical Regression Equations Predicting Facets of Meaning from ACEs, Study 1

<i>Predictors</i>	<u>Criteria</u>				
	<i>Coherence</i>	<i>Significance</i>	<i>Purpose</i>	<i>MIL</i>	
<u>Step 1</u>	Step $\Delta R^2 =$	.01*	.02*	.01*	.004
Demographics (age, gender, race)					
<u>Step 2</u>	Step $\Delta R^2 =$	.36**	.24**	.34**	.58**
Significance		.24**	--	.23**	.49**
Coherence		--	.29**	.46**	.22**
Purpose		.44**	.26**	--	.20**
<u>Step 3</u>	Step $\Delta R^2 =$	.01*	.01**	.001	.01**
ACEs		-.12**	-.09**	.03	-.07**
Equation R^2		.26**	.38**	.35**	.58**

Note. Each column represents a regression equation. MIL = global meaning in life. Coefficients are standardized beta weights. ** $p \leq .001$, * $p < .05$. For all equations, tolerance levels for the predictors were $\geq .91$.

Table 3. Correlations, descriptive statistics and reliabilities, Study 2

	1	2	3	4	5	6
1. ACEs	.75					
2. MIL	-.23*	.92				
3. Coh	-.22**	.57**	.78			
4. Sign	-.21**	.64**	.42**	.84		
5. Pur	-.12*	.63**	.55**	.47**	.84	
6. CSS	-.32**	.44**	.39**	.33**	.37**	.92
Gender	.10*	.10*	-.01**	.13**	.07	.05
Age	.03	.00	.00	.03	.02	-.01
<i>M (SD)</i>	1.24 (1.78)	5.78 (1.25)	5.03 (1.10)	4.88(1.41)	5.54 (1.18)	5.52 (1.02)

Note. $N = 707$; ** $p < .001$, * $p < .01$. ACEs = Adverse Childhood Experiences; MIL = Global Meaning in Life; Coh = Coherence; Sign = significance; Pur = Purpose; CSS = Childhood Social Support. For all scales except the ACEs, ratings were made on a scale from 1 (low endorsement) to 7 (high endorsement). Coefficients on the diagonal are reliabilities. Gender was coded 1 = women, 0 = men.

Table 4. Hierarchical Regression Equations Predicting Facets of Meaning from ACEs, Study 2

<i>Predictors</i>	<u>Criteria</u>			
	<i>Coherence</i>	<i>Significance</i>	<i>Purpose</i>	<i>MIL</i>
<u>Step 1</u>	Step $\Delta R^2 =$ <.01	.03**	.01	.01*
Demographics (age, gender, race)				
<u>Step 2</u>	Step $\Delta R^2 =$.33**	.24**	.34**	.56**
Coherence	--	.22**	.42**	.22**
Significance	.20**	--	.29**	.39**
Purpose	.43**	.32**	--	.31**
<u>Step 3</u>	Step $\Delta R^2 =$.02**	.01**	.002	<.01*
ACEs	-.15**	-.12**	.05	-.07*
Equation R^2	.34**	.28**	.35**	.58**

Note. Each column represents a regression equation. Coefficients are standardized beta weights. ** $p \leq .001$, * $p < .05$. For all equations, tolerance levels for the predictors were $\geq .91$. MIL=global meaning in life.

Table 5. Correlations and reliabilities, Study 3

	1	2	3	4	5	6	7	8	9	10
1. ACEs	.79									
2. T-Coh	-.40**	.57								
3. T-Sign	-.47**	.58**	.68							
4. T-Pur	-.40**	.66**	.66**	.56						
5. Avoid	.40**	-.19**	-.40**	-.25**	.91					
6. Anxious	.45**	-.37**	-.45**	-.40**	.49**	.90				
7. PA	-.11**	.32**	.25**	.41**	-.07	-.33**	.82			
8. NA	.08	.03	.01	.06	.05	-.01	.07	.84		
9. Neuroticism	.29**	-.47**	-.44**	-.53**	.31**	.34**	-.53**	-.09*	.95	
10. CTES	.62**	-.44**	-.37**	-.36**	.26**	.26**	-.05	.03	.21**	.49
11. Gender	-.12**	.21**	.08	.13**	.04	.05	.02	.00	-.14**	-.12**
12. Age	-.00	.08	.08	.06	.04	-.08	.15**	.08	-.15**	-.00

Note. $N = 822$; ** $p \leq .001$, * $p < .01$. ACEs = Adverse Childhood Experiences; T-Sign = Trauma-specific Significance; T-Coh = Trauma-specific Coherence; T-Pur = Trauma-specific Purpose; Avoid = Avoidant Attachment; Anxious = Anxious Attachment; PA = positive affect; NA = negative affect; CTES = Average Severity Score from Childhood Traumatic Events Scale. Gender was coded 1 = women; 0 = men. Coefficients on the diagonal are α reliabilities.

Table 6. Hierarchical Regression Equations Predicting the Trauma-related Facets of Meaning, Study 3

<i>Predictors</i>	<u><i>Criteria</i></u>			
	<i>Coherence</i>	<i>Significance</i>	<i>Purpose</i>	
<u>Step 1</u>	Step $\Delta R^2 =$	.06**	.03*	.03*
Demographics				
<u>Step 2</u>	Step $\Delta R^2 =$	.21**	.19**	.29**
Positive Affect		.01	-.05	.14**
Negative Affect		-.00	-.00	.02
Anxious Attachment		-.07	-.10*	-.04
Avoidant Attachment		.11*	-.17**	.04
Neuroticism		-.12**	-.06	-.14**
<u>Step 3</u>	Step $\Delta R^2 =$	.25**	.27**	.28**
Coherence		--	.19**	.35**
Significance		.20**	--	.34**
Purpose		.40**	.40**	--
<u>Step 4</u>	Step $\Delta R^2 =$	.02**	.02**	.001
Childhood Trauma		-.18*	-.05*	-.04
Equation R^2		.54**	.55**	.54**

Note. Each column represents a hierarchical regression equation. The demographic step controlled for age, dummy coded gender, race/ethnicity, and education. Coefficients are standardized beta weights. * $p \leq .003$; ** $p \leq .001$. For all equations, tolerance levels for the predictors were $\geq .67$.

Table 7. Correlations of ACEs with Facet Ratings Within Conditions, Study 4

	Condition	
	Positive Memory	Negative Memory
Coherence	-.26**	-.40**
Significance	-.15*	-.34**
Purpose	-.15*	.33**

Note. $N=381-382$. ACEs ranged from 0-9. * $p \leq .005$; ** $p < .001$.

Table 8. Correlations and reliabilities collapsed across conditions, Study 5.

	1	2	3	4	5	6
1. ACEs	.85					
2. Coherence	.00	.83				
3. Significance	-.05	.78*	.84			
4. Purpose	.02	.85*	.85*	.87		
5. Likelihood	.03	.33*	.26*	.31*	--	
6. Salience	.14*	.21*	.13*	.19*	.32*	.82
Gender	.17*	-.03	.02	.01	-.04	.05

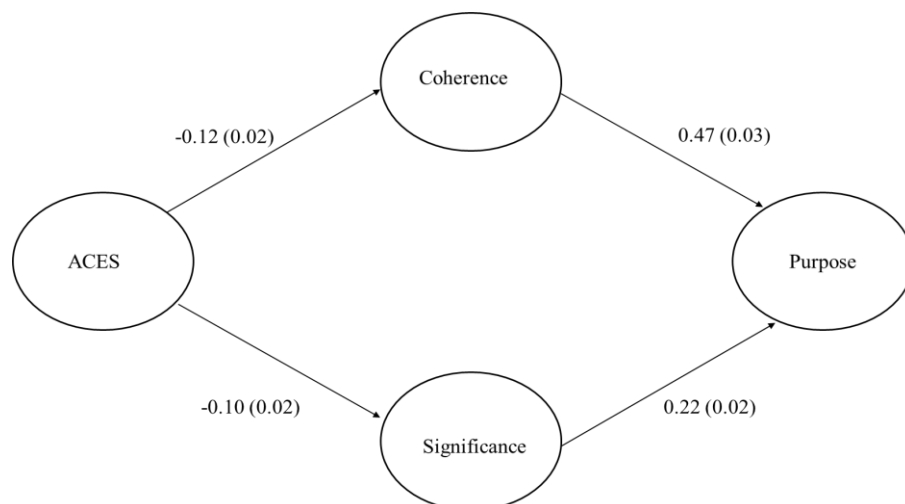
Note. $N = 797$; * $p < .001$. ACEs = Adverse Childhood Experiences; for gender, 1 = women; 0 = men. Coefficients on the diagonal are α reliabilities.

Table 9. Correlations and reliabilities, Study 6

	1	2	3	4	5	6	7	8	9	10	11
1. ACEs	.76										
2. Coh BPS	-.09	.35									
3. Sign BPS	.03	.53**	.53								
4. Pur BPS	.01	.62**	.68**	.60							
5. Likelihood BPS	-.14*	.20**	.16*	.21**	--						
6. Salience BPS	.02	.22**	.20**	.24**	.33**	.87					
7. Coh Plan B	-.08	.13	-.03	.01	.08	.06	.65				
8. Sign Plan B	-.23*	.26**	.28**	.26**	.23**	.11	.54**	.71			
9. Pur Plan B	-.09	.18	.02	.09	.15*	.05	.74**	.63**	.76		
10. Likelihood Plan B	.10	-.10	-.08	-.09	-.13	-.03	.37**	.10	.27**	--	
11. Salience Plan B	.08	-.02	-.04	-.002	.02	.26**	.37**	.11	.31**	.44**	.77
12. Gender	.18**	.09	.19**	.15*	-.10	-.02	-.17*	.002	-.12	-.13	-.15*

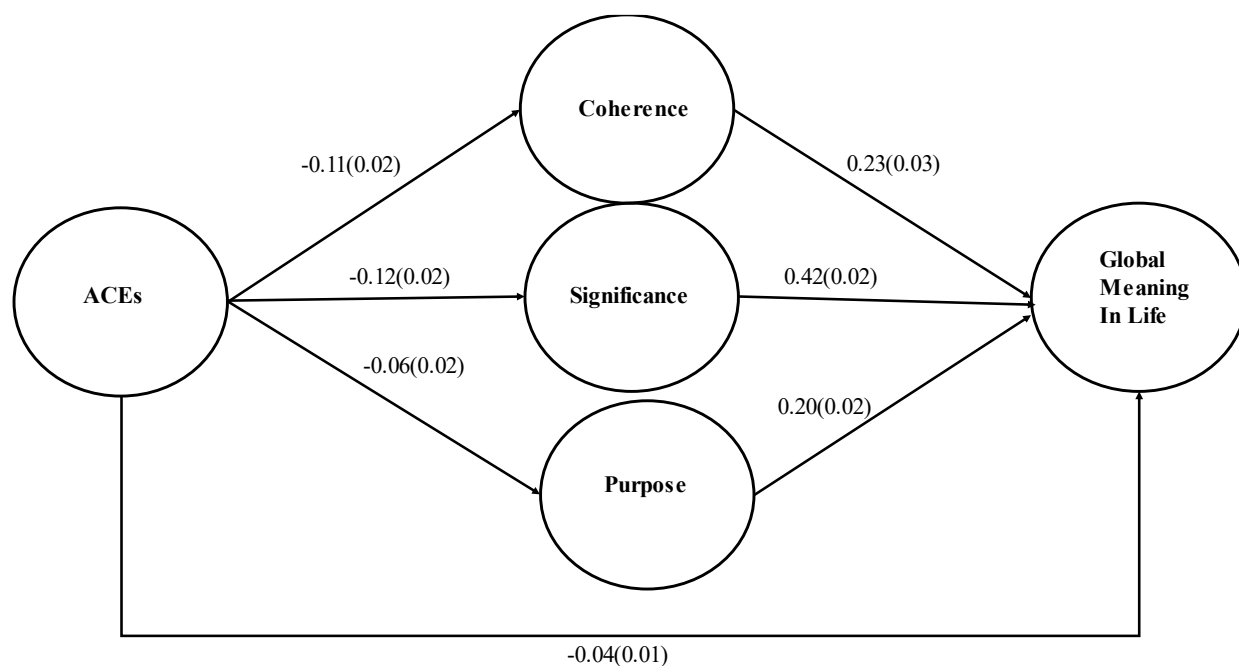
Note., $N = 346$; ** $p \leq .001$, * $p < .01$. ACEs = Adverse Childhood Experiences; Coh BPS = Best Possible Self Coherence; Sign BPS = Best Possible Self Significance; Pur BPS = Best Possible Self Purpose; Coh Plan B = Plan B Possible Self Coherence; Sign Plan B = Plan B Possible Self Significance; Pur Plan B = Plan B Possible Self Purpose; Gender was coded 1 = women; 0 = men. Coefficients on the diagonal are α reliabilities.

Figure 1. Mediation model predicting purpose from ACEs through the significance and coherence, controlling for demographics, Study 1



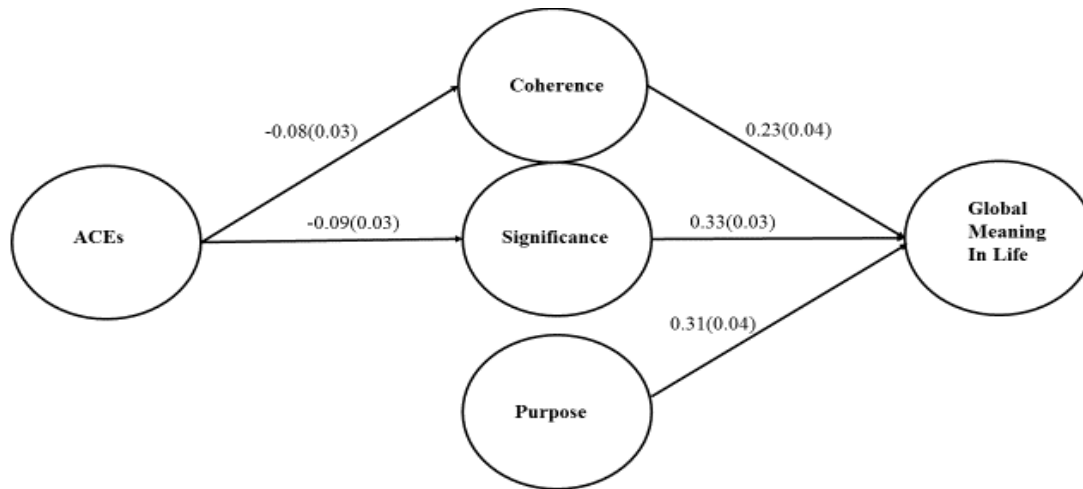
Note. $N = 391$. ACEs = adverse childhood experiences. Path coefficients are unstandardized $b(SE)$'s. All paths are significant, $p < .001$

Figure 2. Predicting global meaning in life from ACEs through the facets of meaning, controlling for demographics, Study 1.



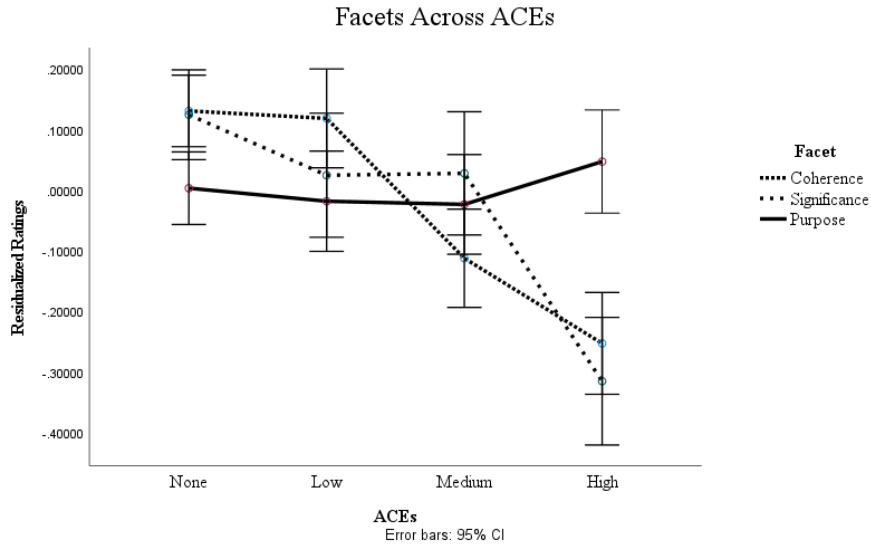
Note. ACEs = adverse childhood experiences. Path coefficients are unstandardized $b(SE)$'s. All paths are significant, $p < .001$.

Figure 3. Mediation model predicting global meaning in life from ACEs through the facets of meaning, Study 2



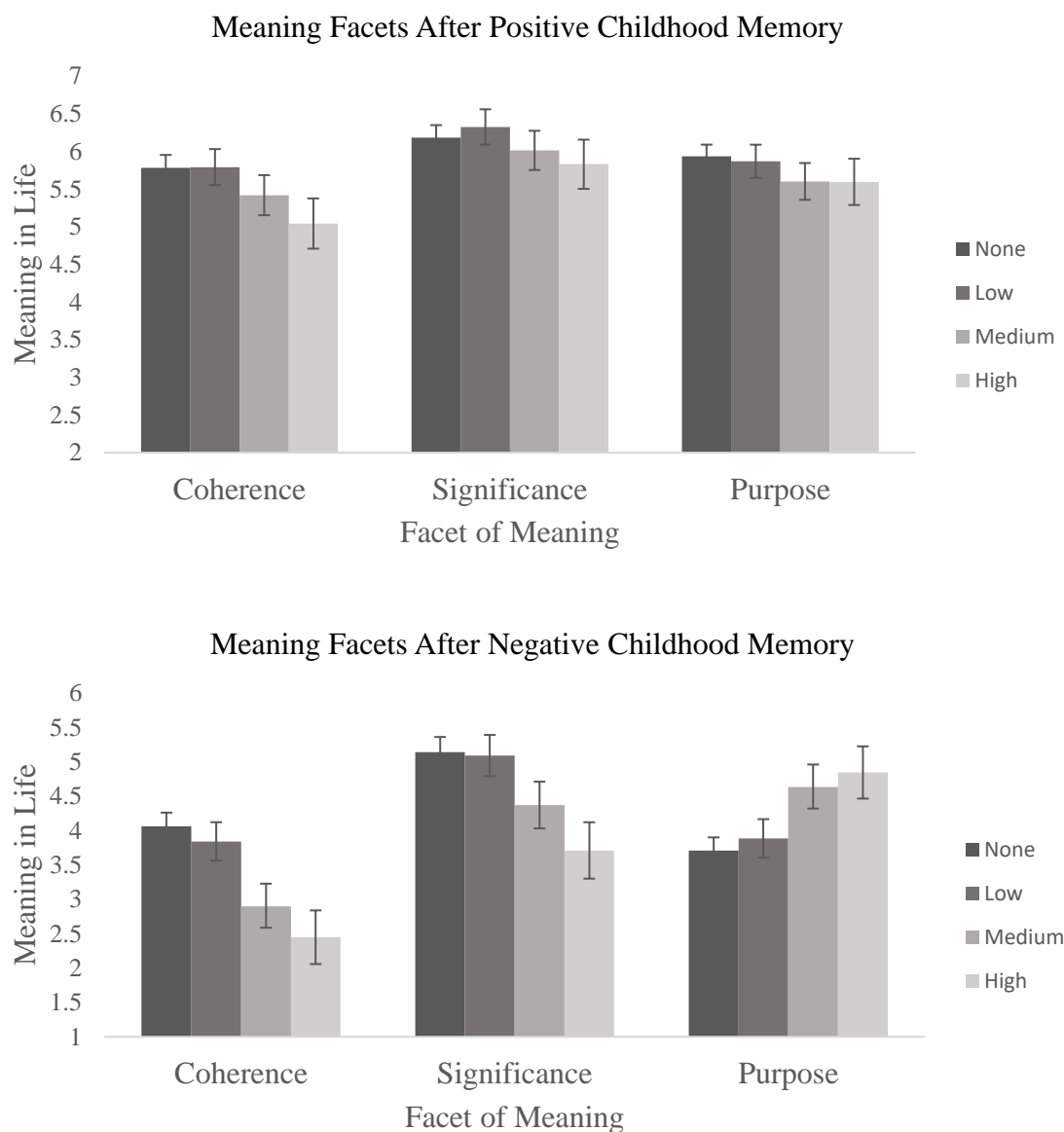
Note. ACEs = adverse childhood experiences. Path coefficients are unstandardized $b(SE)$'s. Demographics and childhood social support are entered as covariates. Only significant paths are shown, all p 's < .001.

Figure 4. Facets ratings across ACEs, pooled across Studies 1-3



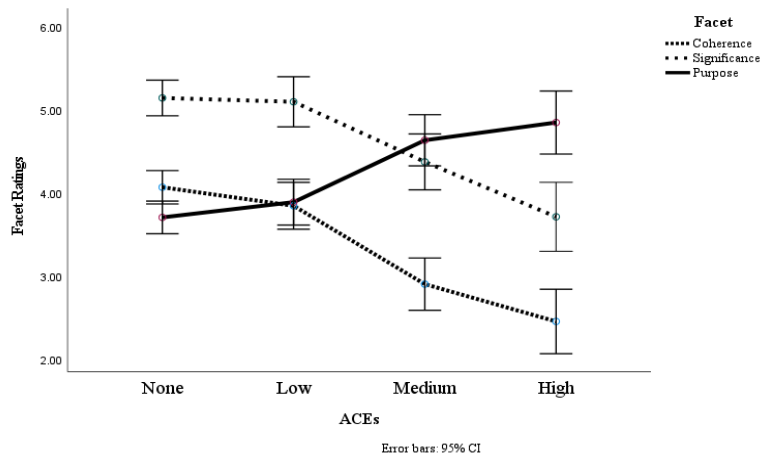
Note. Facet ratings regressed on the other two facets. The figure displays results for these residualized scores; *n*'s for each level of ACEs: None = 1,033; Low = 541; Medium = 548; High = 511.

Figure 5. Facets of meaning after writing about a positive vs. negative memory by ACEs, Study 4.



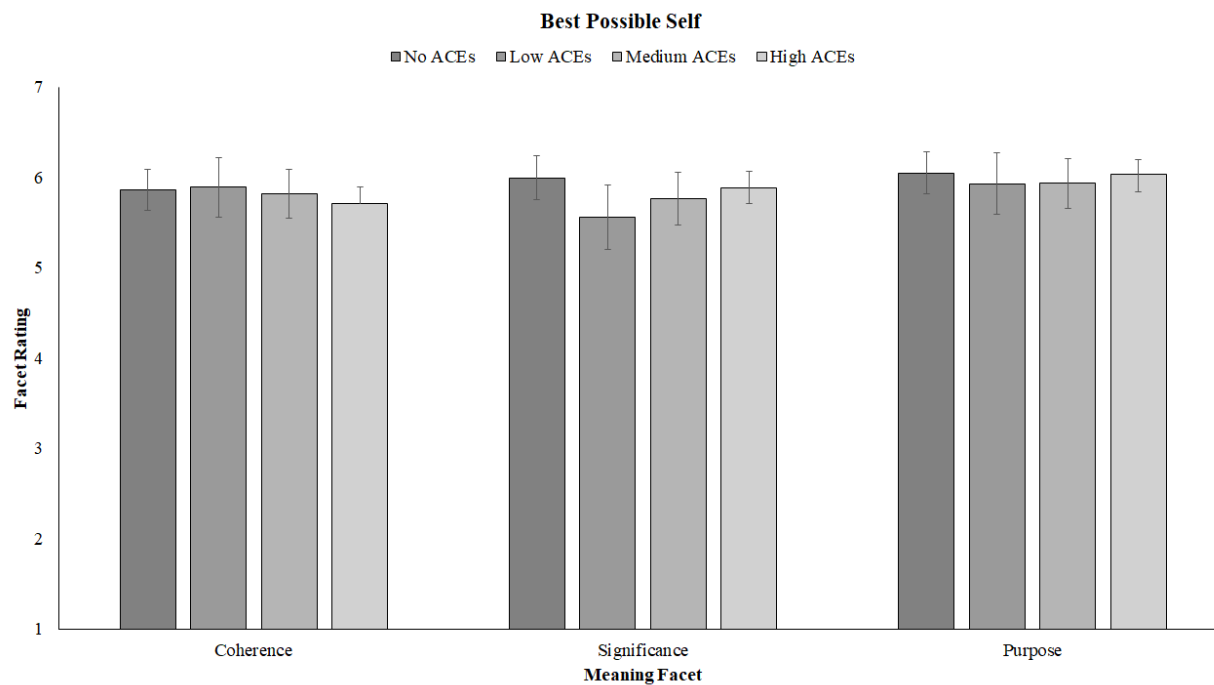
Note. $N = 380$. Bars represent ACEs groups categorized as None ($n = 173$); Low ($n = 88$); Medium ($n = 73$); High ($n = 46$).

Figure 6. Facet ratings in the negative memory condition across ACEs, Study 4



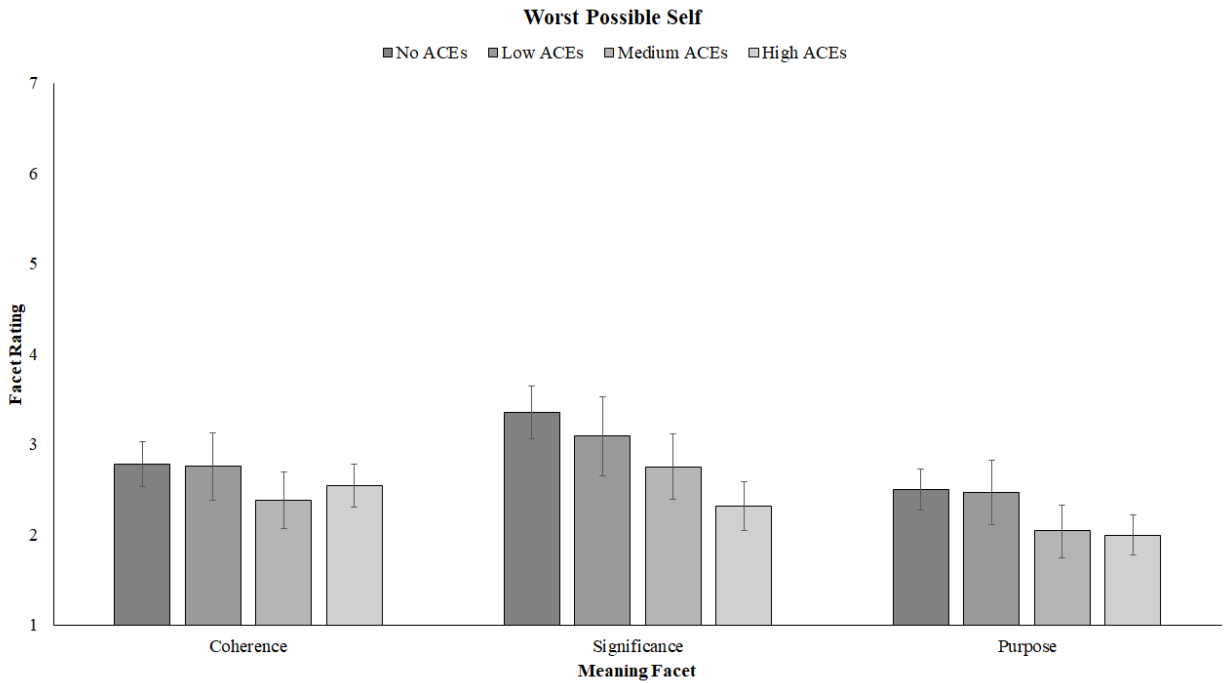
Note. Cell *n*'s for each level of ACEs: None = 173; Low = 88; Medium = 73; High = 47. The facet X ACEs interaction is significant, $F(3, 377) = 27.41, p < .001, d = 0.94$.

Figure 7. Facets of meaning after writing about best possible future self by ACEs, non-college sample, Study 5.



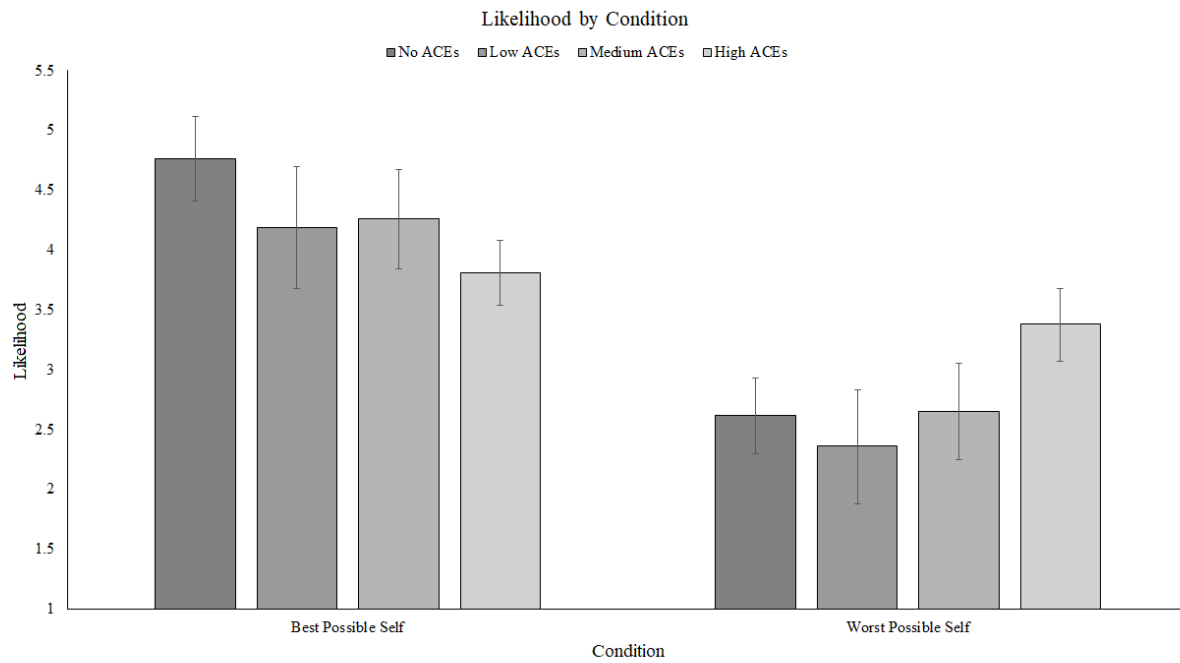
Note. For ACEs groups, None, ($n = 102$); Low (1, $n = 48$); Medium (2-3), $n = 72$; and High (> 4 , $n = 174$). Error bars are 95% Confidence Intervals.

Figure 8. Facets of meaning after writing about worst possible future self by ACEs, non-college sample, Study 5.



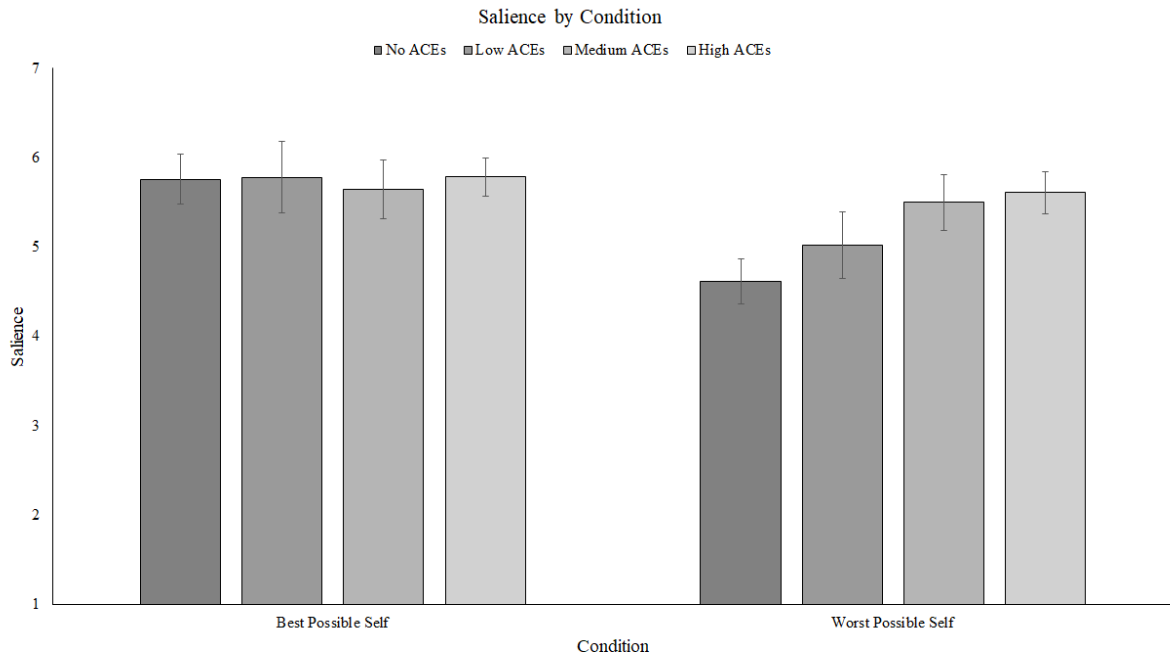
Note. For ACEs groups, None, ($n = 127$); Low (1, $n = 55$); Medium (2-3), $n = 79$; and High (> 4 , $n = 136$). Error bars are 95% Confidence Intervals.

Figure 9. Likelihood of future self by ACEs and condition.



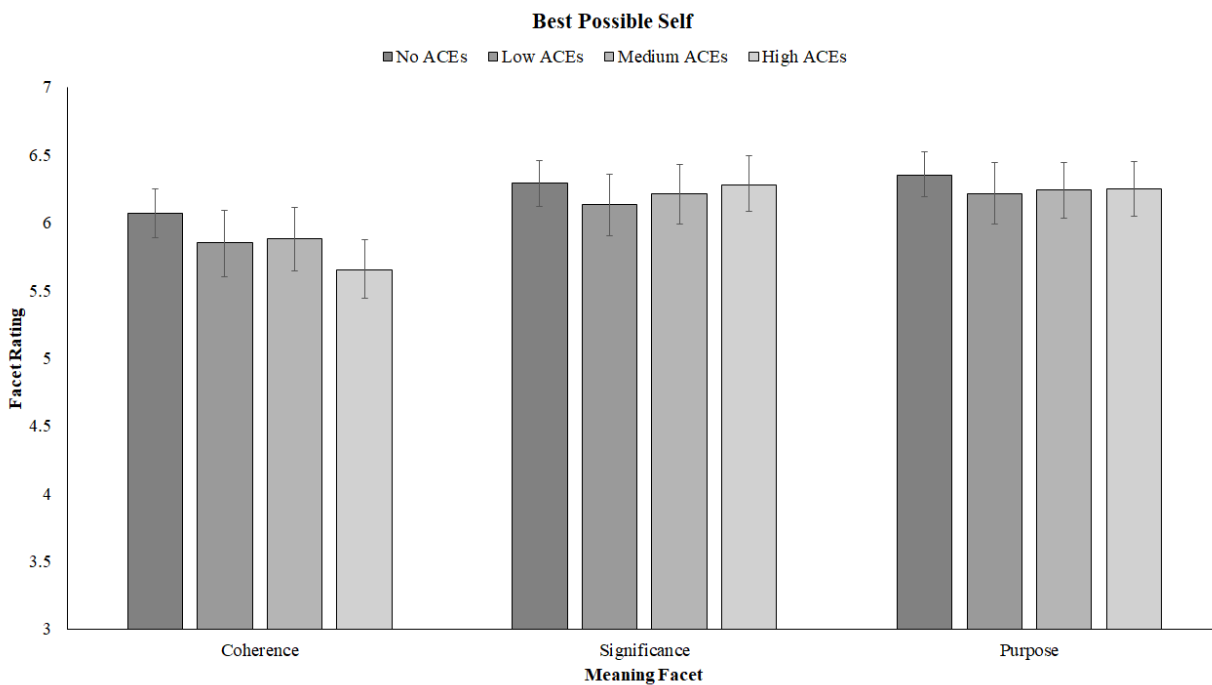
Note. Error bars are 95% Confidence Intervals.

Figure 10. Salience of future self by ACEs and condition.



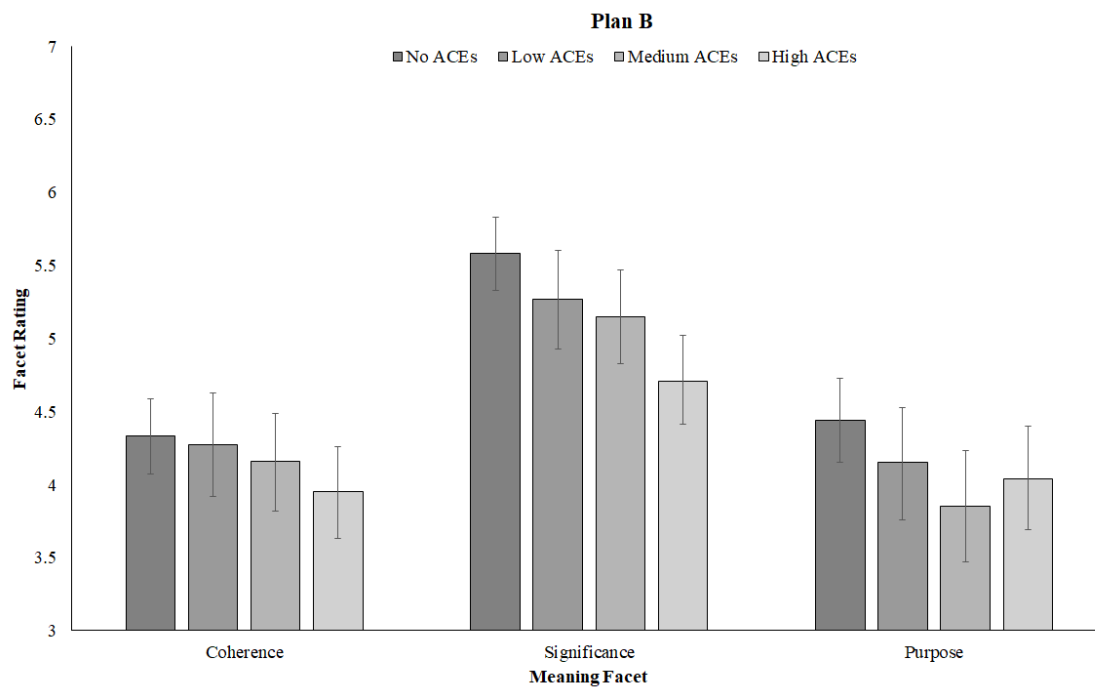
Note. Error bars are 95% Confidence Intervals.

Figure 11. Facets of meaning after writing about best possible future self by ACEs, Study 6.



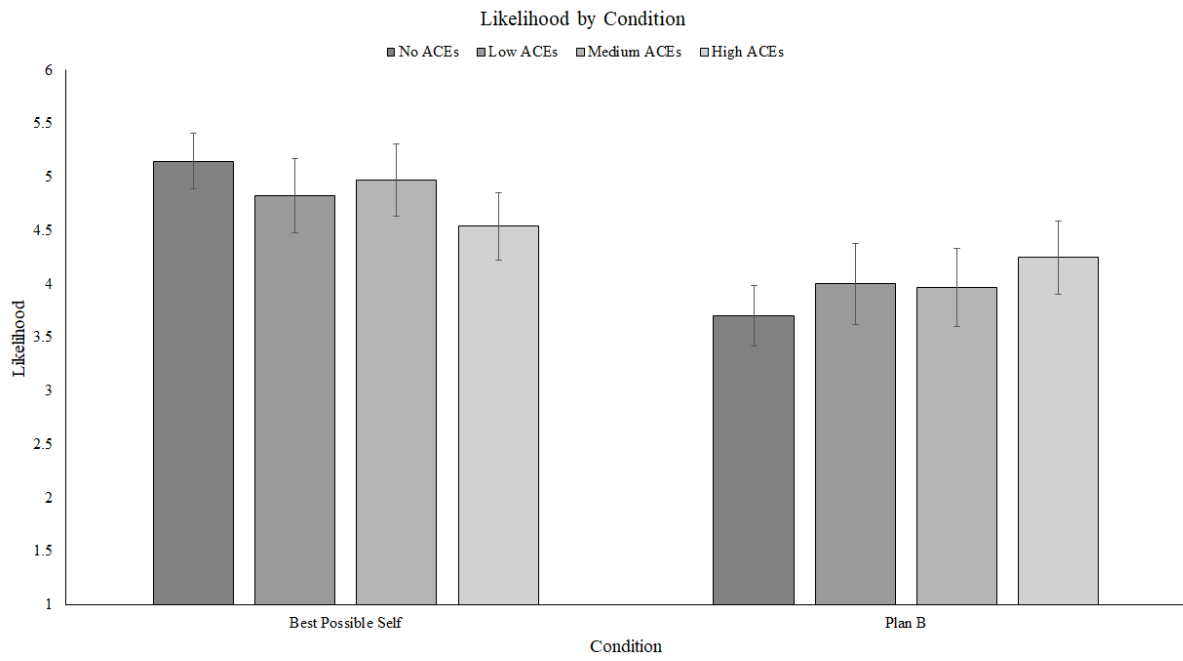
Note. For ACEs groups, None, ($n = 122$); Low (1, $n = 68$); Medium (2-3), $n = 73$; and High (> 4 , $n = 83$). Error bars are 95% Confidence Intervals.

Figure 12. Facets of meaning after writing about Plan B by ACEs, Study 6.



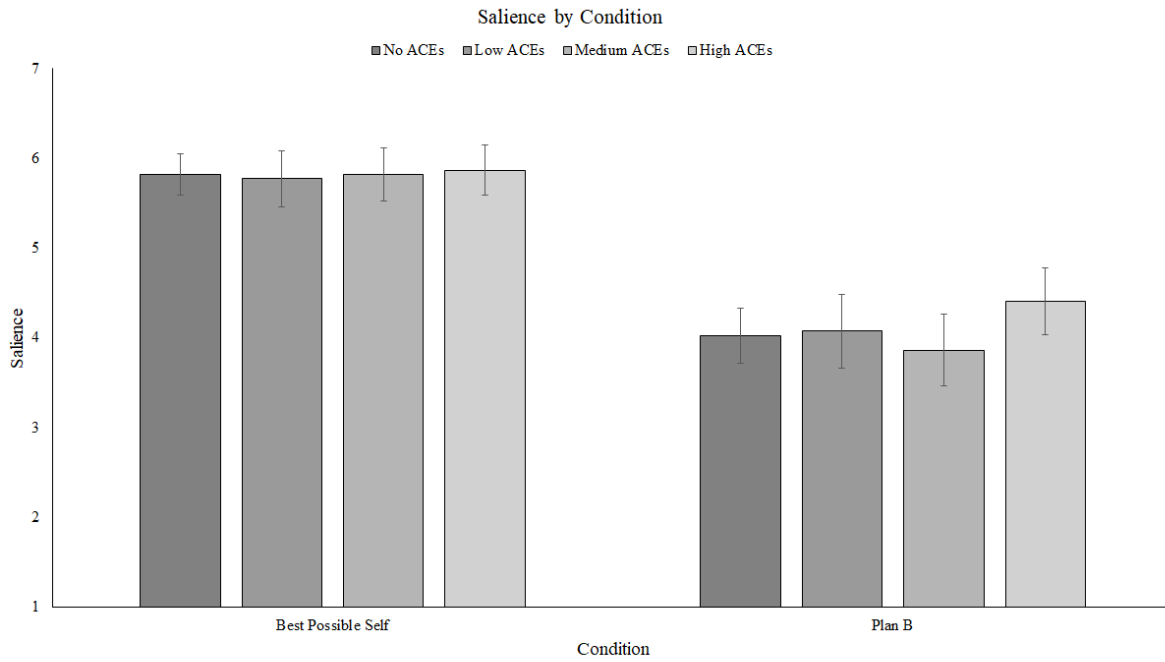
Note. For ACEs groups, None, ($n = 122$); Low (1, $n = 68$); Medium (2-3), $n = 73$; and High (> 4 , $n = 83$). Error bars are 95% Confidence Intervals.

Figure 13. Likelihood of future self by ACEs and condition.



Note. Error bars are 95% Confidence Intervals.

Figure 14. Salience of future self by ACEs and condition.



Note. Error bars are 95% Confidence Intervals.