Emotion

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Emotional Reactivity to Daily Positive and Negative Events in Adulthood: The Role of Adverse Childhood Experiences

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Adverse childhood experiences (ACEs) have lasting impact on everyday emotional experiences in adulthood, with extant evidence linking ACEs to elevated emotional reactivity. However, findings are typically based on reactivity to *negative* daily events (i.e., stressors) and its moderation by *cumulative* ACEs (where individual adversities are summed into a total score), which overlooks adversity-specific associations and reactivity to other types of daily events. We therefore examine cumulative and individual ACEs as moderators of emotional reactivity to positive and negative daily events. Data were drawn from the National Study of Daily Experiences 2 (NSDE-II), collected 2004–2009, whereupon middle-aged and older adults ($N = 1{,}994$; $M_{age} = 58.61$; range = 35–86; 57% female) reported daily events and affect on eight consecutive evenings. Multilevel models were used to estimate the moderating role of ACEs for within-person associations between positive/negative events and affect. We found that cumulative ACEs and a number of individual adversities (specifically those characterized by abuse but not by neglect or household challenge/dysfunction) were associated with emotional reactivity to positive *and* negative daily events. That is, cumulative and abuse-based ACEs were associated with increased negative affect and/or decreased positive affect on days with a negative event *and on days with a positive event*. Our findings add to literature on the long-lasting and pervasive influence of early life experiences on everyday emotional experiences in adulthood. We discuss differences in reactivity to positive versus negative daily events and in cumulative versus adversity-specific associations as well as their theoretical and methodological implications.

Keywords: emotional/affective reactivity, positive events, experience-sampling method, adverse childhood experiences

Supplemental materials: https://doi.org/10.1037/emo0001512.supp

Our emotional development is profoundly shaped by our early life experiences (Dunn et al., 2018; Riediger & Bellingtier, 2022). Adverse childhood experiences (ACEs), including potentially traumatic events such as abuse, neglect, and exposure to household challenge or dysfunction, in particular are known to have a lasting influence on day-to-day emotional processing and regulation (e.g., Dunn et al., 2018; Infurna et al., 2015; Riediger & Bellingtier, 2022). Indeed, there is growing evidence of elevated emotional reactivity (above-average increases in negative affect) to the minor hassles and challenges of daily life among adults with a history of ACEs within the general population (e.g., Glaser et al., 2006; Kong, Martire, et al., 2021; Poon & Knight, 2012). This is important because elevated reactivity is a well-established transdiagnostic mechanism linking ACEs to the development of emotional disorders across adulthood and old age (for a review, see Hoppen & Chalder, 2018). Moreover, over 30% of adults in the general population in the Western world have experienced childhood adversity (World Health Organization, Sethi et al., 2018); yet, few studies examine these associations in nonclinical populations. Elucidating associations among ACEs and emotional reactivity in the general population is therefore critically important in the face of long-term individual and societal impacts arising from child adversity (see Fang et al., 2012). However, the widespread focus on *cumulative* ACEs overlooks the unique attributes of individual adversities and obscures the

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possibility of adversity-specific associations arising (see Evans et al., 2013; McLaughlin & Sheridan, 2016). Moreover, the focus on reactivity to *negative* daily events overlooks other salient experiences in the daily lives of adults and older adults, namely, positive or joyful experiences (see Infurna et al., 2015). Indeed, conceptual accounts of differential susceptibility (Belsky & Pluess, 2009; Pluess & Belsky, 2013) imply that ACEs not only result in increased sensitivity to the hassles and challenges of daily life but also make people disproportionately more likely to benefit from the positive or enriching experiences of daily life, such as pleasing social interactions or work events (i.e., by displaying above-average increases in positive affect and/or decreases in negative affect). This study therefore aims to substantiate and extend existing evidence of the links between ACEs and emotional reactivity in adulthood by comprehensively examining individual and cumulative ACEs as moderators of reactivity to positive and negative daily events among adults and older adults.

Emotional Reactivity in Adulthood and Old Age: Positive and Negative Daily Events

Research on emotional reactivity to negative events focuses on the ways in which people (emotionally) respond to daily stressors or other types of negative events, typically referred to as the minor hassles or challenges of daily life that have the potential to disrupt routines or cause irritation (Almeida et al., 2020). Unsurprisingly, a vast body of evidence indicates that individuals report higher negative affect (NA) and lower positive affect (PA) on days with these negative events compared to days without (e.g., Hay & Diehl, 2010; Koffer et al., 2019). At the same time, there is growing evidence of emotional reactivity to *positive* events, where individuals tend to report higher PA and lower NA on days with positive events, such as pleasant social interactions and spiritual activities, compared to days without (Fredrickson et al., 2008; Srivastava et al., 2008).

These types of emotional reactivity are considered trait-like and have the potential to influence a wide range of physical, psychological, and socioemotional outcomes. For example, high, low, or no emotional reactivity to negative events (e.g., strong within-person association of daily stress and affect) is thought to be maladaptive when frequent and repeated (Koffer et al., 2019), with evidence that its accumulation can lead to physical and mental health problems across the lifespan (Charles et al., 2013; Chiang et al., 2018; Piazza et al., 2013; Rush et al., 2024). On the other hand, conceptual accounts from the realm of positive psychology, such as the broaden-and-build theory (Fredrickson, 2001) and the savoring hypothesis (Bryant & Veroff, 2007), indicate that emotional reactivity to positive events has the potential to be adaptive, with evidence that its accumulation can lead to positive outcomes, such as better overall mental health and higher levels of trait report affective well-being and life satisfaction (Catalino & Fredrickson, 2011; Fredrickson & Joiner, 2002; Grosse Rueschkamp et al., 2020). Critically, there is evidence that emotional reactivity to positive events is compromised in adults with disrupted emotional development in early life (e.g., Bylsma et al., 2008). Given that elevated reactivity to negative events is a well-established risk factor linking ACEs to a range of maladaptive outcomes (e.g., Hoppen & Chalder, 2018), it is crucial to understand whether, and in what direction, ACEs are associated with these types of emotional reactivity.

Emotional Reactivity in Adulthood and Old Age: The Role of Adverse Childhood Experiences

It is widely accepted that our emotional development is profoundly shaped by our early life experiences (Dunn et al., 2018; Riediger & Bellingtier, 2022), with growing evidence linking early adversity to the (dys)regulation of everyday emotional experiences in adulthood (e.g., Glaser et al., 2006; Infurna et al., 2015; Kong, Liu, et al., 2021; Kong, Martire, et al., 2021; Poon & Knight, 2012). Childhood adversities comprise distinct but highly interrelated experiences (for a conceptual overview, see Evans et al., 2013), making them difficult to operationalize in a way that adequately captures these nuances. Hence, while there is not one clear or consistent way in which ACEs are operationalized (for a full discussion, see McLaughlin & Sheridan, 2016), researchers often use an approach that either reflects the interrelation of adversities (the cumulative-risk approach) or ones that reflect the distinctness of individual adversities (the adversity-type approach). Importantly, the theorized pathways linking ACEs to adult emotional reactivity differ between these approaches.

The Cumulative Risk Approach

Cumulative ACEs are primarily thought to undermine emotional development and impact adult emotional reactivity via the accumulation of frequently co-occurring adversities (Felitti et al., 1998; Ports et al., 2020). In line with the daily stress and allostatic load literature (e.g., Almeida et al., 2009), this is thought to prompt physiological *wear-and-tear* via the *stress dysregulation pathway* resulting in greater cumulative impact on emotional development than singular exposure (Bronfenbrenner & Evans, 2000; McEwen, 1998, 2003; for an overview, see Evans et al., 2013). Indeed, there is evidence that experiencing more co-occurring ACEs is linked to increased subjective perceptions of stress and a lowered threshold for responding to minor hassles and challenges in daily life (Karlamangla et al., 2019; for a review, see Koss & Gunnar, 2018). In addition to stress dysregulation, neurobiological perspectives hold that experiencing multiple co-occurring ACEs leads to elevated emotional reactivity in adulthood because they are typically characterized by decreased exposure to language, linguistic complexity, and scaffolded learning environments (Sheridan et al., 2020), which alter the structure, function, and connectivity of brain regions involved in emotional regulation (for a review, see Teicher & Samson, 2013). This can result in poor inhibitory control, reduced cognitive flexibility, impaired working memory, and heightened sensitivity to emotional stimuli, all of which have been associated with higher levels of emotional reactivity to negative events (i.e., above-average increases in NA; Eisenberg et al., 2010). Perspectives from constructed emotions theory (Barrett, 2017a, 2017b) also imply that because multiple co-occurring adversities are characterized by prolonged exposure to negative experiences in early life, this may bias *interoception* (toward hypervigilance and heightened responsiveness), *core affect* (toward negative valence and higher arousal), and *categorization* (by generating a more extensive and easily accessible repertoire of negative emotion concepts), potentially resulting in higher levels of emotional reactivity to negative events. Consistent with these theoretical accounts is growing evidence that cumulative ACEs are associated with above-average increases in NA and/or decreases in PA on days with a negative event (Kong, Liu, et al., 2021; Poon & Knight, 2012).

Although cumulative risk has rarely been considered in the context of emotional reactivity to positive events (for a commentary, see Zautra et al., 2005), notions of differential susceptibility (i.e., individual differences in responses to both positive and negative contexts: Belsky & Pluess, 2009; Pluess & Belsky, 2013) imply that adults with more cumulative ACEs might display disproportionately positive reactions to supportive or enriching environments (see Infurna et al., 2015). On the contrary, constructed emotion theory implies that everyday positive events may not elicit strong positive emotions because the individual's predictive model may not readily incorporate positive experiences (Barrett, 2017a, 2017b). Indeed, positive events might be met with skepticism or anxiety, complicating the emotional response. Nonetheless, initial findings from Infurna et al. (2015) provide a more positive picture, with evidence that cumulative ACEs are indeed associated with emotional reactivity to positive events (i.e., above-average increases in PA and/or decreases in NA), a finding consistent with differential susceptibility. Critically, however, the cumulative risk score used by Infurna et al. (2015) only included adversities associated with childhood abuse, overlooking other important ACEs such as neglect and household dysfunction or challenge. This underscores the importance of substantiating initial evidence of emotional reactivity to positive events with more comprehensive measures of ACEs. Moreover, it is unclear whether, and to what extent, specific types of adversities included in these various cumulative risk scores contribute to such reactivity.

The Adversity Type Approach

When examining individual adversities, researchers often organize them into groups based on their shared features. For example, the dimensional model of adversity and psychopathology (McLaughlin & Sheridan, 2016) groups ACEs into threat versus deprivation, where the former is characterized by the presence of harm (e.g., emotional, physical, sexual abuse) and the latter by the absence of cognitive and social input (e.g., physical, emotional neglect). The ACEs framework—a commonly used and influential measurement tool developed by the Centers for Disease Control and Prevention (CDC)—similarly groups adversities into threat versus deprivation but with the additional category of household dysfunction/challenge to reflect a broader range of potentially traumatic experiences (e.g., parental substance abuse, housing instability; Ports et al., 2020).

It is plausible that these different groups of adversities contribute more, less, or not at all to the pathways linking cumulative ACEs to emotional reactivity. For example, childhood adversities characterized by prolonged stress exposure, such as threat-based adversities (e.g., physical/sexual/emotional abuse) and/or stressful household challenges (e.g., financial distress, frequently moving home), are potentially more likely to impact emotional development via the *stress dysregulation pathway* than adversities related to deprivation (e.g., emotional neglect). Indeed, although there is evidence that cumulative ACEs are linked to increased subjective perceptions of stress in adulthood (e.g., Karlamangla et al., 2019), these effects seem to only arise for cumulative measures based on adversities characterized by stress (e.g., Betz et al., 2021; LoPilato et al., 2020). Moreover, theories related to emotional-learning processes maintain that exposure to threat-based (but not deprivation-based) adversities sensitizes cognitive and emotional processes involved in fear learning, which has been linked to a heightened sensitivity to the hassles and challenges of daily life (see McLaughlin & Sheridan, 2016). Furthermore, there is evidence that these fear learning processes can result in poor discrimination between safety and threat, potentially leading to exacerbated negative emotional reactions to neutral stimuli perceived as threatening (McLaughlin & Sheridan, 2016). Taken together, these lines of research indicate that adversities related to threat (e.g., physical/sexual/emotional abuse) and those related to stressful household challenges (e.g., financial distress, frequently moving home) might be independently associated with higher levels of emotional reactivity to negative events (i.e., above-average increases in NA and/or decreases in PA).

Childhood adversities related to deprivation are more closely associated with attachment disruption and blunted displays of emotion making them potentially more likely to be associated with dampened emotional responses to negative events (i.e., below-average increases in NA and/or decreases in PA) and to positive events (i.e., below-average decreases in NA and/or increases in PA). To illustrate, adversities related to deprivation (e.g., emotional neglect by a caregiver) and/or to parental challenges (e.g., parental substance abuse, parental divorce) are often characterized by inconsistent emotional learning environments (e.g., Kelley et al., 2015) that reduce opportunity to establish secure attachments necessary for the development of internal working models that underpin emotional development and later guide emotional reactions in everyday life (Mikulincer & Shaver, 2010; Woodward et al., 2000). Although this could lead to amplified emotional displays (e.g., Calkins & Hill, 2007), unstimulating childhood environments, fewer scaffolded learning environments, and less positive caregiver–child interactions are associated with inhibited emotional expressions, including blunted or infrequent emotional displays and lack of emotional clarity and discrimination (e.g., Berzenski, 2019; Eilert & Buchheim, 2023).

Although a number of studies have examined the moderating role of individual ACEs for emotional reactivity in adulthood (e.g., Cristóbal-Narváez et al., 2016; Glaser et al., 2006; Kong, Martire, et al., 2021; Poon & Knight, 2012), these have focused exclusively on reactivity to negative events. Moreover, when examining the moderating role of individual ACEs, most of these studies did not statistically account for their conceptual (and empirical) overlap with other interrelated ACEs, which can obfuscate their independent or unique effects (Evans et al., 2013) and make it hard to draw conclusions on whether and in what direction differential associations arise. This underscores the importance of examining the moderating role of individual ACEs for emotional reactivity to positive and negative events with a comprehensive statistical approach that accounts for interrelated ACEs.

The Present Study

This study examined the moderating role of individual and cumulative ACEs for emotional reactivity to positive *and* negative daily events among middle-aged and older adults. Because a central aim of the study was to build upon, substantiate, and extend existing evidence, we implemented two approaches frequently used in developmental and early trauma research: cumulative risk and adversity type. To do so, we used cumulative and adversity-specific operationalizations of ACEs developed by Danielson and Sanders (2018) with existing items from Waves 1 and 2 of the Midlife in the United States (MIDUS) studies to replicate the original CDC framework (see

Felitti et al., 1998; Ports et al., 2020). This framework includes a broad range of childhood adversities, including those related to household dysfunction/challenge often overlooked by other prominent measurement tools (e.g., Childhood Trauma Questionnaire: Bernstein et al., 2003). Previous studies have used the MIDUS datasets to examine links between early adversity and adult emotional reactivity (Kong, Liu, et al., 2021; Kong, Martire, et al., 2021; Poon & Knight, 2012) or adult daily stress (Mosley-Johnson et al., 2021). However, the present study considerably extends this research by implementing cumulative *and* adversity-specific measures of ACEs and by examining emotional reactivity to *positive* as well as negative daily events, thereby providing a more rigorous, differential, and nuanced examination.

Based on conceptual accounts and empirical evidence of stress dysregulation (McEwen, 1998, 2003) and differential susceptibility (Belsky & Pluess, 2009; Infurna et al., 2015), it was expected that cumulative ACEs would be associated with above-average emotional responses to negative events (i.e., above-average increases in NA and/or decreases in PA) and to positive events (i.e., above-average increases in PA and/or decreases in NA). In terms of adversity-specific associations: methodological and conceptual limitations make it hard to hypothesize whether and in what direction individual associations will arise. Because of this, it was *tentatively* expected that different types of adversities would evince unique associations with adult emotional reactivity. Specifically, it was expected that adversities characterized by stress, including threat-based adversities (e.g., physical, emotional, sexual abuse) and stressful household challenges (e.g., financial distress, frequently moving home) would be independently associated with above-average emotional responses to negative events (i.e., above-average increases in NA and/or decreases in PA). It was also tentatively expected that adversities characterized by possible attachment disruption, including deprivation-based adversities (e.g., emotional neglect by a caregiver) and those related to parent-focused household challenge or dysfunction (e.g., parental substance abuse; parental divorce) would each be independently associated with dampened emotional responses to negative events (i.e., below-average increases in NA and/or decreases in PA) and to positive events (i.e., below-average decreases in NA and/or increases in PA).

Method

We used daily data from the second wave of the National Study of Daily Experiences (NSDE), a daily diary study part of the publicly available MIDUS studies. Following Danielson and Sanders (2018), a cumulative-risk measure was constructed with individual items related to eight distinct ACE categories from either MIDUS-I or MIDUS-II (see the Measures section for more details). This created a retrospective ACE measure.

Participants and Procedure

A sample of 2,022 participants from NSDE-II (M_{age} = 58.61, SD = 12.12, age range = 35–86; 57% female) completed short telephone interviews about their daily experiences of positive and negative events, along with PA and NA, across eight consecutive evenings (for full data collection details, see Almeida et al., 2009). Respondents provided on average seven of eight daily interview (SD = 0.31), resulting in a total of 14,912 daily observations (92% completion rate). All participants from NSDE-II had previously taken part in the larger MIDUS-I (1995–1996) and MIDUS-II (2004–2006) projects, whereupon they provided retrospective ratings of various ACEs. Participants who provided information on at least one ACE were included in analyses, with 28 participants excluded from analyses due to missing data, leaving a final sample of 1,994. See Table 1 for demographic and descriptive information.

As this study used preexisting data, it was not possible to conduct a priori power analyses. Nonetheless, estimates from the G*Power software confirmed that a sample of 1,994 was sufficient to detect

Table 1
Descriptive Statistics and Intercorrelations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Age	—																		
2. Female	–.02	—																	
3. Education	–.08	–.11	—																
4. Race (White)	–.02	.00	.06	—															
5. Health self-report	–.09	–.06	.22	.10	—														
6. Chronic conditions	.13	.17	–.12	–.09	–.39	—													
7. ACE cumulative	–.12	.09	–.13	–.07	–.10	.17	—												
8. Parental divorce	–.06	.07	–.13	.03	–.07	.12	.52	—											
9. Substance abuse	–.08	.04	–.09	–.09	–.02	.08	.53	.17	—										
10. Sexual abuse	–.13	.19	–.03	–.12	–.06	.12	.36	.13	.10	—									
11. Physical abuse	–.07	.03	–.05	–.10	–.06	.10	.55	.12	.17	.12	—								
12. Emotional abuse	–.12	.05	–.05	–.08	–.06	.10	.63	.14	.23	.18	.64	—							
13. Emotional neglect	–.04	.13	–.09	–.09	–.07	.11	.53	.20	.16	.16	.31	.37	—						
14. Move frequently	.02	.00	–.04	–.02	–.08	.11	.47	.20	.08	.03	.09	.11	.07	—					
15. Finance distress	.01	–.02	–.06	.05	–.05	.06	.51	.17	.16	.08	.15	.18	.16	.13	—				
16. Positive affect	.17	.00	–.06	.15	.14	–.15	–.13	–.05	–.09	–.11	–.06	–.09	–.09	–.04	–.03	—			
17. Negative affect	–.11	.05	.01	–.08	–.11	.17	.09	.04	.05	.11	.04	.09	.07	.03	.03	–.49	—		
18. Negative event	–.13	.05	.11	–.03	.01	.06	.06	.02	.02	.09	.04	.06	.04	.02	.01	–.21	.35	—	
19. Positive event	.05	.04	.12	.03	.06	–.01	.00	–.01	.01	.02	.00	.01	.01	.00	.01	.09	.00	.12	—
M (or %)	58.61	57%	7.19	93.5%	3.72	2.29	1.24	0.24	0.23	0.14	0.12	0.13	0.10	0.34	0.23	2.7	0.2	0.4	0.7
SD	12.12		2.38		0.89	2.28	1.40	0.41	0.40	0.30	0.20	0.31	0.29	0.35	0.36	0.75	0.4	0.5	0.5

Note. Intercorrelations of $r \geq .08$ differ statistically significantly from 0 at $p = .01$. ACE = adverse childhood experience.

within-person daily event—affect associations and their (independent) moderation by cumulative and individual ACEs (statistical power of 0.80–0.98 to detect medium effect sizes with an α of .05). Data collection for the MIDUS studies was approved by the institutional review board of the Pennsylvania State University.

Measures

Adverse Childhood Experiences

Retrospective reports of early adversity were drawn from MIDUS-I and MIDUS-II. Danielson and Sanders (2018) created a composite score reflective of the original ACEs measurement tool (CDC-Kaiser; Felitti et al., 1998) with individual items from MIDUS-I and MIDUS-II. Thus, the composite score is a single measure that includes items from MIDUS-I and -II. Items related to parental divorce (MIDUS-I; response rate: 94%, n = 1,873), living with a household member with a substance use issue (MIDUS-I; response rate: 99%, n = 1,974), sexual abuse (MIDUS-II; response rate: 91%, n = 1,815), emotional abuse (MIDUS-I; response rate: 99%, n = 1,972), physical abuse (MIDUS-I; response rate: 98%, n = 1,954), emotional neglect (MIDUS-I; response rate: 89%, n = 1,775), moved frequently (MIDUS-I; response rate: 96%, n = 1,914), and financial distress (MIDUS-I + II; response rate: 88%, n = 1,755) were responded to on a Likert scale that assessed frequency. For example, the following question was used to measure emotional abuse,

> When you were growing up, how often did your mother/the woman who raised you (father/the man who raised you) insult you or swear at you; sulk or refuse to talk to you; stomp out of the room; do or say something to spite you; threaten to hit you; smash or kick something out of anger?

on a 4-point Likert scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*). Following Danielson and Sanders (2018), eight dichotomous categories were created (with "1" indicating the presence of an ACE category) denoting type of ACE. To create the cumulative measure, these were summed to produce a total count, with higher scores denoting more risk exposure to ACEs (α = 0.61; range = 0–7). See Supplemental Table S1 for comprehensive measurement details, its relation to the original CDC measure, and Danielson and Sanders's (2018) rationale for item inclusion.

Daily Positive and Negative Affect

Every evening, participants reported how much of the time in the past 24 hr they experienced 13 positive affect items (*in good spirits, cheerful, extremely happy, calm and peaceful, satisfied, full of life, close to others, like you belong, enthusiastic, attentive, proud, active, confident*; α = .78),[1] and negative affect items (*restless or fidgety, nervous, worthless, so sad nothing cheer you up, everything was an effort hopeless, lonely, afraid, jittery, irritable, ashamed, upset, angry, frustrated*; α = .71) on a 5-point scale (1 = *none of the time*; 5 = *all of the time*). The affect terms were selected using a combination of the Positive and Negative Affect Schedule (Watson et al., 1988) and the Nonspecific Psychological Distress Scale (Kessler et al., 2002). These affect items have been used in many empirical studies (e.g., Almeida et al., 2020). Individual items were averaged within-persons to create a total PA score (M = 2.73; SD = 0.75; Mdn = 2.01; Mode = 2) and a total NA score (M = 0.19; SD = 0.33; Mdn = 0.12; Mode = 0). Emotional reactivity was therefore defined as above or below one's own average levels of affect on days when a positive or negative event was reported (see also Zautra et al., 2005).

Daily Events

Negative Events. These were measured with a seven-item version of the Daily Inventory of Stressful Events (Almeida et al., 2002). Each day, participants were asked whether they had experienced the following event: (a) *argument/disagreement with anyone*, (b) *avoided argument/disagreement*, (c) *stressful event at work or school*, (d) *stressful event at home*, (e) *a stressful event related to a close friend/relative*, (f) *any other stressful event*, (g) *race, sex, or age discrimination*. A binary variable was created to reflect whether (1) or not (0) at least one of these negative events occurred on that day.

Positive Events. Participants reported whether they had experienced the following events in the past 24 hr: (a) *positive social interactions* (*e.g.*, "sharing a laugh," "having a good conversation"), (b) *positive event at work, school, or at a volunteer position*, (c) *positive event at home*, (d) *network positive event (i.e., positive event that happened to a close friend or relative)*, and (e) *any other positive event* (see Sin et al., 2017, for further details). As with the above, a binary variable was created to reflect whether (1) or not (0) at least one of these positive events occurred on that day.

Covariates

Analyses included participants age (grand-mean-centered), sex (0 = *female*; 1 = *male*),[2] education (1 = *no school or some grade school*; 12 = *doctoral or other professional degree*; grand-mean-centered), and race (0 = *White*; 1 = *non-White*), to adjust for sample heterogeneity and because these are frequently used demographic variables thought to influence adversity (see Evans et al., 2013). Analyses additionally accounted for chronic conditions (participants were asked to list the number of chronic conditions they have in the last 12 months; range = 0–27; grand-mean-centered), self-reported physical health ("In general, would you say your physical health is, …" 1 = *poor*; 2 = *fair*; 3 = *good*; 4 = *very good*; 5 = *excellent*; grand-mean-centered), and indicators of adult socio-economic status, namely household income (0 = *less than $0*; 42 = *$200,000 or more*; grand-mean-centered) and employment status (0 = employed, 1 = unemployed), because of their associations with daily stress and affect (Jachimowicz et al., 2022) and because of the links between ACEs and adult socioeconomic status (Metzler et al., 2017) and physical health (Kong, Liu, et al., 2021). Covariates were taken from MIDUS-II.

Data Analysis

Multilevel models were used to accommodate data nested within-persons and across days. PA and NA were modeled (separately) as outcomes in all models. Daily positive and negative events were modeled simultaneously meaning that above-average PA or NA on days with a positive (or negative) event pertains to days without a co-occurring negative (or positive) event. The cumulative-risk approach and the adversity-type approach were tested in separate

[1] Internal consistency was established within-persons, as per recommendation (e.g., Brose et al., 2020).

[2] Note that specifying male as the reference category does not change the overall pattern of results.

models (but are referred to in models as "ACE" for simplicity; see Supplemental Material S8 and S9 for the full equation for each model). When testing individual adversities (e.g., emotional abuse) all other individual adversities were included in analyses (e.g., physical, emotional, sexual abuse, etc) to statistically account for their interrelation (as per recommendation: Evans et al., 2013). Level 1 was specified as

$$\begin{aligned}\text{Affect}_{ti} = \beta_{0i} + \beta_{1i}(\text{Daily positive event}_{ti}) \\ + \beta_{2i}(\text{Daily negative event}_{ti}) + e_{ti},\end{aligned} \quad (1)$$

where Affect_{ti} of person i at time t is a function of a person-specific intercept (β_{0i}), person-specific coefficients indicating the extent to which affect is associated with daily positive events (β_{1i}) and the extent to which affect is associated with daily negative events (β_{2i}), as well as residual error (e_{ti}). Between-person differences in intercept and emotional reactivity to positive and negative events were modeled as

$$\begin{aligned}\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{Age}_i) + \gamma_{02}(\text{Women}_i) \\ + \gamma_{03}(\text{Education}_i) + \gamma_{04}(\text{Race}_i) \\ + \gamma_{05}(\text{Household Income}_i) + \gamma_{06}(\text{Employment}_i) \\ + \gamma_{07}(\text{Chronic Conditions}_i) \\ + \gamma_{08}(\text{Self-Report Health}_i) + \gamma_{09}(\text{ACEs}_i) + u_{0i},\end{aligned} \quad (2)$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11}(\text{ACEs}_i), \quad (3)$$

$$\beta_{2i} = \gamma_{20} + \gamma_{21}(\text{ACEs}_i), \quad (4)$$

where γ_{00} represents prototypical levels of positive or negative affect, γ_{10} indicates prototypical levels of emotional reactivity to positive events, and γ_{20} indicates prototypical levels of emotional reactivity to negative events. Parameter $\gamma_{01\text{-}09}$ indicates the extent to which within-person differences in affect is related to covariates and ACEs. Parameter γ_{11} indicates the extent to which differences in emotional reactivity to positive events are related to ACEs. Parameter γ_{21} indicates the extent to which differences in emotional reactivity to negative events are related to ACEs. Person i's deviation from the intercept is denoted by u_{0i}. Incomplete data treated were as missing-at-random under full information likelihood (Little & Rubin, 2019).

Transparency and Openness

Data and documentation for all of the MIDUS projects are freely available and accessible (https://www.icpsr.umich.edu/web/ICPSR/series/203; https://midus.colectica.org). Statistical models were implemented in SAS PROC MIXED Version 9.4. The SAS script (code) and a table of variables (and their codes) downloaded from the MIDUS website can be found at https://osf.io/frzwt/. This study was not preregistered.

Results

Descriptive statistics and intercorrelations among key study variables can be found in Table 1. Respondents reported an average of at least one negative event on 40% of the study days ($SD = 0.48$), and at least one positive event on 70% of the study days ($SD = 0.46$). On average, 10% of days included both positive and negative events, 60% of days only had a positive event, and 30% days only had a negative event. About half of the sample were female (56%, $N = 1{,}031$), and the majority were White (93.52%, $N = 1{,}688$) and married (72.64%, $N = 1{,}338$). The average age was 55 years, with a range of 35–86 years ($SD = 12.27$). At MIDUS-II, respondents reported an average of two chronic conditions ($M = 2.31$, $SD = 2.31$; range = 0–17) and had 3+ years of college ($M = 7.23$, $SD = 2.44$). On average, respondents reported at least one ACE ($M = 1.18$, $SD = 1.41$). In line with theory and evidence of the co-occurrence and interrelatedness of ACEs (see Evans et al., 2013; McLaughlin & Sheridan, 2016), positive correlations among individual adversities were detected, with correlations ranging between $r = .08$ and .64. See Supplemental Table S2 for mean-level differences in key study variables based on a median-split of low versus high levels of ACEs.

Emotional Reactivity to Positive and Negative Events

As can be seen in Tables 2 and 3, evidence arose for emotional reactivity to positive and negative events. For example, consistent with extant evidence, emotional reactivity to negative events was detected across all models (i.e., significant within-person associations of daily negative event and affect): Reporting a negative event was associated with reporting below-average PA and above-average NA per day. Likewise, evidence arose for emotional reactivity to positive events (i.e., significant within-person associations of daily positive event and affect): Reporting a positive event was associated with above-average PA per day but was unrelated to NA.[3]

Moderation by Cumulative Adverse Childhood Experiences

Results are reported in Table 2. Evidence arose for the moderating role of cumulative ACEs for emotional reactivity to positive and negative events. As can be seen in Figure 1(A), cumulative ACEs were associated with emotional reactivity to positive events, with *increases in NA* detected on days with a positive event ($\beta = 0.01$; $p = .0004$). As can be seen in Figure 1(B), cumulative ACEs were also associated with emotional reactivity to negative events, with above-average increases in NA detected on days with a negative event ($\beta = 0.02$; $p = .0003$). No moderating effects were found for emotional reactions in PA toward positive or negative events. This pattern of results remained when tested without covariates (see Supplemental Table S4).

Moderation by Individual Adverse Childhood Experiences

Results are reported in Table 3. We found evidence for the moderating role of individual types of ACEs for emotional reactivity to positive and negative events. Beginning with emotional reactivity to positive events, only one adversity related to household challenge/dysfunction, namely, parental substance abuse, was significantly associated. As can be seen in Figure 2(A), living with parents with substance abuse problems was associated with *increases* in NA on days with a positive event ($\beta = 0.01$; $p = .0004$) but was unrelated to PA. No other adversities related to household challenge/

[3] Main effects remained when tested without covariates (see Supplemental Table S3).

Table 2
Multilevel Models Testing the Moderation of Emotional Reactivity to Positive and Negative Events by Cumulative Adverse Childhood Experiences (ACEs)

	Positive affect			Negative affect		
		95% CI			95% CI	
Variable	Est.	*LL*	*UL*	Est.	*LL*	*UL*
Intercept	2.40*	2.38	2.52	0.13*	0.09	0.15
Age	0.01*	0.01	0.01	–0.002*	–0.003	–0.002
Sex (female)	0.08*	0.01	0.15	0.001	–0.02	0.02
Race (White)	0.01	–0.08	0.11	–0.001	–0.05	–0.09
Education	–0.02*	–0.03	–0.01	–0.0001	–0.01	0.003
Household income	0.02*	0.01	0.08	–0.01*	–0.03	–0.001
Employment status	0.02	0.01	0.02	–0.02*	–0.04	–0.02
Health self-report	0.09*	0.05	0.13	–0.01*	–0.03	–0.001
Chronic condition	–0.04*	–0.05	–0.02	0.02*	0.01	0.024
ACE	–0.04*	–0.07	–0.02	0.003	–0.01	0.01
Negative event	–0.15*	–0.17	–0.14	0.17*	0.16	0.18
Positive event	0.08*	0.04	0.13	0.01	0.01	0.01
Daily Neg. Event × ACE	–0.008	–0.07	0.06	0.02*	0.01	0.03
Daily Positive Event × ACE	–0.001	–0.01	0.15	0.01*	0.005	0.02
Variance intercept	0.34	0.32	0.38	0.05	0.03	0.04
Residual variance	0.16	0.14	0.18	0.04	0.039	0.042

Note. Est. = Estimate; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; Neg. = negative.
* $p < .05$.

dysfunction, nor any related to threat or deprivation, were associated with emotional reactivity to positive events.

As can be seen in Figure 2(B)–(E), all threat-based adversities and one adversity related to household challenge/dysfunction (but not those related to deprivation) were associated with emotional reactivity to negative events. Specifically, sexual abuse ($\beta = 0.05$; $p = .002$) and emotional abuse ($\beta = 0.04$; $p = .004$) were associated with above-average increases in NA on days with a negative event (but were unrelated to PA), while physical abuse ($\beta = –0.07$; $p = .001$) was associated with above-average decreases in PA on days with negative event (but was unrelated to NA). Likewise, parental divorce ($\beta = 0.03$; $p = .004$) was associated with above-average increases in NA on days with a negative event (but was unrelated to PA). This pattern of results remained when tested without covariates (see Supplemental Table S5).

Discussion

The present study examined whether ACEs moderated emotional reactions to everyday positive and negative events among middle-aged and older adults. Results revealed moderation by individual *and* cumulative ACEs for emotional reactivity to positive *and* negative events. Specifically, having experienced (a) more cumulative ACEs or (b) individual adversities characterized by threat (i.e., physical, emotional, sexual abuse) and/or by household challenge or dysfunction (i.e., parental substance abuse, parental divorce) were independently associated with emotional reactivity to negative events (i.e., above-average increases in NA and/or above-average declines in PA) and/or to positive events (i.e., *increases* in NA on days with a positive event). These findings extend the study of daily emotion dynamics in a number of important ways. First, they demonstrate that prevalent childhood adversities are associated with a broad range of everyday emotional experiences in nonclinical populations (Dunn et al., 2018; Riediger & Bellingtier, 2022). Second, they extend previous research by providing insight on adversity-specific moderation effects while statistically accounting for multiple interrelated adversities and a wide range of covariates. In doing so, they provide support for the view that childhood adversities characterized by prolonged stress exposure (but not those characterized by deprivation) are potentially important for emotional reactivity in adulthood (e.g., McLaughlin & Sheridan, 2016). Third, they extend existing work on ACEs and emotional reactivity to negative events by providing first evidence that the deleterious effects of child adversity may extend to the experience of positive events.

Emotional Reactivity to Negative Events: Moderation by Adverse Childhood Experiences

Findings on the moderation of emotional reactivity to negative events address conceptual accounts of the links between early adversity and everyday emotional experiences in adulthood (e.g., Bronfenbrenner & Evans, 2000; Evans et al., 2013; Sheridan et al., 2020). In particular, evidence that cumulative ACEs were associated with higher levels of reactivity to negative events supports the dominant cumulative-risk perspective that emotional development is impacted through physiological *wear-and-tear* due to prolonged stress exposure from frequently co-occurring adversities (Bronfenbrenner & Evans, 2000; McEwen, 1998, 2003). Importantly, these findings substantiate existing research in nonclinical populations with a comprehensive measure that includes a broader range of adversities than in previous work (i.e., household challenge/dysfunction; e.g., Kong, Martire, et al., 2021), while also accounting for a range of important covariates (e.g., adult health, education, and income), speaking to the robustness of the associations.

Evidence of adversity-specific associations offers a complimentary perspective by demonstrating the potential role of individual

Table 3

Multilevel Models Testing the Moderation of Emotional Reactivity to Positive and Negative Events by Individual Adverse Childhood Experience

	Positive affect			Negative affect		
		95% CI			95% CI	
Variable	Est.	*LL*	*UL*	Est.	*LL*	*UL*
Intercept	2.62*	2.51	2.72	0.13*	0.09	0.17
Age	0.01*	0.01	0.01	–0.002*	–0.003	–0.001
Sex (female)	0.06	–0.00	0.13	–0.002	–0.02	0.02
Race (White)	0.007	0.04	0.09	0.01	0.009	0.0
Education	–0.03*	–0.04	–0.01	–0.001	–0.01	0.003
Household income	0.02*	0.05	0.13	–0.01*	–0.03	–0.001
Employment status	0.01	0.01	0.01	–0.02*	–0.04	–0.02
Health self-report	0.10*	0.06	0.14	–0.01*	–0.03	–0.002
Chronic condition	–0.04*	–0.05	–0.02	0.02*	0.01	0.02
Daily negative event	–0.15*	–0.17	–0.14	0.17*	0.16	0.18
Daily positive event	0.09*	0.07	0.11	–0.00	–0.00	0.00
ACE 1 (parental divorce)	0.02	–0.08	–0.11	–0.02	–0.05	0.01
ACE 2 (parent subs. abuse)	–0.11*	–0.19	–0.02	0.02	–0.01	0.05
ACE 3 (sexual abuse)	–0.11*	–0.23	–0.004	0.03	0.01	0.09
ACE 4 (physical abuse)	0.08	–0.10	0.25	–0.06*	–0.11	0.001
ACE 5 (emotional abuse)	–0.08	–0.22	0.06	0.04*	0.02	0.08
ACE 6 (emotional neglect)	–0.13*	–0.19	–0.10	0.01	–0.03	0.05
ACE 7 (moved frequently)	–0.03	–0.11	0.04	0.01	–0.01	0.04
ACE 8 (financial distress)	0.003	–0.08	0.09	0.01	–0.02	0.04
Daily Neg. Event × ACE 1	–0.02	–0.11	0.04	0.03*	0.01	0.06
Daily Neg. Event × ACE 2	–0.001	–0.01	0.01	0.01	–0.09	0.09
Daily Neg. Event × ACE 3	0.001	0.01	0.01	0.05*	0.02	0.08
Daily Neg. Event × ACE 4	–0.07*	–0.14	–0.008	0.001	–0.02	0.02
Daily Neg. Event × ACE 5	–0.004	–0.09	0.06	0.04*	0.01	0.07
Daily Neg. Event × ACE 6	–0.002	–0.07	0.07	0.002	–0.03	0.02
Daily Neg. Event × ACE 7	–0.01	–0.10	0.04	0.02*	0.0003	0.04
Daily Pos. Event × ACE 1	0.0001	–0.001	0.001	–0.002	–0.03	0.04
Daily Pos. Event × ACE 2	0.006	–0.04	0.03	0.02*	0.01	0.05
Daily Pos. Event × ACE 3	–0.002	–0.03	0.01	–0.002	–0.07	0.07
Daily Pos. Event × ACE 4	0.0001	–0.002	0.002	0.01	–0.09	0.10
Daily Pos. Event × ACE 5	0.003	–0.02	0.02	0.001	–0.05	0.05
Daily Pos. Event × ACE 6	0.0001	0.0001	0.001	–0.004	–0.08	0.08
Daily Pos. Event × ACE 7	0.0001	0.0001	0.001	–0.02	–0.16	0.19
Variance intercept	0.36*	0.32	0.39	0.04*	0.036	0.05
Residual variance	0.16*	0.15	0.17	0.05*	0.046	0.051

Note. Est. = Estimate; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; Subs. = substance; Neg. = negative; Pos. = positive.

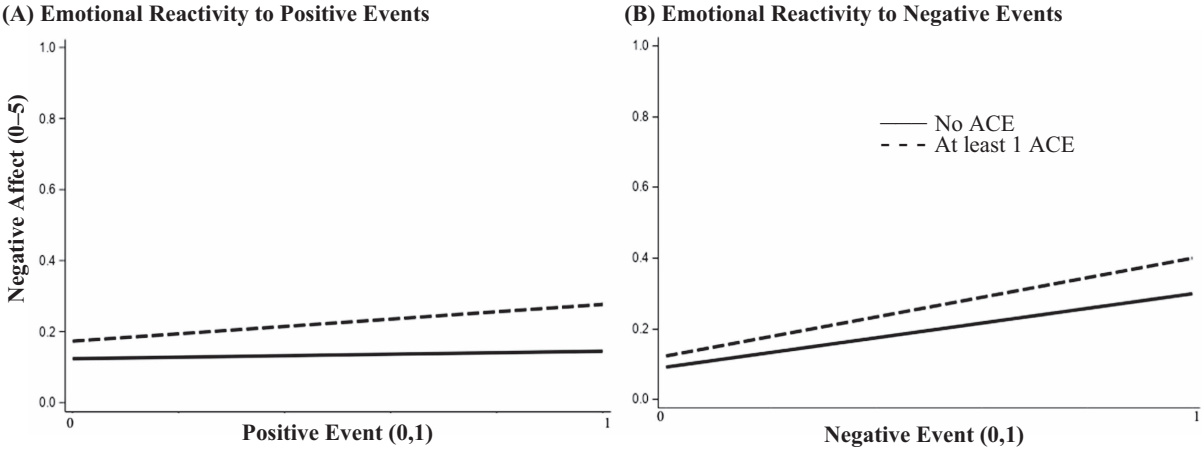
* $p < .05$.

adversities beyond cumulative risk. Consistent with expectations, adversities related to threat (i.e., physical, sexual, emotional abuse), but not those related to deprivation (i.e., emotional neglect) were independently associated with higher levels of emotional reactivity to negative events. As threat-based adversities are centrally characterized by toxic stress exposure, these findings provide further support for the central role of *stress dysregulation* in linking ACEs to emotional reactivity to negative events. This pathway may explain why one indicator of household challenge/dysfunction, namely, parental divorce, was also associated with elevated reactivity: Theoretical frameworks on family dissolution emphasize the perceived stressfulness of divorce for children and the deleterious effects such stress can have on emotion regulation (e.g., Felner et al., 1988). This does not explain, however, why other household challenges known to be experienced as stressful by children, namely, financial distress and moving house frequently (e.g., Pettit, 2004; Santiago et al., 2011), were unrelated to emotional reactivity to negative events. One explanation is that the levels of stress associated with these adversities was less severe or did not constitute *toxic* stress exposure compared to adversities characterized by harm or by the threat of harm (e.g., physical abuse). To explore this further, future studies should target the (relative) perceived stressfulness of different types of ACEs and test their severity and chronology for later life emotional reactivity.

Contrary to expectations, deprivation-based adversities (i.e., emotional neglect) were not associated with below-average NA on days with a negative event. This is unexpected as such adversities are typically characterized by insecure attachment and inhibited emotional displays, including blunted or infrequent emotional reactions (e.g., Eilert & Buchheim, 2023). Because the MIDUS measure did not track severity or timing, it might be the case that the emotional neglect experienced by participants in this study occurred outside particularly sensitive windows of emotional development or else did not meet the threshold for deleterious effects to take place.

Figure 1

Emotional Reactivity to Positive and Negative Daily Events: Moderation by Cumulative Adverse Childhood Experiences



Note. On days when participants reported a positive event (Plot A) or a negative event (Plot A), they also reported more negative affect. The relative increase in negative affect with the experiencing of stressor(s) is significantly more pronounced among those who had reported an adverse childhood experience (dashed line) relative to those who had not (solid line).

Indeed, the impact of child adversity on emotional development is known to depend on developmental timing (Dunn et al., 2018), with evidence that emotional neglect is most harmful if perpetrated by a caregiver during infancy (first 2 years of life), whereas the area of the brain associated with emotional processing appears to adapt to emotional neglect experienced in later childhood and adolescence (Eilert & Buchheim, 2023). As childhood adversities were self-reported in adulthood, neglect experienced during the first few years of life might not have been remembered or reported. Ergo, the emotional neglect measure in this study likely represents participants who experienced emotional neglect at later stages of childhood or adolescence, which may have attenuated associations. This underscores the importance of substantiating findings with objective measures of ACEs (i.e., via court cases; adoption or foster records) and/or with measures that track severity and chronology (see the Limitations section for a full discussion).

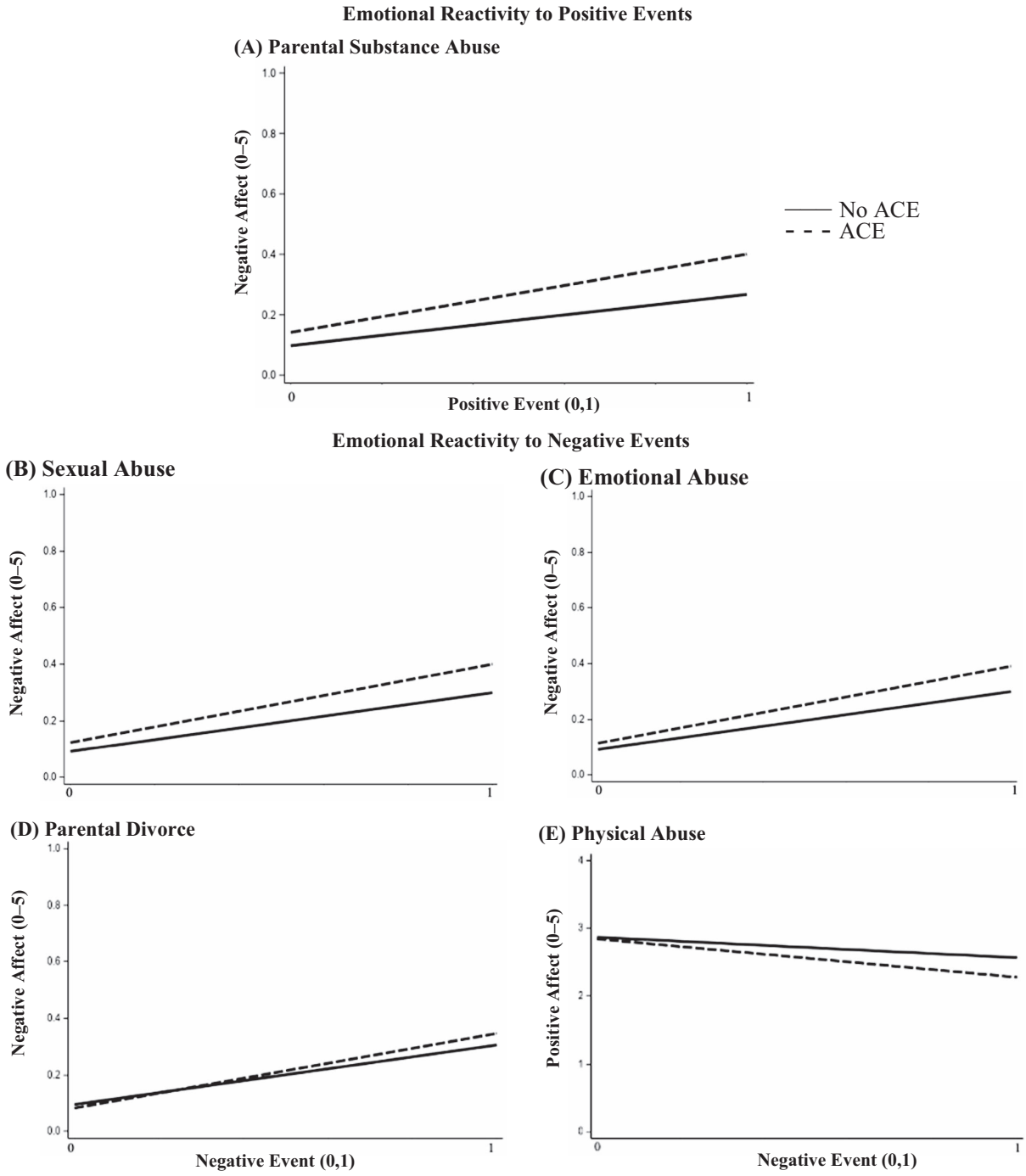
Emotional Reactivity to Positive Events: Moderation by Adverse Childhood Experiences

These findings address conceptual accounts of differential susceptibility and in doing so considerably extend existing research on ACEs and emotional reactivity to negative events by providing first evidence that the well-established deleterious role of child adversity for emotional reactivity potentially spread to *positive events*. In particular, cumulative ACEs and a single adversity related to household challenge/dysfunction (but none related to threat or deprivation) were unexpectedly associated with *higher* NA on days with a positive event. In other words, adults who experienced more cumulative ACEs and/or those who lived with a parent with substance abuse issues as a child, reported increased NA on days with a so-called positive event. This is in contrast to conceptual accounts indicating that those with a history of ACEs may disproportionately benefit from positive daily experiences (Belsky & Pluess, 2009; Pluess & Belsky, 2013). These findings are also in contrast to initial evidence from Infurna et al. (2015) that cumulative ACEs were associated with *higher levels* of well-being on days with a positive event. However, the cumulative-risk score used by Infurna et al. (2015) was based on threat-based adversities (namely physical, emotional, sexual abuse), overlooking adversities related to deprivation and household challenge or dysfunction. This implies that a wider variety of co-occurring ACEs contribute to cumulative risk and link to higher levels of NA on days with a positive event, but that experiencing a narrower range of adversities (i.e., abuse-related adversities) may lead to differential susceptibility with the potential for resilient outcomes (reflected in higher levels of well-being on days with a positive events).

One explanation for these findings drawn from the constructed emotion theory (Barrett, 2017a, 2017b) is that early adversity influences *core affect* and *categorization* processes by generating a more extensive repertoire of negatively valanced emotion concepts, thereby reducing the brain's predictive ability to incorporate positive experiences (Barrett, 2017a). Not only would this predict an increase in one's propensity to respond negatively toward positive events, but it may also result in the interpretation of seemingly positive events as threatening. This is consistent with evidence that ACEs are linked to poor discrimination between safety and threat that is known to underlie negative experiences of seemingly positive events (Alessandri et al., 2014; McLaughlin & Sheridan, 2016). This is also consistent with neurobiological evidence that ACEs alter the brain regions involved in emotional regulation leading to impairment in key abilities including awareness and discrimination (Teicher & Samson, 2013) as well as difficulties in maintaining positive affect or quickly shifting from positive to negative emotions. A final possibility relates to *conservative behavioral strategies* (see Nesse, 2019; Van den Bergh et al., 2021) which refer to a set of strategies often used by those who have experienced chronic stress or adversity to minimize risk and avoid potential threats. Such strategies include a tendency to focus on negative aspects of situations or to expect negative outcomes (Nesse, 2019). However,

Figure 2

Emotional Reactivity to Positive and Negative Daily Events: Moderation by Individual Type of Adverse Childhood Experience



Note. As can be seen in Plot A, when participants who lived with parents with a substance abuse problem (dashed line) reported a positive event, they reported increases in negative affect compared to those who did not experience this adversity (solid line). Likewise, on days when participants with a specific adversity (dashed line) reported a negative event (Plots B–E), they reported above-average increases in negative affect or above-average declines in positive affect (Plot E) compared to those who did not have that adversity (solid line).

given that these explanations do not fully account for why individual adversities beyond parental substance abuse were unrelated to emotional reactivity to positive events, further conceptual work on the mechanisms underlying these associations is urgently needed. Another interesting avenue for future research would be to examine the unique and interactive effects of positive and negative events. For example, on days with both positive and negative events, individuals may experience a buffering effect, where the positive event mitigates the impact of the negative event, or vice versa. Alternatively, these mixed-event days could intensify affective response as contrasting emotions could lead to heightened psychological arousal or even ambivalence. Prior research suggests that such emotional complexity might have distinct impacts on well-being and coping strategies, reflecting a more complex interaction than a simple additive model can capture (e.g., Ong & Ram, 2017). Another important step for future work would be to examine the interaction effects with key sociodemographic characteristics, including race and sex. For example, marginalized groups, particularly those marginalized on the basis of ethnic or racial identity, often face additional systemic barriers and discrimination that could increase the prevalence and severity of early adversity or else deplete coping and adaption resources that might otherwise mitigate the impact of adversity on emotional development. It is also possible that gender-based patterns of early adversity (e.g., gender-based abuse) influence levels and severity of exposure, underscoring the need to examine gender differences (see LoPilato et al., 2020 for an examination of gender in stress perception following child adversity).

Taken together these initial findings on emotional reactivity to positive versus negative events may provide impetus for research into the adaptability of emotional reactivity and its associations with a range of physical, psychosocial, and emotional outcomes. To illustrate, initial evidence that ACEs were linked to *increased* NA on days with a positive event implies that the well-established effects of child adversity on reactivity to negative events could potentially extend to positive events. These findings are therefore relevant to childhood trauma and developmental psychopathology research, as they imply that those with a history of ACEs might be impacted not only by the accumulation of (negative) emotional reactions to negative daily events but potentially also to positive events (Hoppen & Chalder, 2018). More broadly, findings might be of interest to positive psychology and lifespan developmental researchers by providing initial evidence that emotional reactivity to positive events is potentially compromised in those with a history of disrupted emotional development (e.g., Bryant & Veroff, 2007; Fredrickson, 2001).

On a final note, when taken together, results on the moderating role of individual and cumulative ACEs underscore the utility and importance of employing multiple operationalizations of ACEs. By doing so, we were able to provide insight on the distinct but complimentary ways in which ACEs are associated with later life emotional reactivity. In other words, our findings support the dominant view that when multiple overlapping adversities co-occur, their cumulative presence overwhelms the psychological system, regardless of type, to trigger toxic stress responses (e.g., McEwen, 1998). As with extant evidence, this appears to be associated with exacerbated emotional responses to negative events (e.g., Kong, Martire, et al., 2021; Poon & Knight, 2012) and potentially with dampened emotional responses to positive events (but see Infurna et al., 2015). Thus, even if different adversities do not contribute equally to cumulative risk or are not associated with emotional reactivity to the same degree or even in the same direction, it is the experiencing of these together that is potentially critical for emotional development and everyday emotional experiences in adulthood. Yet, at the same time, our adversity-specific findings contribute to the growing literature on differential associations. This is important because not everyone who experiences one adversity will necessarily experience another. Therefore, in order to provide a more comprehensive and nuanced picture of the associations among ACEs and everyday emotional experiences in adulthood, broader and more inclusive approaches—such as the dual implementation of cumulative and individual ACEs—are needed. Further research using such approaches could be useful for delineating the specific ways in which each adversity is associated with emotional development across different emotional valences (i.e., positive and negative discrete emotions) and in different contexts (i.e., daily events differing in their positivity and negativity).

Limitations

The measures used in this study were limited in a number of ways. To begin with, although our operationalization of ACEs was developed by Danielson and Sanders (2018) to match the original CDC measure (Felitti et al., 1998), it omitted a number of important adversities related to physical neglect (see Supplemental Table S1 for an extensive overview). It is therefore important to substantiate findings with operationalizations of ACEs that include such measures, especially given the prevalence of childhood physical neglect in the adult (general) population (~16% in Europe: Sethi et al., 2018), and the impact this can have on emotional development (e.g., Hildyard & Wolfe, 2002). Moreover, although a central aim of this study was to build upon existing research by implementing the widely used ACEs measure, this meant excluding many key experiences related to childhood adversity available in MIDUS (e.g., physical/emotional abuse perpetrated by a sibling; see Ferraro et al., 2016; Jung, 2018). Given that a broad range of experiences can denote or reflect child adversity (see Evans et al., 2013), an important next step is to develop a more comprehensive measure using a wider variety of MIDUS items. Another issue is that it lacked specificity, such as timing (other than stipulating that adversities occur before the age of 18) and duration, which overlooks potentially sensitive periods of development (Dunn et al., 2018). Indeed, previous research has found that emotional reactivity was stronger for individuals who experienced adversity before the age of 10 (Glaser et al., 2006), implying that associations might have been stronger if adversities were measured at an earlier age. Given that prolonged exposure to adversity and age at adversity exacerbate impact on emotional development (e.g., Dunn et al., 2018), it is important for future research to examine associations among the intensity and chronicity of ACEs and everyday emotional experiences in adulthood. Finally, although the retrospective nature of the ACEs measure could be subject to recall error, studies have reported good-to-excellent test–retest reliability (Yancura & Aldwin, 2009). Moreover, it has been argued that subjective perceptions of child adversity matter most for emotional outcomes, with evidence that the development of emotional disorders do not significantly differ among those who did not report ACEs despite being identified as having experienced childhood adversity in legal cases (Danese & Widom,

2020). In addition, from a practical perspective, it is useful to record retrospective ratings as up 56% adults who report childhood maltreatment have no prospective measures (e.g., court case).

Although a large-scale national probability sample was used, the design of this study was limited. In particular, although there was no opportunity to extend the number of daily assessments in NSDE-II, further ratings of daily affect and positive and negative events may have provided more reliable and ecologically valid estimates of emotional reactivity to positive and negative events.

Constraints on Generality

Finally, we acknowledge the generalizability of the MIDUS sample is limited. Indeed, the sample may not reflect characteristics of the general population because of attrition in MIDUS-II. According to Ryff et al. (2015), higher retention rates for MIDUS-II were found among respondents who were White, female, and married, as well as those with better self-reported health and higher levels of education. We also note that while MIDUS-I, MIDUS-II, and NSDE-II had similar distributions for age as well as for marital and parenting status, the NSDE-II subsample had better educated participants on average as well as more females and fewer minority participants. In addition, there is a lack of ethnic and racial diversity in MIDUS, with the majority of the sample comprising participants from European and American backgrounds. We therefore strongly encourage future research to corroborate findings in more representative samples.

Conclusion

Taken together, the results of this study demonstrate that emotional reactivity to positive and negative events in the daily lives of adults and older adults is associated with early life adversity. In particular, this study showed that experiencing more cumulative ACEs and/or being exposed to individual adversities characterized by threat or household dysfunction/challenge in childhood were (independently) associated with emotional reactivity to negative events (i.e., above-average increases in NA/decreases in PA) and/or positive events (i.e., increases in NA). These findings contribute to literature on early life experiences and later life emotion dynamics and emphasize the utility and importance of examining such associations in the general population using a multimeasurement approach. Findings on associations between early adversity and emotional reactivity to positive events provide initial insight into the potential consequences of early adversity beyond reactivity to negative events. In addition to lifespan research on emotion, findings may be of interest to child trauma and developmental psychopathology as well as researchers from the stress and positive psychology literature.

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