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The Continuity of Adversity: Negative Emotionality Links Early Life Adversity With Adult Stressful Life Events

Grace M. Brennan[1,2], Terrie E. Moffitt[1,2,3,4], Kyle J. Bourassa[5], HonaLee Harrington[2], Sean Hogan[6], Renate M. Houts[2], Richie Poulton[6], Sandhya Ramrakha[6], and Avshalom Caspi[1,2,3,4]

[1]Duke Aging Center, Duke University School of Medicine; [2]Department of Psychology & Neuroscience, Duke University; [3]Institute of Psychiatry, King's College London; [4]Promenta, University of Oslo; [5]Geriatric Research, Education, and Clinical Center, Durham VA Healthcare System, Durham, North Carolina; and [6]Department of Psychology and Dunedin Multidisciplinary Health and Development Research Unit, University of Otago

Abstract

Adversity that exhibits continuity across the life course has long-term detrimental effects on physical and mental health. Using 920 participants from the Dunedin Study, we tested the following hypotheses: (a) Children (ages 3–15) who experienced adversity would also tend to experience adversity in adulthood (ages 32–45), and (2) interim personality traits in young adulthood (ages 18–26) would help account for this longitudinal association. Children who experienced more adversity tended to also experience more stressful life events as adults, $\beta = 0.11$, 95% confidence interval [CI] = [0.04, 0.18], $p = .002$. Negative emotionality—particularly its subfacet alienation, characterized by mistrust of others—helped explain this childhood-to-midlife association (indirect effect: $\beta = 0.06$, 95% CI = [0.04, 0.09], $p < .001$). Results were robust to adjustment for sex, socioeconomic origins, childhood IQ, preschool temperament, and other young-adult personality traits. Prevention of early life adversity and treatment of young-adult negative emotionality may reduce vulnerability to later life stress and thereby promote the health of aging adults.

Keywords

adversity, stress, personality, negative emotionality, alienation

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Adversity across the life course has deleterious impacts on a wide range of important outcomes, including physical health, mental health, and aging (Baniya & Rai, 2022; Klopack et al., 2022). It is well established that adversity experienced during childhood predicts later physical- and mental-health problems, stretching decades into adulthood (Baldwin, Sallis, et al., 2023; Bourassa, Moffitt, et al., 2023; Felitti et al., 1998; Gilbert et al., 2015; Hamby et al., 2021; Reuben et al., 2016). The harmful effects of adversity are not limited to early life adversity, however; adversity experienced in adulthood is also associated with poorer health outcomes (Iacovino et al., 2016; Mann et al., 2021; Mitchell et al., 2020). It stands to reason, then, that individuals who are exposed to heightened adversity across both childhood and adulthood would be at greatest risk for poor physical- and mental-health outcomes. Indeed, theories of cumulative stress posit that individuals who experience more adversity across the entire life course are at greatest risk for disease (McEwen, 2003; Vinkers et al., 2014).

Despite the health implications of lifelong adversity, few studies have taken a cumulative, life-span-developmental approach to elucidate pathways from childhood

Corresponding Author:
Grace Brennan, Duke Aging Center, Duke University School of Medicine
Email: grace.brennan@duke.edu

adversity to adulthood adversity. Disparate bodies of literature have commented on the tendency for stressors to co-occur and reoccur (e.g., the chaining of adversity among individuals of low socioeconomic status [SES], Pearlin et al., 2005; reenactment among trauma-exposed psychotherapy patients, Levy, 1998; revictimization of childhood sexual-abuse survivors, Messman-Moore & Long, 2003). Consistent with these observations, recent quantitative evidence points to an overarching "s-factor" that represents the tendency for different dimensions of stress to co-occur in adulthood (Mann et al., 2021). However, little research has examined the extent to which cumulative adversity in childhood is prospectively associated with cumulative adversity in adulthood, in which "cumulative" refers to the totality of adversity across a broad range of types as opposed to a single type (e.g., being a victim of sexual abuse) or a restricted range of types.

Because adversity that is continuous across the life course is likely to have the most devastating effects on health, it is important to identify factors that help explain why individuals who have stressful childhoods go on to have stressful adult lives as well. Such factors may represent a chain that can be broken, or at least weakened, thus disrupting the proliferation of adversity across the life span and improving health and well-being in adulthood. Although some research has considered the role of societal-level factors in the continuity of adversity across the life course (Pearlin et al., 2005), almost no research has focused on the potential role of individual-level psychological factors.

Among individual-level psychological factors, personality traits represent a promising candidate for helping to explain the potential association between early-life and later-life adversity. First, personality traits exhibit both continuity and change across the life course (Roberts & Caspi, 2003) and are influenced by life experiences (e.g., Roberts et al., 2003). Thus, although malleable, they may be more reliable indicators of risk for poor health outcomes than, for example, any single, discrete psychiatric diagnosis (Strickhouser et al., 2017; Waszczuk et al., 2022). Although a sizable body of research has focused on the association between childhood adversity and later psychiatric disorders (Baldwin, Wang, et al., 2023), far less research has investigated the association between childhood adversity and later personality traits. Nevertheless, previous research has suggested individual links between early life adversity and later personality, on the one hand, and personality and later adversity, on the other hand. For example, research and theory on the effects of early life stress suggest that childhood adversity has long-term impacts on cognitive, affective, and biological functioning (Lambert et al., 2017; Slavich, 2020) and personality (Cicchetti, 2016; Shiner et al., 2017). More specifically, children who experienced maltreatment have been shown to exhibit lower agreeableness, conscientiousness, and openness to experience; higher neuroticism; and increased risk for developing personality disorders (Rogosch & Cicchetti, 2004, 2005). Likewise, research and theory on stress generation (Hammen, 1991) suggest that individuals with certain characteristics, including personality traits such as neuroticism (also referred to as negative emotionality), are more likely to experience stressful life events (SLEs) that are dependent in nature (i.e., events in which the individual could have played some role, such as divorce; Allen et al., 2022; Conway et al., 2012). Although most previous studies on the associations between personality and adversity have focused exclusively on neuroticism/negative emotionality, far fewer studies have examined other personality traits.

Second, personality traits are not only malleable by life experiences; they are also amenable to intervention and thus represent modifiable risk factors (Roberts et al., 2017; Stieger et al., 2021). Consistent with the growing recognition of tremendous overlap shared across psychiatric disorders and the movement toward a more dimensional conceptualization of psychopathology (Ringwald et al., 2023), emerging evidence suggests that personality (i.e., trait neuroticism) is responsive to transdiagnostic psychological treatment (Sauer-Zavala et al., 2021). Taken together, the role of personality traits as modifiable risk factors linking early life adversity to adversity in adulthood deserves to be better understood.

In the present study, we sought to fill these gaps by pursuing two primary aims: (a) to quantify the association between prospectively ascertained adversity in childhood and SLEs in adulthood to midlife, above and beyond any contributions of sex, socioeconomic origins, and childhood IQ and (b) to test whether personality traits in young adulthood mediate the association between childhood adversity and adulthood-to-midlife SLEs, above and beyond any contributions of sex, socioeconomic origins, childhood IQ, and age-3 temperament. We tested mediation by a comprehensive set of personality traits: negative emotionality, positive emotionality, and constraint, the three personality superfactors assessed by the Multidimensional Personality Questionnaire (MPQ; Patrick et al., 2002). Adjusting for age-3 temperament allowed us to test whether experiencing childhood adversity was associated with later personality (e.g., heightened negative emotionality) above and beyond what would be expected based on participants' earliest emerging manifestations of personality (e.g., "undercontrolled" temperament, which has been shown in this sample to predict differences in young-adult personality, including heightened negative emotionality; Caspi,

Harrington, et al., 2003). As a supplementary aim, we also tested whether associations were strongest for the totality of adverse childhood experiences (ACEs), consistent with the cumulative approach to conceptualizing childhood adversity (e.g., Felitti et al., 1998), or instead differed according to two distinct dimensions of childhood adversity proposed in a newer model of early life stress—threat (i.e., experiences that represent significant threats to safety or well-being, such as physical abuse) versus deprivation (i.e., experiences that represent a lack of expected environmental input, such as physical neglect; McLaughlin & Sheridan, 2016).

This study is uniquely positioned to provide novel insights about the continuity of adversity across the life course because of its: (a) prospective longitudinal design (including prospective ascertainment of childhood adversity); (b) 5-decade time frame of study, from birth to midlife; (c) repeated assessments of the same construct over time to form more stable estimates (e.g., of personality traits); (d) measurement of each construct at nonoverlapping time points to prevent contemporaneous difficulties from biasing participants' reporting across multiple study variables; and (e) use of multiple methods of personality assessment (i.e., self-report and informant report) to allow for conceptual replication of findings. Most previous research on long-term outcomes associated with childhood adversity has used cross-sectional designs and retrospective reports of childhood adversity. However, adversity retrospectively reported in adulthood exhibits only modest correspondence with adversity prospectively ascertained in childhood (Baldwin et al., 2019). Moreover, the reliability of adults' retrospective reports of their childhood experiences has been questioned, based in part on evidence that these reports are influenced by current mental-health difficulties (Colman et al., 2016). In contrast, all of the unique design elements of the present study noted above help minimize the role of self-report biases in explaining potential associations among early adversity, young-adult personality, and later adversity.

We hypothesized the following:

Hypothesis 1: Prospectively ascertained adversity in childhood would be positively associated with SLEs in adulthood, above and beyond any contributions of sex, socioeconomic origins, and childhood IQ.

Hypothesis 2: Personality traits in young adulthood would mediate the association between childhood adversity and adulthood-to-midlife SLEs, above and beyond any contributions of sex, socioeconomic origins, childhood IQ, and early temperament.

More specifically, we expected that heightened negative emotionality and diminished constraint would mediate the association between childhood adversity and adult SLEs, based on previous research (Allen et al., 2022; McFarlane et al., 2005; Roberts et al., 2007; Shiner et al., 2017). Because of a lack of prior research on the topic, we did not have a specific hypothesis regarding whether associations would be strongest for cumulative ACEs (Felitti et al., 1998) or instead would differ according to the dimensions of threat versus deprivation (McLaughlin & Sheridan, 2016).

Transparency and Openness

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. The premise and analysis plan for this project were preregistered at https://sites.duke.edu/moffittcaspiprojects/files/2022/12/Brennan_ChildAdultStress_DEC2022.pdf. This study involved an analysis of existing data rather than new data collection. Custom code that supports the findings of this study is available at https://osf.io/f692p/. The Dunedin Study data sets are available on request by qualified scientists. Requests require a concept paper describing the purpose of data access, ethical approval at the applicant's university, and provision for secure data access (https://moffittcaspi.trinity.duke.edu/research-topics/dunedin). We offer secure access on the Duke, Otago, and King's College campuses. For supplemental analyses, tables, and figures, see the Supplemental Material available online. Results reported here were checked for reproducibility by an independent data analyst, who recreated the code by working from the manuscript and applying it to a fresh copy of the data set.

The Dunedin Study was approved by the New Zealand Health and Disability Ethics Committee. The study protocol was approved by the institutional ethical review boards of the participating universities and was carried out in accordance with the provisions of the World Medical Association Declaration of Helsinki. Study members (or their legal guardian when they were children) gave written informed consent before each assessment.

Method

Participants

Participants were members of the Dunedin Longitudinal Study, a representative birth cohort (N = 1,037; 91% of eligible births; 51.6% male) born between April 1972 and March 1973 in Dunedin, New Zealand, who were eligible based on residence in the province and who participated in the first assessment at age 3 (Poulton et al., 2015, 2023). The cohort represented the full range of SES in the general population of New Zealand's

South Island and, in adulthood, matches the New Zealand National Health & Nutrition Survey on key health indicators (body mass index, smoking, physical activity, doctor visits; Poulton et al., 2015) and the New Zealand census on educational attainment (Richmond-Rakerd et al., 2020). The cohort consists primarily of White participants (93%), matching South Island demographics (Poulton et al., 2015). Assessments were carried out at birth and ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, 32, 38, and most recently (completed April 2019), 45 years, when 938 of the 997 living cohort members (94.1%) took part. From the cohort, 920 (88.7% of the original cohort, 92.3% of the cohort who remained alive at age 45) met inclusion criteria for the present study by having data available for adult SLEs at both age 38 and age 45.

Measures

Exposure to childhood adversity. Prospectively ascertained ACEs scores were generated from records gathered during seven biennial assessments carried out from ages 3 to 15, including (a) social-service contacts; (b) structured notes from interviewers, pediatricians, psychometricians, and nurses who assessed Dunedin Study children and their parents; (c) teachers' notes of concern; and (d) parental questionnaires, as previously described (Reuben et al., 2016). Records were reviewed by four independent raters from the Dunedin Study team and coded according to 10 categories of ACEs introduced by the CDC–Kaiser ACE Study (Centers for Disease Control and Prevention [CDC], 2021; Felitti et al., 1998): five types of child harm (physical abuse, emotional abuse, physical neglect, emotional neglect, and sexual abuse) and five types of household dysfunction (incarceration of a family member, household substance abuse, household mental illness, loss of a parent, and household partner violence). The number of these adversities experienced yielded a cumulative ACEs score ($M = 1.05$, $SD = 1.19$). In line with the CDC–Kaiser ACE Study (Felitti et al., 1998), values of 5 or more were recoded as 4. Interrater agreement across all ACEs averaged a κ of .79 (range = .76–.82; Reuben et al., 2016). The distribution of ACEs for Dunedin Study members resembled that observed in the CDC–Kaiser ACE Study (see Reuben et al., 2016).

ACEs were also grouped according to an emerging model of early life stress (McLaughlin & Sheridan, 2016), which distinguishes between experiences involving threat versus deprivation. Following previous research (Gehred et al., 2021), we operationalized exposure to threat as the sum of the physical abuse, emotional abuse, sexual abuse, and witnessing domestic violence ACE items; exposure to deprivation was operationalized as the sum of the physical neglect, emotional neglect, and parental loss ACE items. For each category, values of 3 or more were recoded as 2 because very few study members ($N = 4$ and $N = 9$, respectively) had three or more ACEs in either category.

Young-adult personality traits.

Self-reported personality traits. Self-reported personality traits were assessed at ages 18 and 26 using the brief form of the Multidimensional Personality Questionnaire (MPQ-BF; Patrick et al., 2002; Tellegen et al., 1988), which was developed and standardized with nonclinical populations, has established reliability and validity, and yields a comprehensive profile of personality dimensions that are partially heritable, predictable from childhood, and very stable from adolescence to adulthood (Caspi & Silva, 1995; McGue et al., 1993). Ten primary scales make up three higher-order superfactors: negative emotionality, positive emotionality, and constraint (Tellegen & Waller, 2008). The negative emotionality superfactor consists of the alienation, aggression, and stress-reaction scales; individuals scoring high on negative emotionality have a low threshold for the experience of negative emotions, such as fear, anxiety, and anger. Positive emotionality consists of the well-being, social potency, social closeness, and achievement scales; individuals scoring high on positive emotionality have a low threshold for the experience of positive emotions and tend to view life as an essentially pleasurable experience. Constraint consists of the control, harm-avoidance, and traditionalism scales; individuals scoring high on constraint tend to act in a cautious and restrained manner, avoid thrills, and endorse and conform to social norms. Personality trait scores were calculated by averaging age-18 and age-26 scores on each superfactor.

Informant-reported personality traits. As reported previously (see Israel et al., 2014), informant-reported personality traits were assessed at age 26 using a brief version of the Big Five Inventory (Benet-Martínez & John, 1998), which assesses individual differences in agreeableness, neuroticism, conscientiousness, extraversion, and openness to experience. Study members nominated someone who knew them well; most were best friends, partners, or other family members. These informants were mailed questionnaires asking them to describe the study member. We used the informant-reported personality variables to conduct a conceptual replication in the event of any significant effects detected for self-reported personality variables because we wanted to rule out self-report biases as an alternative explanation for any associations between personality and adult SLEs.

Adult SLEs. The number of SLEs that participants experienced from age 32 through 44 was assessed using a life-history calendar (Caspi et al., 1996), as previously

described (Bourassa et al., 2021). Participants reported on the SLEs they had experienced since the previous study assessment at two time points in adulthood: (a) at age 38—when they reported on the period from age 32 through 37 and (b) at age 45—when they reported on the period from age 38 through 44. Events were coded to provide a count of (a) each breakup; (b) whether someone moved frequently (10 or more moves; see Caspi, Sugden, et al., 2003); (c) homelessness during the assessment period; (d) incarceration during the assessment period; (e) the death of a friend or family member; (f) a job loss; (g) experiencing a medical illness, mental illness, injury, or accident; (h) a friend or family member experiencing a medical illness, mental illness, injury, or accident; (i) legal problems; (j) a physical or sexual assault; (k) serious financial problems; and (l) a natural or human-made disaster (e.g., fire, earthquake). Events across these categories were summed for each of the two study periods. These totals were then winsorized to a maximum of 30 events within each period and then summed to create the total-adult-SLEs variable (M = 11.88, SD = 9.00). The measure evidenced strong interrater reliability—percent agreement = 92.2%, κ = .91 (Bourassa et al., 2021).

Additional measures. We selected other potential risk factors to include as covariates based on theory and documented associations with adversity and personality: childhood SES (Lantz et al., 2005), childhood IQ (Breslau et al., 2006), and temperament assessed via behavior ratings based on observation of study members at age 3 (see Caspi et al., 1995). The temperament variables were approach (i.e., the tendency to explore in new situations), sluggishness (i.e., passivity and withdrawal), and lack of control (i.e., impulsivity, distractibility, and irritability).

Statistical analysis

We conducted a series of regression and mediation analyses using full maximum likelihood estimation and bootstrapping (N = 5,000) in Mplus (Version 8.7; Muthén & Muthén, 1998–2017). We adjusted for sex in all analyses. First, we tested whether ACEs predicted more SLEs in adulthood (i.e., ages 32–45). To test whether childhood SES or childhood IQ could explain this association, we then adjusted for these risk factors as well. In addition, because it is unclear whether low SES is better conceptualized as an ACE or as a separate risk factor, sensitivity analyses examined its effects as both a predictor (i.e., part of the ACEs measure) and a covariate (see eAppendix 1 in the Supplemental Material).

Second, we tested whether personality traits in young adulthood (i.e., ages 18–26)—measured by the MPQ superfactors negative emotionality, positive emotionality, and constraint—mediated the association between ACEs and adult SLEs. We tested each personality superfactor individually and then simultaneously (i.e., in parallel mediation models). All mediators were allowed to freely covary with one another in the parallel mediation models. In addition to adjusting for sex, childhood SES, and childhood IQ in mediation analyses, we also adjusted for age-3 temperament to model whether ACEs predicted young adult personality above and beyond the effects of temperament, an early life foundation of adult personality traits (Caspi, Harrington, et al., 2003). As a secondary analysis, we followed up on any significant effects by examining associations at the level of the MPQ primary scales (i.e., the individual subfacets that make up the MPQ personality superfactors). In addition, we sought to replicate any personality effects using informant reports of personality as well. Finally, we tested whether distinct dimensions of ACEs (i.e., threat vs. deprivation) differentially predicted adult SLEs and whether potential associations were mediated by young-adult personality traits. We present standardized regression coefficients (β) and 95% confidence intervals (CIs) for all associations.

Results

Of the 1,037 original Dunedin Study members, 920 (92.3% of cohort members alive at age 45) met inclusion criteria for the present study by having data available for SLEs at both age 38 and age 45. For full correlations among study variables of interest, see Table S1 in the Supplemental Material. Attrition analyses comparing the full cohort, participants alive at age 45, and the study sample showed no differences in childhood IQ and childhood SES among these groups, suggesting differential attrition was not responsible for observed associations (Fig. S1 in the Supplemental Material).

Association between ACEs and adult SLEs

Children who experienced more ACEs tended to go on to experience more SLEs as adults, β = 0.11, 95% CI = [0.04, 0.18], p = .002 (Fig. 1). This association remained after adjusting for childhood SES and IQ, β = 0.09, 95% CI = [0.02, 0.17], p = .013 (for associations between each of the potential risk factors and adult SLEs, see Table S2 in the Supplemental Material). The magnitude of the association did not change after adding low SES as an ACE (see Appendix 1 in the Supplemental Material). Moreover, this association generalized across nearly every type of adult SLE (see Table S3 in the Supplemental Material).

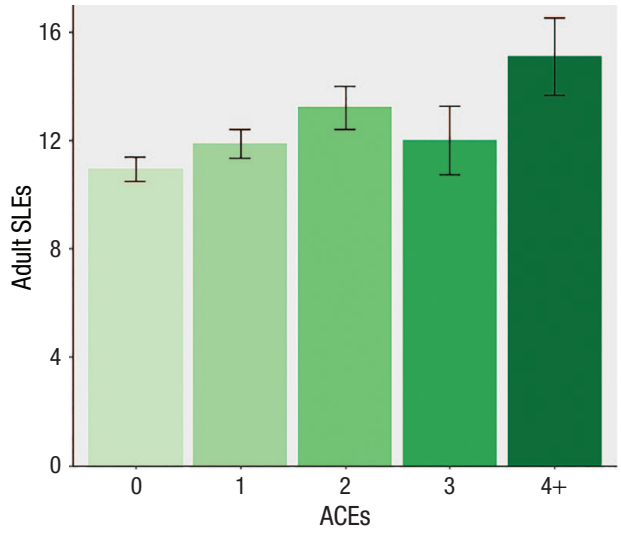

Fig. 1. Participants who had more adverse childhood experiences (ACEs; *x*-axis) tended to experience more stressful life events (SLEs) in adulthood (*y*-axis). Error bars represent ±1 *SE*.

Mediation of association between ACEs and adult SLEs by personality traits

Does each personality trait individually mediate the association between ACEs and adult SLEs? Young adults who had experienced more ACEs had significantly higher negative emotionality, β = 0.21, 95% CI = [0.15, 0.28], $p < .001$, and lower constraint, β = –0.12, 95% CI = [–0.18, –0.05], $p < .001$, after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament (see Table S4 in the Supplemental Material). In turn, higher negative emotionality, β = 0.29, 95% CI = [0.22, 0.36], $p < .001$, and lower constraint, β = –0.14, 95% CI = [–0.21, –0.06], $p < .001$, were each associated with more SLEs later in adulthood after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament (for full results for all three superfactors, see Table S4 in the Supplemental Material).

In the mediation models examining each personality trait individually (and adjusting for other background risk factors), there was a significant indirect effect of ACEs on adult SLEs via negative emotionality, β = 0.06, 95% CI = [0.04, 0.09], $p < .001$, and via constraint, β = 0.02, 95% CI = [0.01, 0.03], $p = .012$, after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament. In these models, the association between ACEs and adult SLEs was reduced to nonsignificance when accounting for negative emotionality, β = 0.03, 95% CI = [–0.04, 0.10], $p = .433$, but not constraint, β = 0.07, 95% CI = [0.003, 0.15], $p = .046$, suggesting that negative emotionality (but not constraint) fully mediated the association between ACEs and adult SLEs.

Does any personality trait provide unique information when all three factors are modeled simultaneously? In the model examining the three personality traits (i.e., negative emotionality, constraint, positive emotionality) as simultaneous (parallel) mediators, only negative emotionality emerged as a significant mediator of the association between ACEs and adult SLEs (indirect effect: β = 0.06, 95% CI = [0.04, 0.09], $p < .001$; Fig. 2). In other words, after adjusting for the other personality traits, children who experienced more ACEs had higher levels of negative emotionality as young adults, which, in turn, predicted more SLEs by midlife. Results were the same with and without adjustment for childhood SES, childhood IQ, and age-3 temperament.

Role of negative emotionality subfacets in the association between ACEs and adult SLEs

Does each subfacet of negative emotionality individually mediate the association between ACEs and adult SLEs? Children who experienced more ACEs had significantly higher levels of alienation, β = 0.17, 95% CI = [0.10, 0.24], $p < .001$; aggression, β = 0.14, 95% CI = [0.08, 0.21], $p < .001$; and stress reaction, β = 0.16, 95% CI = [0.09, 0.23], $p < .001$, as young adults after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament (see Table S5 in the Supplemental Material). In turn, higher levels of alienation, β = 0.32, 95% CI = [0.23, 0.40], $p < .001$; aggression, β = 0.17, 95% CI = [0.08, 0.25], $p < .001$; and stress reaction, β = 0.20, 95% CI = [0.13, 0.27], $p < .001$, were each associated with more SLEs later in adulthood after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament (see Table S5 in the Supplemental Material).

In the mediation models examining each subfacet of negative emotionality individually, there were indirect effects of ACEs on adult SLEs via each of the three negative-emotionality subfacets (indirect effect of alienation: β = 0.06, 95% CI = [0.03, 0.09], $p < .001$; indirect effect of aggression: β = 0.02, 95% CI = [0.01, 0.04], $p = .006$; indirect effect of stress reaction: β = 0.03, 95% CI = [0.02, 0.05], $p < .001$) after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament. In these models, the association between ACEs and adult SLEs was reduced to nonsignificance when accounting for alienation, β = 0.04, 95% CI = [–0.03, 0.11], $p = .327$; aggression, β = 0.07, 95% CI = [–0.01, 0.14], $p = .079$; and stress reaction, β = 0.06, 95% CI = [–0.01, 0.13], $p = .110$, suggesting that when examined individually, each negative-emotionality subfacet fully mediated the association between ACEs and adult SLEs.

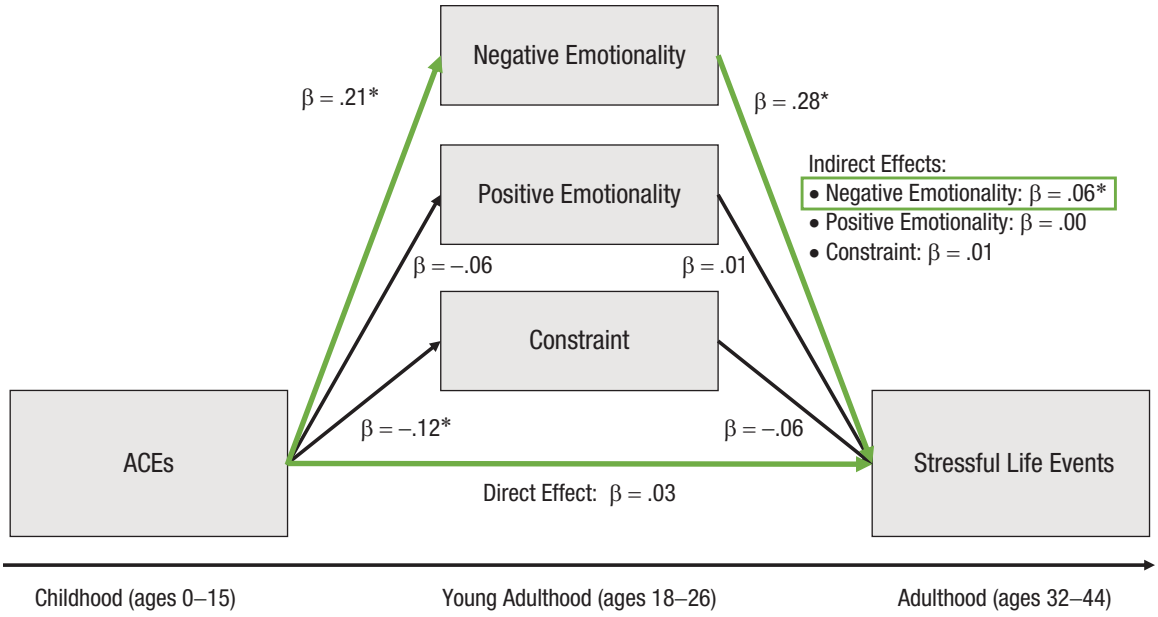

Fig. 2. In the parallel mediation model, only negative emotionality was a significant mediator of the association between adverse childhood experiences (ACEs) and adult stressful life events. Model adjusting for sex, childhood socioeconomic status, childhood IQ, and age-3 temperament. *$p < .05$.

Does any subfacet of negative emotionality provide unique information when all three subfacets are modeled simultaneously? In the model examining the three subfacets of negative emotionality as simultaneous (parallel) mediators (see Fig. 3), alienation emerged as a significant mediator of the association between ACEs and adult SLEs (indirect effect: β = 0.05, 95% CI = [0.02, 0.08], $p = .001$) after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament. The indirect effect of ACEs on adult SLEs via stress reaction was significant before adjusting for childhood SES, childhood IQ, and age-3 temperament; however, it was not robust after accounting for these other early life risk factors (see Table S5 in the Supplemental Material). Taken together, out of the three subfacets of negative emotionality, alienation appeared to be the single unique, robust mediator of the association between ACEs and adult SLEs. In other words, after taking into account other background risk factors, children who experienced more ACEs had higher levels of alienation as young adults, which, in turn, predicted more SLEs by midlife.

Replication of findings using informant-reported personality traits

Do informant-reported young-adult personality traits individually mediate the association between ACEs and adult SLEs? To ascertain whether informant-reported personality traits mediated the association between ACEs and adult SLEs in a fashion similar to that observed for self-reported personality traits, we tested the indirect effects of ACEs on adult SLEs via neuroticism (which captures aspects of MPQ-BF negative emotionality), agreeableness (which also captures aspects of MPQ-BF negative emotionality), and conscientiousness (which captures aspects of MPQ-BF constraint) as rated by informants when participants were 26 years old (Church, 1994). Young adults who had experienced more ACEs had significantly higher levels of neuroticism, β = 0.15, 95% CI = [0.08, 0.22], $p < .001$, and lower levels of agreeableness, β = –0.14, 95% CI = [–0.21, –0.07], $p < .001$, and conscientiousness, β = –0.11, 95% CI = [–0.18, –0.04], $p = .002$, after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament (see Table S6 in the Supplemental Material). In turn, higher levels of neuroticism, β = 0.17, 95% CI = [0.10, 0.24], $p < .001$, and lower levels of agreeableness, β = –0.09, 95% CI = [–0.16, –0.02], $p = .014$, and conscientiousness, β = –0.09, 95% CI = [–0.17, –0.03], $p = .008$, were each associated with more SLEs later in adulthood after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament (Table S6 in the Supplemental Material).

In the mediation models examining each informant-reported personality trait individually, there were indirect effects of ACEs on adult SLEs via neuroticism (indirect effect: β = 0.03, 95% CI = [0.01, 0.04], $p = .003$) and agreeableness (indirect effect: β = 0.01, 95% CI = [0.002, 0.03], $p = .048$) after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament. The association between ACEs and adult SLEs was reduced to

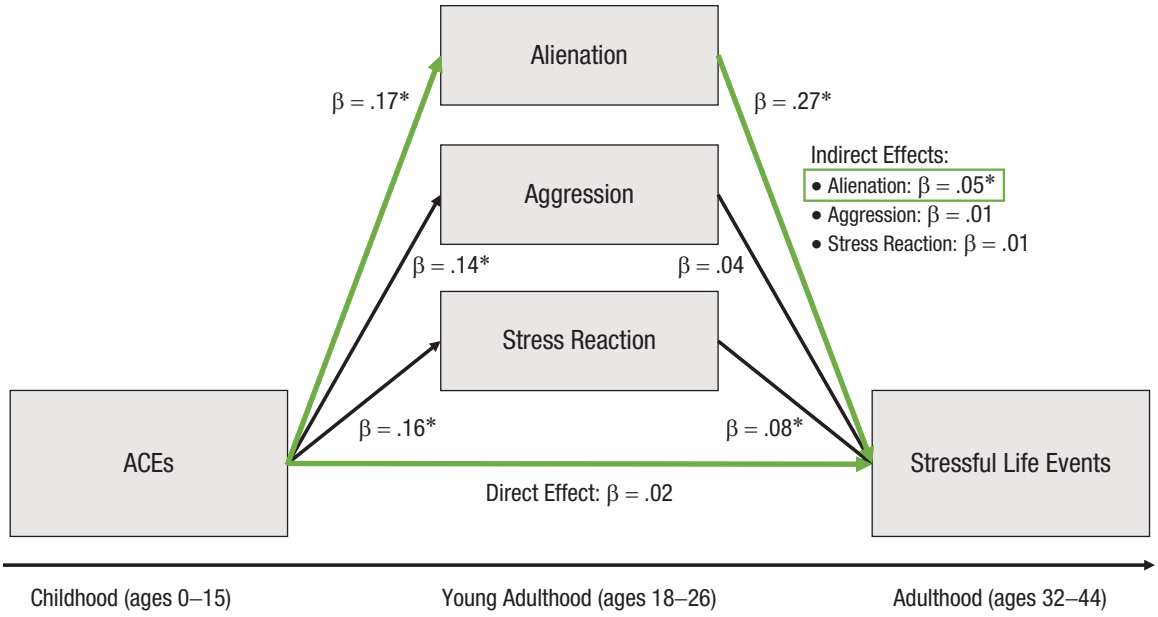

Fig. 3. In the parallel mediation model testing the three sub-facets of negative emotionality, only alienation was a significant and robust mediator of the association between adverse childhood experiences (ACEs) and adult stressful life events. Model adjusting for sex, childhood socioeconomic status, childhood IQ, and age-3 temperament. *$p < .05$.

nonsignificance when accounting for neuroticism, β = 0.07, 95% CI = [–0.01, 0.14], $p = .080$, but not agreeableness, β = 0.08, 95% CI = [0.01, 0.15], $p = .036$, suggesting that informant-reported neuroticism (but not agreeableness) fully mediated the association between ACEs and adult SLEs.

Does any informant-reported personality trait provide unique information when all three traits are modeled simultaneously? In the model examining the three informant-reported personality traits (i.e., neuroticism, agreeableness, conscientiousness) as simultaneous (parallel) mediators, only neuroticism emerged as a significant mediator of the association between ACEs and adult SLEs, β = 0.02, 95% CI = [0.01, 0.04], $p = .005$, after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament (see Fig. S2 in the Supplemental Material). In other words, after accounting for the other personality traits and background risk factors, children who experienced more ACEs had higher levels of informant-reported neuroticism as young adults, which, in turn, predicted more SLEs by midlife. These results paralleled the results found for self-reported negative emotionality.

Testing differential associations for distinct dimensions of ACEs: threat versus deprivation

Childhood adversity involving threat (i.e., physical abuse, emotional abuse, sexual abuse, exposure to domestic violence) was not significantly associated with adult SLEs, β = 0.05, 95% CI = [–0.02, 0.12], $p = .170$. However, children who experienced more deprivation ACEs (i.e., parental loss, emotional neglect, physical neglect) went on to experience more SLEs as adults, β = 0.11, 95% CI = [0.04, 0.18], $p = .001$.[1] This association remained after adjusting for childhood SES and childhood IQ, β = 0.10, 95% CI = [0.03, 0.17], $p = .006$, and even after adding threat ACEs to this multivariable model, β = 0.09, 95% CI = [0.02, 0.16], $p = .009$.

We then tested whether personality mediated the association between deprivation ACEs and adult SLEs. Results of mediation analyses were virtually identical to those observed using the total ACEs score; only negative emotionality uniquely mediated the association between deprivation ACEs and adult SLEs, β = 0.04, 95% CI = [0.02, 0.07], $p < .001$ (Fig. 4; Table S7 in the Supplemental Material), after adjusting for sex, childhood SES, childhood IQ, and age-3 temperament. In addition, among the subfacets of negative emotionality, only alienation uniquely mediated the association between deprivation ACEs and adult SLEs, β = 0.04, 95% CI = [0.02, 0.07], $p = .003$ (Table S8 in the Supplemental Material). Results were replicated using informant-reported personality traits as mediators (indirect effect of informant-reported neuroticism in parallel mediation model including neuroticism, conscientiousness, and agreeableness: β = 0.02, 95% CI = [0.01, 0.03], $p = .011$; Table S9 in the Supplemental Material).

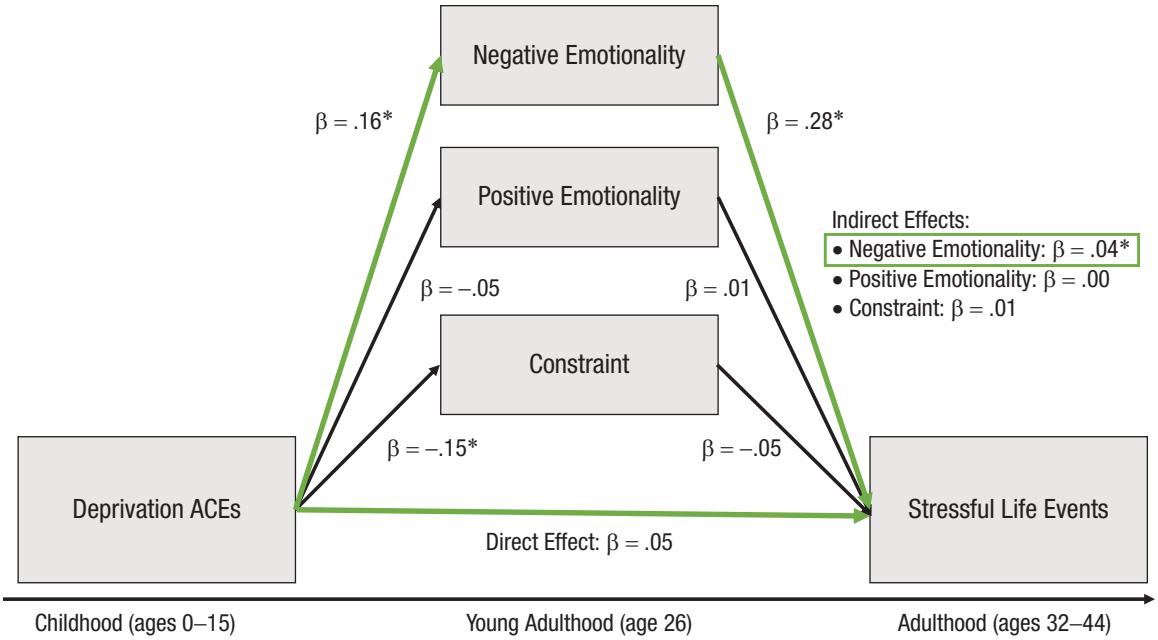

Fig. 4. Deprivation (but not threat) adverse childhood experiences (ACEs) were associated with adult stressful life events, and only negative emotionality was a robust and unique mediator of the association between deprivation ACEs and adult stressful life events. Mediation model using deprivation ACEs, adjusting for sex, childhood socioeconomic status, childhood IQ, and age-3 temperament. *$p < .05$.

Discussion

Findings from this longitudinal cohort study provide evidence that individuals who experienced more adversity in childhood tended to go on to experience more adversity in adulthood as well. This continuity of adversity across the life course seemed to be accounted for, at least in part, by personality during young adulthood. More specifically, after accounting for other factors that could explain the continuity of adversity, including sex, more deprived socioeconomic origins, and lower childhood IQ, negative emotionality emerged as a robust and unique mediator: Individuals who had more ACEs grew into young adults who had personalities characterized by higher negative emotionality, which, in turn, made them more likely to experience further SLEs in adulthood. Zooming in on the facets that comprise negative emotionality revealed that alienation—a tendency to feel mistreated and to expect the worst from others—appeared to be driving this effect.

Note that the association between early life adversity and later life adversity was not explained by other factors known to increase risk for SLEs (i.e., more deprived socioeconomic origins, lower childhood IQ; Breslau et al., 2006; Lantz et al., 2005). Univariable models showed that the effect size for the association of early life adversity with adult SLEs was similar to those for other established risk factors (i.e., more deprived socioeconomic origins and lower childhood IQ); however, in the multivariable model, the effects of socioeconomic origins and IQ were no longer significant, whereas early life adversity remained a robust predictor of adult SLEs. Furthermore, mediation of the association between early life adversity and adult SLEs by negative emotionality (and its subfacet alienation) was not explained by preexisting differences in temperament. Even greater confidence in the robustness of the present results comes from the conceptual replication of findings using informant-reported personality, which showed that neuroticism, the Big Five counterpart to MPQ negative emotionality, mediated the association between ACEs and adult SLEs.

Why is it that negative emotionality—and alienation specifically—emerged as the most robust mediator of the association between ACEs and adult SLEs? Previous research has implicated negative emotionality/neuroticism in the experience of adversity (Kendler et al., 2003), but typically in a piecemeal manner and without the methodological ability to test long-term prospective associations. Our mediation model integrates the threads of previous research by incorporating childhood adversity, young-adult personality, and adult SLEs into a single model and elucidating the interconnections among all of them. Moreover, by including other personality traits (i.e., constraint and positive emotionality) in our model, we were able to demonstrate that (a) negative emotionality helps explain the association between childhood adversity and adult SLEs above and

beyond the effects of constraint and positive emotionality, both of which show small to moderate degrees of overlap with negative emotionality (see Table S1 in the Supplemental Material), and (b) although low constraint mediated the association between childhood adversity and adult SLEs in a single-mediator model, this effect was reduced to nonsignificance in the parallel mediation model, suggesting that its mediating effect was accounted for by its overlap with negative emotionality. Thus, although the results generally supported our hypotheses, the subhypothesis that diminished constraint would mediate the association between early and later adversity received only partial support, whereas the subhypothesis that heightened negative emotionality would mediate this association was more strongly supported.

The fact that the mediating effect of negative emotionality appeared to be driven by the lower-order facet alienation is consistent with previous research and theory. Previous research has indicated that neuroticism, impulsivity, and low agreeableness (including, in particular, the facet of low trust) predicted later SLEs, which, in turn, predicted the development of health problems (Iacovino et al., 2016). Thus, the role of alienation, which may best be conceptualized as an interstitial construct that blends facets of Big Five neuroticism and (low) agreeableness, particularly those facets reflecting pessimism and mistrust (Church, 1994; Tellegen & Waller, 2008), may align with the previously highlighted roles of neuroticism and (low) agreeableness in the stress-generation process. Furthermore, theory suggests that children use their early experiences to form expectations about the social world, that is, whether others can be trusted and whether social relationships are enduring or disposable (Belsky, 2012). Children exposed to adversity may develop expectations that others who should care for them will not, bringing these beliefs that others cannot be trusted to their other relationships. These expectations and beliefs may strengthen and crystallize over the course of development into a component of personality by young adulthood. Heightened mistrust about the motives and intentions of others may then create a self-fulfilling prophecy in which mistrustful individuals behave in ways that harm relationships (e.g., expressing criticism, withdrawing) and evoke responses from others that confirm their original expectations, thereby prompting SLEs (e.g., dissolution of a romantic relationship, getting fired from a job; Roberts et al., 2007). In other words, alienation may entail a set of social-cognitive schemas (e.g., hostile attribution bias; Dodge, 2006) that help explain why individuals who experienced maltreatment as children behave in ways that increase the likelihood of future stressful experiences. Individuals with heightened alienation and mistrust may also self-select into contexts, situations, and relationships with higher potential for bringing about stressful experiences.

Participants who had more early experiences of deprivation—including physical neglect, emotional neglect, and parental loss—but not threat—including physical abuse, emotional abuse, sexual abuse, and witnessing domestic violence—grew into adults who had more stressful life experiences. Moreover, the effect size for the association between deprivation ACEs and adult SLEs was equivalent to the effect size for the association between cumulative (i.e., total) ACEs and adult SLEs. These patterns suggest that it is early experiences of deprivation, rather than threat, that set an individual up to experience further adversity in adulthood. From a theoretical perspective, the dimensional model of early adversity (McLaughlin & Sheridan, 2016) appears to provide more specific insight into the types of early experiences that relate to (and possibly promote) later life adversity. Moreover, paralleling the results for cumulative ACEs, deprivation ACEs were associated with later life adversity via negative emotionality (and specifically alienation). It may be that the lack of expected social and cognitive input that characterizes deprivation ACEs hinders the development of capacities needed to navigate adulthood and steer clear of stressful situations and experiences. These capacities may include secure attachment, emotion regulation, and executive function (e.g., problem solving and planning; Sheridan et al., 2017). In addition, compared with experiences of threat, experiences of deprivation may indicate a pattern of maltreatment that is more chronic and pervasive (although we cannot directly confirm this was the case in the present sample; Gauthier et al., 1996; McSherry, 2007). Along these lines, deprivation ACEs may be more indicative of the quality of children's family environment, the context in which they spend the most time and which has the strongest influence on their development. In contrast, it is possible for threat experiences to be one-time events (e.g., experiencing sexual abuse) that can occur outside of the family environment. Taken together, compared with threat ACEs, deprivation ACEs may be a more specific marker of risk for further adversity in adulthood and, by extension, poorer health outcomes overall. However, we caution that we could not establish that the association between deprivation ACEs and adult SLEs was significantly stronger than the association between threat ACEs and adult SLEs (and we did have equal power to detect associations for both dimensions). Replication studies, larger sample sizes, and meta-analyses will be necessary to test the speculations offered here about deprivation versus threat experiences.

This study has implications for research, theory, and clinical practice. In terms of research and theory, these findings add to the understanding of how early adversity affects vulnerability to future stress. The bulk of the research in this area has focused on stress sensitization (Hammen et al., 2000; Stroud, 2020), which is the phenomenon whereby children who experience adversity go on to become more sensitive to stressful events (i.e., more vulnerable to psychopathology in response to stress) later in life (McLaughlin et al., 2010). The present findings build on stress-sensitization research, which has demonstrated reactive person-environment interactions, by suggesting a role for active and evocative person-environment interactions as well in the continuity of adversity across the life course. In other words, these results demonstrate that aside from being more sensitive to later stressful events, adults who experienced adversity in childhood are more likely to experience later stressful events in the first place. Early adversity may therefore deliver a double hit by making individuals both more likely to experience later adversity and more sensitive to later adversity when it is encountered. In addition, although stress-sensitization research has tended to focus on biological mechanisms of sensitivity to stress (e.g., inflammation; Bourassa et al., 2021; Fagundes & Way, 2014), the present findings elucidate another level at which early adversity may heighten risk for psychopathology broadly—via negative emotionality, a strong marker of general risk for psychopathology (Brandes et al., 2019; Lahey et al., 2021).

In terms of clinical practice, the findings provide further impetus for developing and refining psychological interventions that explicitly target negative emotionality and the dysfunctional beliefs associated with alienation (Kazantzis et al., 2021; Sauer-Zavala et al., 2021). Our findings suggest that reducing negative emotionality and alienation may not only improve mental-health and psychosocial functioning, but it may also reduce young adults' vulnerability to experiencing future SLEs and disrupt the continuity of adversity. Indeed, targeting negative emotionality in treatment could be a more efficient way to achieve long-lasting increases in well-being than targeting symptoms of specific psychiatric disorders, which tend to morph over time (Caspi et al., 2020; Plana-Ripoll et al., 2019) and have less value in predicting future mental-health outcomes (Waszczuk et al., 2022). However, these ideas are speculative and require direct testing. Finally, although we have focused on negative emotionality as a modifiable risk factor, in part based on evidence that early adversity (particularly deprivation experiences such as neglect) can be difficult to prevent (Chaffin & Friedrich, 2004), our findings suggest that efforts to prevent and disrupt early adversity (CDC, 2022) are still worthwhile because these experiences are the starting point in the chaining of lifelong adversity and poor health outcomes.

This study has several limitations. First, the participants self-identified as predominantly White and originated only from New Zealand. It is unknown whether the present study's findings will replicate in other ethnic groups or geographic regions. Second, this study was observational and thus cannot establish whether observed associations are causal. Future studies are necessary to ascertain whether the observed associations (e.g., between negative emotionality in young adulthood and SLEs later in adulthood) are modifiable through prevention and treatment efforts. Third, although we conducted a conceptual replication of findings using informant-reported personality traits, the informant-reported personality measure (i.e., the Big Five) did not map exactly onto the scales of the self-reported personality measure (i.e., the MPQ); we were therefore unable to test whether the mediating effect of alienation was replicated using informant report. Fourth, because the early childhood temperament measure used in the present study was necessarily different from the young-adult personality measure, adjusting for early childhood temperament did not allow us to completely rule out any contributions of early emerging individual differences; however, given the need to balance similarity of the two measures, on the one hand, and developmental considerations, on the other hand, the temperament measure was the closest possible approximation to an early life personality measure. Fifth, although we did not directly measure health outcomes in the present study, previous studies using this same cohort have already indicated that adversity in both childhood and adulthood contribute to worse health outcomes at midlife (Bourassa, Caspi, et al., 2023; Bourassa, Moffitt, et al., 2023). Finally, the data for ACEs and adult SLEs were not fine-grained enough to make further delineations that might elucidate the impact of developmental timing and event type on the present findings. More specifically, developmental timing and chronicity of ACEs are likely to influence the extent to which ACEs affect development and later outcomes. Furthermore, categorizing adult SLEs as interpersonal versus noninterpersonal or independent versus dependent are two distinctions that appear to be relevant for understanding reciprocal effects between personality and adversity (Allen et al., 2022; Metts et al., 2021; Shiner et al., 2017). Future research should examine the role of these factors in influencing the associations among ACEs, young-adult personality, and adult SLEs. However, we note that the types of SLEs that were not predicted by ACEs (e.g., friend or family member

experiencing serious illness; Table S3 in the Supplemental Material) could be considered primarily independent in nature—in other words, it would be unlikely that the individual played a direct role in causing the event. This pattern is consistent with previous research, which suggests that independent SLEs are neither heritable (Plomin & Bergeman, 1991) nor predicted by individual characteristics (Allen et al., 2022; Conway et al., 2012). These limitations should be considered in light of the study's strengths, which include the prospective ascertainment of ACEs to reduce bias in estimating associations with self-reported personality traits, the decades-long time frame of investigation, and the incorporation of a conceptual replication of findings using informant-reported personality traits.

In conclusion, the findings of this cohort study provide direct, quantitative evidence for the continuity of adversity from childhood to midlife. They further suggest that individuals who are exposed to early adversity—specifically, experiences of deprivation—displayed higher negative emotionality and alienation in young adulthood, which helped to account for their tendency to experience further adversity later in adulthood. Interventions that aim to reduce negative emotionality and alienation in young adulthood could reduce vulnerability to experiencing further adversity, thereby disrupting the continuity of adversity across the life course and promoting health and well-being among aging adults.

Transparency

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Author Contributions

Grace M. Brennan: Conceptualization; Formal analysis; Funding acquisition; Methodology; Software; Validation; Visualization; Writing – original draft.

Terrie E. Moffitt: Conceptualization; Data curation; Funding acquisition; Investigation; Methodology; Project administration; Resources; Supervision; Writing – review & editing.

Kyle J. Bourassa: Methodology; Writing – review & editing.

HonaLee Harrington: Data curation; Software; Writing – review & editing.

Sean Hogan: Investigation; Writing – review & editing.

Renate M. Houts: Formal analysis; Software; Validation; Writing – review & editing.

Richie Poulton: Funding acquisition; Investigation; Methodology; Project administration; Resources; Supervision; Writing – review & editing.

Sandhya Ramrakha: Funding acquisition; Investigation; Methodology; Project administration; Resources; Supervision; Writing – review & editing.

Avshalom Caspi: Conceptualization; Data curation; Funding acquisition; Investigation; Methodology; Project administration; Resources; Supervision; Writing – review & editing.

Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

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ORCID iDs

Grace M. Brennan https://orcid.org/0000-0003-0246-0820
Kyle J. Bourassa https://orcid.org/0000-0001-9372-2309
Avshalom Caspi https://orcid.org/0000-0003-0082-4600

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Supplemental Material

Additional supporting information can be found at http://journals.sagepub.com/doi/suppl/10.1177/21677026231220337

Note

1. Note that a Wald test of parameter constraints was unable to establish that the regression coefficient for deprivation ACEs was significantly different from the regression coefficient for threat ACEs, $p = .077$.

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