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Ph.D. THESIS SUMMARY

UNRAVELING THE LINK BETWEEN CHILDHOOD ADVERSITY AND POSITIVE AFFECT: INSIGHTS FROM THE ROLE OF POSITIVE EMOTION REGULATION

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CHAPTER I. THEORETICAL FOUNDATIONS AND REVIEW OF THE LITERATURE

1.1. Childhood Adversity - overview

Childhood adversity (CA) comprises a broad spectrum of stressful or potentially traumatic events that occur during childhood and adolescence (i.e., before age of 18) (Felitti et al., 1998; Reuben et al., 2016). It refers to negative environmental experiences that deviate from the expectable norm and are likely to require substantial adaptative efforts from an average child (McLaughlin, 2016). These experiences include maltreatment, household dysfunction, and other potentially traumatic experiences. Childhood maltreatment (CM) is a prevalent and severe form of adversity and it encompasses "any act of commission (i.e., abuse) or omission (i.e., neglect) by a parent or other caregiver that result in harm, potential for harm or threat of harm to a child, even if harm is not the intended result" (Leeb et al., 2008. p.11). Childhood abuse consists of physical, sexual, and emotional abuse (Cicchetti, 2016; Leeb et al., 2008; Massullo et al., 2023). Meanwhile, childhood neglect is generally defined as the failure to fulfill a child's basic needs (Leeb et al., 2008). These needs include the following categories: physical needs, emotional needs, educational needs, medical needs, and adequate supervision (Barnett et al., 1993; Leeb et al., 2008; Straus & Kantor, 2005).

Household dysfunction is marked by one or more adverse conditions in the home environment, each capable of significantly affecting a child's well-being and developmental trajectory. These include exposure to substance abuse, mental illness or suicide attempts, incarceration of a household member, domestic violence, and parental separation or divorce (Felitti et al., 1998). More recent literature has extended the array of CA to include exposure to community-level adversities, such as community violence, discrimination, bullying, unsafe neighborhoods, or foster care environments (Cronholm et al., 2015; Finkelhor et al., 2015; K. E. Smith & Pollak, 2021; Wade et al., 2016). Other childhood traumatic events, defined as experiences that pose a threat of injury, death, or harm to the child's physical integrity or that of others, can also be classified as early forms of adversity (Dalenberg et al., 2017).

Epidemiological studies have indicated that approximately 40-60% of the general population report experiencing at least one adverse childhood event and approximately 10-20% reported experiencing more than three such events (Crouch et al., 2019; Fanslow et al., 2021; Green et al., 2010; Kessler et al., 2010; Madigan et al., 2023; Merrick et al., 2018). Nevertheless, these estimates should be interpreted with caution given the fact that CA may be underreported across studies due to a series of factors (for a reviw see Baldwin et al., 2019).

1.1.1. Negative Consequences of Childhood Adversity

1.1.1.1. Childhood Adversity and Psychopathology

A substantial body of systematic reviews and meta-analyses has consistently associated CA with a higher lifelong risk of developing psychopathology (Abate et al., 2024; Hughes et al.,

2017; M. Li et al., 2016; Lipsky et al., 2022; McKay et al., 2022). A recent umbrella review, which included 68 systematic reviews and meta-analyses, provides convincing evidence that CA significantly increase the risk of common mental disorders (e.g., depression, anxiety) and suicidality, with odds ratios consistently indicating at least a two-fold increase in risk (Sahle et al., 2022). The association between CA and psychopathology remains consistent across socioeconomic groups, gender and age of the exposure (Kessler et al., 2010; Sahle et al., 2022). According to Kim and Royle's umbrella review (2024), the cumulative effect of multiple CAs amplifies the risk for mental health disorders, highlighting the importance of the synergistic effects of CAs on mental health issues.

A body of research indicated that CA is not only associated with an increased risk for psychopathology, but it is also associated with a heightened persistence and severity of mental health disorders once they manifest, as well as reduced responsiveness to treatment and unfavorable course of illness (McLaughlin et al., 2010a; McLaughlin et al., 2010b; Nanni et al., 2012). Moreover, CA predicts higher comorbidity rates of mental health disorders and symptomatology (Chen, 2024; Hovens et al., 2012; Widom et al., 2007), which could further complicate the course of illness.

The impact of CA on specific mental disorders has been thoroughly investigated. Notably, meta-analytic data have shown associations between CA and depression, (M. R. Infurna et al., 2016; Nelson et al., 2017), anxiety (J. Liu et al., 2023; Zhang et al., 2023) psychosis (Varese et al., 2012), bipolar disorder (Palmier-Claus et al., 2016), eating disorders (Molendijk et al., 2017), substance use disorder (Grummitt et al., 2022), PTSD (Rameckers et al., 2021), and personality disorders (Crișan et al., 2023; Moreira et al., 2020; Porter et al., 2020). Mirroring this pattern of results, CA is also associated with a broad range of mental disorders in studies employing children and adolescents only samples (Bernardes et al., 2020; Docherty et al., 2018; Jaffee, 2017).

1.1.1.2. Childhood Adversity and Well-being

In recent years, a growing body of research has begun to investigate the negative impact of CA on positive mental health functioning (Stevenson, 2024). A great focus has been given to psychological well-being and its components. In a recent meta-analysis, CA was found to be moderately associated with a lower level of hedonic well-being (i.e., lower positive affect, higher negative affect, depression, anxiety) (Yeo et al., 2024). A similar pattern of results was also found in the case of eudaimonic well-being (e.g., sense of meaning, personal mastery).

Furthermore, Nair et al. (2024) showed that CA is associated with lower levels of both happiness and life satisfaction in young adults. This pattern of results remains similar when multiple types of CA are accounted for (Wang et al., 2022). Moreover, studies employing prospective measures also indicate that CA negatively predicts happiness and life satisfaction in adulthood, even when controlling for socioeconomic factors (Herrenkohl et al., 2012; Mosley-Johnson et al., 2019). Considering these preliminary findings, it appears that CA has a negative impact on hedonic well-being across life stages, gender and cultures (Yeo et al., 2024).

Given the high prevalence of CA (Madigan et al., 2023) and its detrimental costs on mental health and well-being (R. Gilbert et al., 2009) recent work have placed greater emphasis on investigating the psychological mechanisms that connects CA and psychopathology (Hales et al., 2023; McCrory et al., 2017; McLaughlin et al., 2019, 2020). Progress in this area holds important implications for refining preventive and therapeutic interventions targeted for this vulnerable population (Gee, 2022; Kirlic et al., 2020). Several mechanisms have received extensive support, such as emotion regulation (Miu et al., 2022), maladaptive cognitive schemas (Pilkington et al., 2021; Zhao et al., 2022) and reward processing (Kasparek et al., 2023; Oltean, Șoflău, et al., 2022). More recent work has started to examine mechanisms pertaining to positive psychology, such as self-compassion (for a review see Zhang et al., 2023) and gratitude (for a review see Zhu et al., 2024). However, other positive psychological factors remain largely underexplored, warranting further investigation to better understand their role as potential mechanisms for the relationship between CA and mental health.

1.2. Childhood Adversity, Positive Affect, and Negative Mental Health Outcomes

1.2.1. Positive Affect - overview

Positive affect (PA) refers to a range of emotional states indicating pleasant engagement with the environment. On a dimensional level, PA can be defined as a trait (i.e., positive affectivity) or as a state (i.e., momentary PA) (Watson, 1988). PA is a key element of subjective well-being, contributing to the hedonic pursuit of happiness and overall well-being (Kesebir & Diener, 2008). A positive emotion occurs when PA is linked to a specific object, event, or cognitive interpretation, making it more complex and particular (Russell, 2003). Building on this, positive emotions can be defined as transient, multi-systemic responses (i.e., cognitive, behavioral, physiological, subjective) to the favorable evaluation of current life circumstances (Fredrickson & Cohn, 2008).

Fredrickson's broaden-and-build theory of positive emotions posits that positive emotions broaden people's momentary thought-action repertoires and drive actions that build enduring personal resources over time (Fredrickson, 1998, 2001, 2013). The theory posits that, unlike the narrow focus of negative emotions, positive emotions broaden cognitive and behavioral repertoires, fostering adaptability, flexibility, and openness to new experiences. Laboratory studies show that positive emotions broaden attention and perception, enhance creativity by fostering conceptual flexibility, and expand thought-action repertoires (Fredrickson & Branigan, 2005; Rowe et al., 2007). The second hypothesis of the broaden-and-build theory posits that the expanded breadth of cognitive and behavioral repertoires linked to positive emotions aids in *building* lasting biopsychosocial personal resources essential for generating and maintaining well-being and personal growth over time (Fredrickson, 2001, 2013). Individuals with higher levels of PA tend to be more self-assured, proactive, and creative, and they demonstrate greater cognitive flexibility, problem-solving skills, and social competence, contributing to success across life domains (Lyubomirsky et al., 2005).

1.2.2. Childhood Adversity and Positive Affect

In light of recent literature, PA is emerging as a potential candidate mechanism pertaining to well-being and positive functioning that could underly the relationship between CA and mental health. To begin with, the meta-analysis conducted by Lavi et al (2019), revealed that maltreated children exhibit significantly lower levels of PA compared to non-maltreated children. Interestingly, the pattern of low PA marked the greatest divergence between maltreated and non-maltreated children, suggesting that hyporeactivity to positive emotions developed by adversity-exposed children may serve as a significant vulnerability factor for psychopathology later in life.

Furthermore, childhood emotional maltreatment predicts lower levels of PA in adolescent samples (Arslan, 2018; Arslan & Yıldırım, 2022). In a study that employed an experience sampling approach, researchers indicated that CM predicts lower levels of momentary PA, suggesting that CA could negatively influence daily intensity of PA experience in adolescents (Pries et al., 2020). Moreover, adolescents who were exposed to multiple types of reported lower levels of PA, compared to those who were less exposed or were not at all (Riley et al., 2020).

Several cross-sectional studies revealed that CM is associated with lower levels of PA in adulthood (e.g., Xiang et al., 2021; Etter et al., 2013). Some research has found that a higher number of CAs (e.g., CM, household dysfunction) that individuals have been exposed to negatively correlates with PA, suggesting a potential cumulative effect (Bradley et al., 2013; Turiano et al., 2017). A subset of studies sought to investigate the influence of CA on momentary PA by employing experience sampling methodology. They collectively suggest that CA, especially CM, is consistently associated with lower levels of PA throughout the day in both healthy (F. J. Infurna et al., 2015, 2023) and clinical samples (Brick et al., 2021; Dokuz et al., 2022). Mirroring the findings on momentary PA, CA is associated with lower levels of positive emotionality in both healthy (Frewen et al., 2012) and clinical populations (Kaspersen et al., 2021). Overall, the aggregated evidence suggests that CA is associated with a higher persistence and chronicity of PA deficits over time. In terms of emotion differentiation, some studies found a negative association between CA and a few discrete emotions such as pride (Q. Li & Xiang, 2020), joy (Frewen et al., 2012) and gratitude (Zhu et al., 2024).

Taken together, these results indicate a consistent link between CA and blunted PA across developmental stages and distinct categories of both CA and PA. Through a developmental lens, blunted PA could be a result of prolonged or severe exposure to adverse early environments that demanded threat detection and avoidance as adaptive responses, at the expense of pursuing and cultivating positive experiences (McLaughlin & Lambert, 2017). Nonetheless, it is important to note that some investigations failed to detect this pattern of results, suggesting that the literature concerning this relationship is heterogenous (Iffland et al., 2014; Pole et al., 2007).

In recent decades, emotion regulation (ER) has become a central construct in affective science and a key indicator of mental health (Gross, 2024). Extensive research has established a robust link between CA and ER (Dvir et al., 2014; Gruhn & Compas, 2020; Lavi et al., 2019),

but fewer studies have focused on ER for positive emotions in particular (Goncharenko et al., 2021), leaving a significant gap in the literature. We argue that positive ER is a valuable factor to consider when trying to explain why individuals with a history of CA are more likely to experience lower levels of PA.

1.2.3. Positive Emotion Regulation

Emotion regulation "refers to the processes to influence which emotions one has, when one has them, and how one experiences or expresses these emotions" (Gross, 1998, p.275). The regulation of positive emotions involves distinct regulatory goals and strategies due to their unique characteristics and functions. The *upregulation* of positive emotions entails "strategies that people use to create, maintain, or enhance positive emotions such as joy, contentment and pride" (Livingstone & Srivastava, 2012, p.504). Conversely, the *downregulation* process comprise strategies intended to dampen or decrease pleasant emotional states (D. Nelis et al., 2011).

Savoring is one of the most thoroughly researched upregulating strategies and has been defined as "the capacity to attend to, appreciate, and enhance the positive experiences in one's life" (Bryant & Veroff, 2007 p. 9). It requires paying attention and appreciating past, present, or future positive events (Bryant, 2003). Positive rumination (PR) is a facet of savoring and is defined as "the tendency to respond to positive affective states with recurrent thoughts about positive self-qualities, positive affective experience, and one's favorable life circumstances" (Feldman et al., 2008, p. 509). Conversely, dampening is defined by "the tendency to respond to positive mood states with mental strategies to reduce the intensity and duration of the positive mood state" (Feldman et al., 2008, p. 509). More recent work has investigated an upregulating strategy called prioritizing positivity (PP) which is defined as a behavioral tendency through which individuals intentionally structure their daily activities and environments to facilitate the experience of naturally occurring positive emotions (Catalino et al., 2014).

Extensive research supports a positive link between savoring and PA, highlighting its role as an effective regulatory strategy (for a review see Bryant, 2021). A recent meta-analysis confirmed that savoring strategies boost PA among university students (Zheng et al., 2025). Studies focusing specifically on PR also show a strong positive relationship with PA, whereas dampening correlates with lower PA levels (for a review see K. E. Gilbert et al., 2013). Finally, extant research has indicated a positive association between PP and PA (Catalino et al., 2014).

There is a paucity of evidence regarding the association between CA and positive emotion regulation. Kiefer and colleagues (2023) revealed that CA positively predicts dampening, but not PR. A similar pattern of results was found by Stone and Sylvester (2025). However, Ion et al. (2023) found a negative association between CM and momentary savoring, in their daily diary study. In regards to prioritizing positivity, there are no studies to date that have examined its relationship with CA. The current evidence is both limited and inconsistent, emphasizing the need for further inquiry to better understand these associations.

1.2.4. Blunted Positive Affect, Positive Emotion Dysregulation, and Mental Health

Over the past decades, the role of PA dysfunction in psychopathology has received a lot of focus (Gruber et al., 2019). Particularly, reduced PA has been found to strongly and consistently relate to depression, both at a trait (Watson et al., 1988) and state level (Bylsma et al., 2011). Data from longitudinal studies reveal that lower levels of PA predict higher depressive symptoms over time, suggesting that blunted PA may serve as a risk factor for depression (for a review see Khazanov & Ruscio, 2016). A similar pattern of results was also found for anxiety (Gilbert, 2012; Khazanov & Ruscio, 2016). Global deficits in experiencing PA is a feature of post-traumatic stress disorder (PTSD) and numerous studies revealed that individuals with PTSD symptoms report lower levels of positive emotions compared to healthy controls (Pugach et al., 2023; Simons et al., 2021). These findings suggest that blunted PA may serve as a clinical marker for certain mental disorders (i.e., depression and PTSD) and may function as a transdiagnostic risk factor for psychopathology more broadly.

Growing evidence increasingly highlights positive emotion dysregulation as a potential risk factor for psychopathology (for reviews see Carl et al., 2013; Vanderlind et al., 2020). For instance, a recent meta-analysis revealed that dampening is positively associated with depression both cross-sectionally and prospectively (Bean et al., 2022). Moreover, dampening is positively associated with anxiety symptoms, (Eisner et al., 2009; Malivoire et al., 2022) and PTSD (Boelen, 2021; Wolkenstein et al., 2022).

While dampening has been more consistently linked to psychopathology, fewer studies have observed a negative association with PR, savoring, and PP (Carl et al., 2013; Vanderlind et al., 2020). Notably, lower levels of habitual PR are associated with increased depressive symptoms over time, highlighting the potential enduring impact of the strategy (Bijttebier et al., 2012; S. Nelis et al., 2015). Some research has also indicated a negative relationship between PR and PTSD symptoms (Lenferink et al., 2018; Wolkenstein et al., 2022). Eisner and colleagues (2009) revealed that savoring, as measured by SBI, was inversely associated with depressive and anxiety symptoms. Finally, a small number of studies have shown that PP predicts lower depressive symptoms (Catalino et al., 2014; Humphrey et al., 2022). Taken together, these findings suggest that while adaptive emotion regulation strategies may be less critical to the onset and severity of psychopathology compared to dampening, they should not be entirely overlooked as a potential risk factor given the evidence presented.

Only a few studies have investigated the mechanistic role of PA and positive ER for the association between CA and mental health. For instance, a recent study has shown that lower PA has a mediating role in the relationship between CM and life satisfaction, suggesting that blunted PA might be an underlying mechanism through which CM hinders one's life satisfaction in adulthood (Xiang et al., 2021). Moreover, childhood neglect was associated with greater depressive symptoms through decreased gratitude (Wu et al., 2018). To our knowledge, only two studies have investigated the mechanistic role of positive emotion dysregulation for the association between CA and mental health. Kiefer and colleagues (2023) have found that dampening, but not positive rumination, mediates the relationship between CM and PTSD

symptoms. Stone and Sylvester (2025) replicated this pattern of result on depressive symptoms. These findings suggest that blunted PA and positive emotion dysregulation may contribute to a better understanding of the impact of CA on mental health, albeit future research is needed.

1.3. Relevance and Impact of the Research

The current thesis aimed to investigate the association between CA and PA, and to explore the role of positive emotion regulation in shaping this relationship. We also considered how the interplay between these variables may influence psychopathology and well-being. The section below outlines the main contributions that this thesis seeks to elaborate.

Extensive research has been undertaken to uncover the underlying mechanisms linking CA to psychopathology, in an effort to guide the development of more effective preventive and therapeutic interventions. PA dysfunction, in particular diminished PA, has been proposed as a potential mechanism, given its detrimental influence on mental health. However, findings on the relationship between CA and PA remain mixed, and the mediator role of PA has received limited empirical support. Therefore, it is paramount to clarify the association between CA and PA, and to elucidate the mechanistic role of PA underlying the relationship between CA and psychopathology. Provided this role is supported, blunted PA could be considered a relevant risk factor for psychopathology in the context of CA exposure. In terms of clinical implications, this result would provide a compelling rationale for targeting PA in therapeutic interventions aimed at reducing psychopathology among individuals with a history of CA. In their recent review, Craske et al. (2024) argue for integrating PA-focused strategies in treatments for depression, anxiety, and trauma, noting that diminished PA is a transdiagnostic risk factor and core feature of disorders like depression and PTSD. Additionally, it can persist even after negative symptoms subside and predicts chronicity, relapse, and poor treatment response. Standard therapies frequently fail to effectively restore PA, thereby limiting full recovery. Encouragingly, novel interventions directly targeting PA have shown promise in reducing psychopathology, and improving well-being (Craske et al., 2019, 2023, 2024). In light of the evidence presented by Craske et al. (2024), the present thesis may offer a theoretical basis for integrating interventions that target diminished PA into psychological treatments for individuals with a history of CA. This is especially relevant, given that CA has been linked to reduced responsiveness to treatment and unfavorable course of illness (Nanni et al., 2012; Toth et al., 2020).

An important step toward understanding and clarifying the relationship between CA and PA is investigating the role of positive emotion regulation. By exploring if and how CA influences the way PA is regulated, we could unravel specific pathways that account for the diminished PA that individuals with CA exposure may present. Although recent findings regarding CA and positive emotion regulation are promising (Kiefer et al., 2023; Stone & Sylvester, 2025), the current literature remains limited in scope and depth. For example, most existing studies are cross-sectional and rely on correlational designs. Moreover, some emotion regulation strategies remain underexplored or entirely absent from existing empirical investigations, warranting further investigation.

Given that positive emotion dysregulation serves as potential risk for psychopathology (Carl et al., 2013; Vanderlind et al., 2020), it is essential to expand the theoretical understanding of its relationship to CA. Such theoretical expansion would also provide support for empirically testing psychological interventions aimed at enhancing adaptive emotion regulation strategies and reducing maladaptive ones, particularly in individuals with a history of CA. Emerging clinical studies show promising results in targeting adaptive positive emotion regulation strategies (e.g., savoring) to increase PA and decrease psychopathology symptoms (Craske et al., 2019; Kumar et al., 2024; LaFreniere & Newman, 2023), but the field remains in its early stages and has yet to adequately consider the influence of CA history.

CHAPTER II. OBJECTIVES AND GENERAL METHODOLOGY

The current thesis sought to investigate the relationships between childhood adversity, positive affect, and positive emotion regulation. Drawing upon the literature presented and the gaps it revealed, we aimed at addressing two sets of questions, encompassing several objectives outlined below.

The first set of questions relate to the direct and indirect pathways between CA, PA, and psychopathology. More specifically, we asked the following: Are CA and PA significantly associated, and if so, does PA mediate the relationship between CA and psychopathology? To address these research questions, we formulated the following objectives: (1) to systematically review the existing empirical evidence concerning the variables of interest, (2) to quantify the strength and direction of the associations among CA, PA, and psychopathology, (3) to test and estimate the indirect effect of CA on psychopathology through PA, and (4) to investigate potential moderators that may influence these associations. To meet these objectives, we conducted one-stage meta-analytic structural equation modeling (OSMASEM) review, which enabled us to examine the direct and indirect effects of the mediation model and to explore sources of heterogeneity among the included studies (i.e., potential moderator effects).

The second set of questions focused on the role of positive emotion regulation (i.e., positive rumination, dampening, savoring, and prioritizing positivity) in the relationship between CA and PA, while also considering their potential implications on mental health. Therefore, we specifically asked the following: (1) Is CA linked to the spontaneous use of positive emotion regulation strategies? (2) Does CA influence savoring capacity? and (3) Is CA associated with prioritizing positivity, and if so, can prioritizing positivity partially explain the link between CA and mental health? To address the first question, we formulated the following objectives: (1) to investigate the association between CA and momentary PA; (2) to investigate the association between CA and momentary adaptive positive emotion regulation (i.e., positive rumination); (3) to investigate the association between CA and momentary maladaptive positive emotion regulation (i.e., dampening); (4) to investigate the association between momentary positive emotion regulation and momentary PA. To meet these objectives, we conducted an experience sampling method study that allowed us to examine both the average and variability level of our

outcomes. In regard to the second question, our principal goal was to examine the moderating effect of CA on the effectiveness of savoring. Additionally, we analyzed the moderating effect of two other factors: positive childhood experiences and trait savoring. In order to fulfill these objectives, we conducted a between-subject experimental study that involved implementing a savoring strategy, following explicit guidance, in response to positive images. Finally, in order to address the third question, we outlined the following objectives: (1) to investigate the associations between CA, prioritizing positivity, PA, psychopathology symptoms, and life satisfaction, and (2) test the mediating role of PP and PA for associations of CA and the mental health outcomes. To meet these objectives, we conducted a cross-sectional study that employed a serial mediation design.

The current thesis extends the existing literature by advancing understanding of the interplay between CA, PA, and mental health, and by providing insights into the role of positive emotion regulation within these associations. Moreover, we employed a methodologically diverse approach which allowed for a multi-faceted and nuanced examination of our variables of interest.

Figure 1.

The Schematic Structure of the Thesis
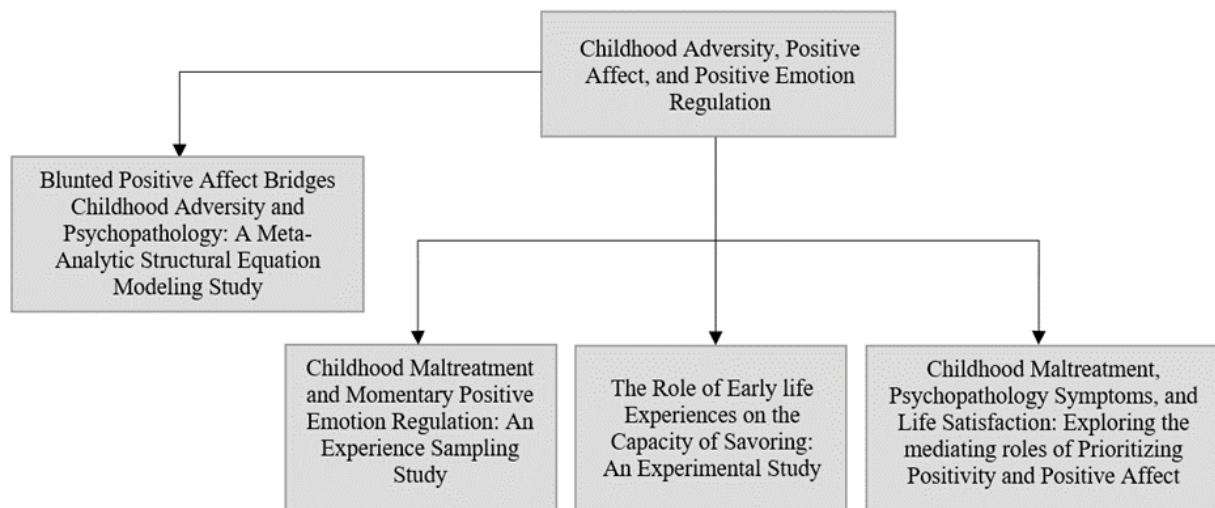
3.1. Blunted Positive Affect Bridges Childhood Adversity and Psychopathology: A Meta-Analytic Structural Equation Modeling Study[1]

3.1.1. Introduction

Adverse childhood events (ACEs) have been extensively associated with common mental disorders (Grummitt et al., 2022; Sahle et al., 2022). In recent decades, research has increasingly focused on uncovering the psychological mechanisms underlying this association (McCrory et al., 2017; McLaughlin et al., 2020), in the hope of identifying specific targets for the next generation of preventive and therapeutic efforts (Gee, 2022; Kirlic et al., 2020). The role of positive affect (PA) dysfunction in the relationship between ACEs and mental health has been relatively underexplored, and existing evidence is heterogeneous, scattered across studies that assessed PA as a secondary outcome and often focused on univariate relations between ACEs and PA or PA and psychopathology.

ACEs are thought to hinder the development of PA by exposure to environments in which threat is ubiquitous (e.g., parental abuse, domestic violence) or acute and severe (e.g., traumatic events), and opportunities for enjoyable experiences are scarce (e.g., parental neglect) (Dennison & McLaughlin, 2019). Adapting to these environments prioritizes threat detection at the expense of seeking reward, resulting in higher levels of NA and lower levels of PA. Extensive evidence indicates that enhanced NA and reduced PA are associated with psychopathology (Carl et al., 2013; Vanderlind et al., 2020), and that their effects are independent (Naragon-Gainey et al., 2018). According to the broaden-and-build theory (Fredrickson, 1998, 2013), PA is associated with beneficial effects on cognition and behavioral flexibility, promoting exploration for other positive experiences. Through these self-perpetuating cycles ('upward spirals'), PA contributes to building personal resources and fosters resilience. These beneficial effects of PA have been extensively supported (Fredrickson, 2013; Garland et al., 2010) and underscore the hypothesis that ACEs may enhance risk of psychopathology by impeding PA and their upward spirals.

Recent meta-analyses have indicated that ACEs are consistently associated with blunted PA across the life course, as reflected by behavioral expressions of PA (Lavi et al., 2019), hedonic well-being (Yeo et al., 2024), levels of gratitude (Zhu et al., 2024), and reward

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processing (Oltean, Șoflău, et al., 2022; Ruge et al., 2024). These altered PA processes are reminiscent of those found in depression (e.g., Vanderlind et al., 2020) and other mental disorders (Gilbert, 2012), but direct quantitative support for the mediator role of PA in the relation between ACEs and psychopathology is currently lacking. The present study used a a meta-analytic structural equation modeling (MASEM) (Cheung, 2015; Jak, 2015) approach to examine the direct and indirect pathways between ACEs, PA, and psychopathology.

3.1.2. Methods

3.1.2.1. Search Strategy

The protocol for this meta-analysis followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021) and was preregistered on Prospero (CRD42022308811). Systematic searches were conducted in PubMed, Web of Science, Scopus, and PsycInfo. The search combined keywords related to ACEs (e.g., childhood abuse, neglect, household dysfunction, traumatic events) and PA (e.g., positive emotion, well-being, happiness).

3.1.2.2. Selection of Studies

Two or more authors independently evaluated all studies. Studies were included if they met the following criteria: (1) conducted in humans; (2) reported empirical data; (3) assessed ACEs using self-report, other-report, or official records; and (4) assessed PA using self-report or observational measures. Assessments of happiness and well-being were included only when the instruments primarily focused on the experience of PA, ensuring conceptual alignment with our construct. Studies were excluded if they: (1) assessed only related constructs (e.g., parental characteristics such as maternal history of abuse) or typical stressful events (e.g., beginning school); (2) evaluated only physiological markers of PA (e.g., oxytocin); (3) measured constructs such as happiness or well-being that did not focus solely on hedonic emotional experience; (4) did not report baseline data in experimental studies; (5) measured positive emotions by evaluating the use of positive emotion words or term usage; (6) measured "malicious" positive emotions (e.g., joy derived from aggression); (7) included patients with psychosis; or (8) used a sample that was already included in another study in the analysis. In addition, we decided to exclude studies reporting Spearman's ρ considering that it tends to have different statistical properties compared to Pearson's r (Hunter & Schmidt, 2004).

3.1.2.3. Main Constructs and Measures

3.1.2.3.1. ACEs

The ACEs measures in this study encompassed a wide range of experiences, including childhood maltreatment and other forms of childhood adversity (e.g., household dysfunction,

community-level adversities, traumatic events). Because ACEs often co-occur (Broekhof et al., 2022; Lacey & Minnis, 2020) and to avoid violating the assumption of independence in meta-analysis (Borenstein et al., 2021), we aggregated the effect sizes for multiple ACEs when applicable.

3.1.2.3.2. Positive Affect

This category includes two major constructs: experience and behavior (Lavi et al., 2019). Physiological responses were excluded due to their loose coupling with emotional experience and behavior (Mauss et al., 2005). The experience of PA was typically assessed using scales that focused on global PA, specific discrete positive emotions (e.g., gratitude, pride), and the positive emotional components of happiness and subjective well-being. Both state and trait dimensions of PA were considered, in line with research suggesting that affect can be both situational (e.g., How do you feel today?) and dispositional (e.g., How do you feel in general?) (Watson, 1988). Behavioral manifestations of PA, such as observable facial expressions, actions, or reactions were also included, in line with previous work (Lavi et al., 2019).

3.1.2.3.3. Psychopathology

Measures of psychopathology included internalizing symptoms (e.g., anxiety, depression, PTSD) and externalizing symptoms (e.g., substance use, antisocial or aggressive behavior). These were assessed through questionnaires and clinical interviews, using self-reports or reports from others (e.g., parents or teachers).

3.1.2.4. Data Extraction

Data were independently extracted and coded by the first and third author, achieving a 93.91% inter-rater agreement. The extracted data allowed for the calculation of effect sizes for each study. We extracted Pearson's correlations between ACEs and PA, PA and psychopathology, and ACEs and psychopathology. When necessary, correlations were computed from alternative data (e.g., mean differences between groups defined by ACEs or psychopathology). In some cases, standardized regression coefficients were converted to correlations using the formula provided by (Peterson & Brown, 2005). Additional descriptive information was recorded, including sample size, participants' age, sex distribution, study design (cross-sectional or longitudinal), sample type (clinical, non-clinical, or mixed), and the country where the study was conducted.

3.1.2.5. Meta-Analysis

Direct and indirect effects of the partial mediation model, as well as potential moderator effects, were estimated using a random-effects meta-analysis through correlation-based one-stage meta-analytic structural equation modeling (OSMASEM) (Jak & Cheung, 2020). OSMASEM

integrates meta-analysis with structural equation modeling to estimate relationships among variables across multiple studies while accounting for sampling variability. In this approach, Pearson's r correlation coefficients represent the meta-analyzed effect sizes for the associations among ACEs, PA, and psychopathology. Heterogeneity, which represents the proportion of total variance attributable to between-study differences, was assessed using the I^2 statistic (Lipsey & Wilson, 2001). Model parameters were evaluated based on statistical significance and effect size estimates. Direct and indirect effects were examined using 95% likelihood-based confidence intervals, which provide robust estimates of parameter uncertainty (Jak & Cheung, 2022). The indirect effect was computed as the product of the corresponding direct effects, following common mediation analysis practices (Cheung, 2015).

Moderator variables were examined one at a time within the OSMASEM framework to explore sources of heterogeneity. The moderators tested included (1) type of ACEs (childhood maltreatment vs. other ACEs); (2) type of PA (happiness and well-being vs. positive emotions); (3) type of PA measure (behavioral vs. self-report); (4) time reference for PA measures (general vs. present vs. longer periods of time); (5) type of ACEs measure (interview vs. questionnaire); (6) age group (adults vs. children and adolescents); (7) clinical status of the sample (non-clinical vs. clinical; non-clinical vs. mixed); (8) type of psychopathology measure (self- and other-report questionnaire vs. clinical interview); (9) type of psychopathology (internalizing vs. externalizing); (10) study design (cross-sectional vs. longitudinal); and (11) quality categorized on each of the nine criteria (see Study Quality). Model parameters were regressed on each moderator variable to determine their influence on effect size variation across studies (Jak & Cheung, 2018).

Publication bias was assessed by visually inspecting funnel plot asymmetry for each correlation (ACEs↔psychopathology; ACEs↔PA; PA↔psychopathology). Duval and Tweedie's trim-and-fill method (Duval & Tweedie, 2000) was used to adjust for potential publication bias. Additionally, Egger's regression tests (1997) were performed to detect potential bias by examining the relationship between effect sizes and their standard errors.

All OSMASEM analyses were performed using the metaSEM package in R (Jak et al., 2021), which facilitates meta-analytic structural equation modeling. Missing data were handled with full information maximum likelihood (FIML), which uses all available data points to produce unbiased parameter estimates under the assumption that data are missing at random (Jak & Cheung, 2020). Publication bias and statistical outlier analyses were conducted using the "influence" command from the metafor package in R (Viechtbauer, 2010).

3.1.2.6. Study Quality

Study quality was evaluated using criteria developed by Thornberry et al. (2012) which include (1) representativeness of the sample; (2) inclusion of participants with and without a history of ACEs; (3) efforts to confirm the absence of ACEs in the control group; (4) assessment of ACEs using multiple informant reports; (5) use of validated ACEs measures; and (6) use of validated PA measures, which were considered valid if they demonstrated acceptable concurrent

and convergent validity. In addition, following Miu et al. (2022), two additional criteria related to clinical status were assessed: (7) inclusion of both non-clinical and clinical participants (i.e., those meeting established criteria for mental disorders based on a clinical interview); and (8) efforts to confirm the absence of psychopathology in the non-clinical group. Furthermore, an additional quality criterion addressed the practice of dichotomizing continuous ACEs scores, as this approach can result in a significant loss of information, reduced statistical power, and an increased risk of false-positive findings (Altman & Royston, 2006).

3.1.3. Results

3.1.3.1. Search results

The PRISMA flowchart (Fig. 1) describes the selection process. The database search yielded 6968 records. Following removal of duplicates (k = 3312), the removal of studies that were not eligible (k = 3261), and the addition of 4 records identified through citation searching, 399 articles were retained for full-text analysis. One hundred and fifteen studies were included in the analysis (total N = 305848), after we excluded reports that did not meet the inclusion criteria (k = 221) or that did not include enough data to extract the effect size, even after contacting the respective authors to obtain the necessary data (k = 63).

Figure 1

PRISMA flow diagram describing the search results and the selection process.
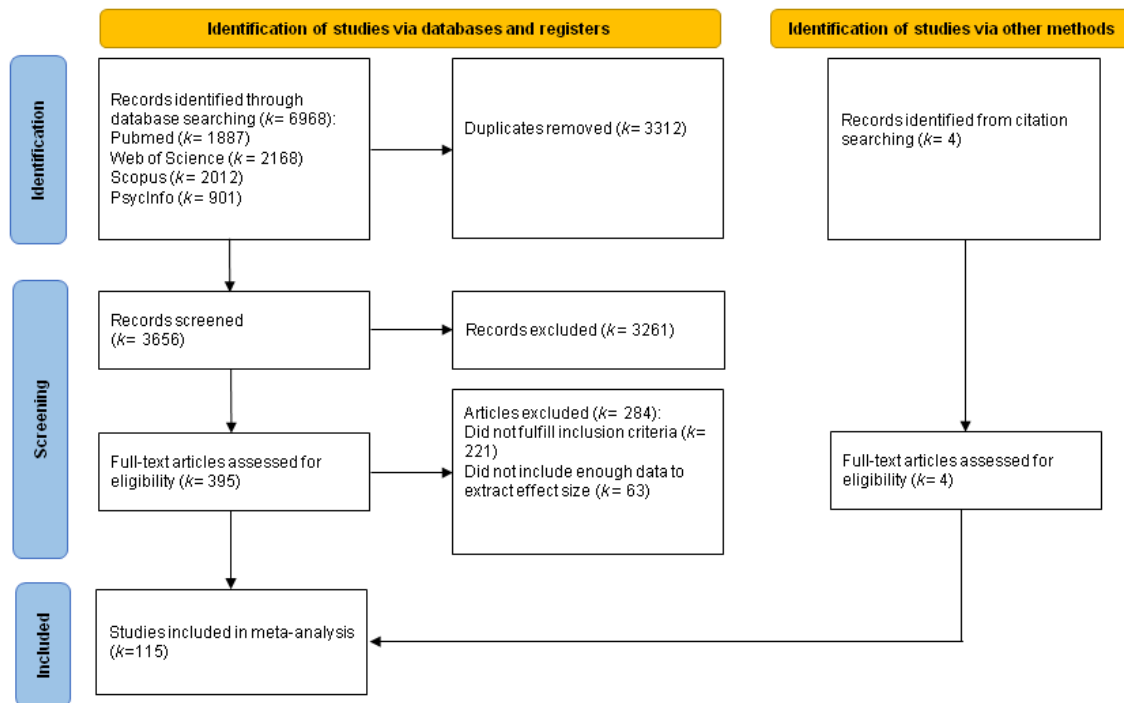
3.1.3.2. Description of included studies

One hundred and fifteen studies reported data on the relation between ACEs and PA, 57 reported data on the relation between ACEs and psychopathology, and 47 reported data on the relation between PA and psychopathology. For a description of studies, see Table 1 from the main body of the thesis. Most studies focused on global positive affect (PA; k = 86), with fewer addressing happiness/well-being (k = 14), gratitude (k = 9), joy/cheerfulness (k = 4), and pride (k = 2). PA was primarily measured through subjective experience (k = 101), with fewer using behavioral ratings (k = 14). Assessments targeted present moment PA (k = 36), general PA (k = 32), or PA over a longer timeframe (e.g., past week; k = 30), while some did not specify a timeframe (k = 16). Most studies focused on childhood maltreatment (k = 63), with the remainder examining other adverse childhood experiences (ACEs; k = 52). Adult samples were more common (k = 81) than child or adolescent samples (k = 34).

3.1.3.3. Outlier analysis

The Galbraith plot (see Supplementary Fig. 1 found in the main body of the thesis) suggested that one study 66, reporting an unusually high correlation between ACEs and PA (r = -0.99), was an outlier. This study was excluded, resulting in a modest decrease of the correlation between ACEs and PA across studies (see Supplementary Tables 1 and 2 from the main body of the thesis for average correlations and the structural model before eliminating the outlier study).

3.1.3.4. Descriptive statistics

Table 2 shows the descriptive statistics for each random-effects meta-analytic correlation, including heterogeneity coefficients, the number of studies and the number of participants. As expected, the correlation between PA and psychopathology was significant (with a medium effect size), and the correlations between ACE and psychopathology and between ACE and PA were also significant (both with small effect sizes). Heterogeneity was significant (χ^2[215] = 3797.47, p < 0.001), and high (all I^2 > 94%) for all meta-analytic correlations.

Table 2

Descriptive statistics for each correlation

Construct pair	Mean correlation	SE	τ	I^2	k	n
ACE – PA	-0.12	0.01	0.01	94.80%	114	305848
ACE – psychopathology	0.19	0.01	0.01	94.16%	57	257565
PA – psychopathology	-0.28	0.02	0.02	97.60%	47	26956

Note. Abbreviations: ACE, adverse childhood events; PA, positive affect.

3.1.3.5. Structural model

Given that the model was saturated, the model fit was perfect. Table 3 shows the estimated coefficients for the paths, which were all significant ($p < 0.001$). As expected, the indirect effect was significant: $\beta = 0.03$, 95% CI [0.02, 0.04].

Table 3

Path coefficients in the structural model

Path	Beta	SE	LLCI	ULCI
ACE – PA	-0.12	0.01	-0.14	-0.09
ACE – psychopathology	0.15	0.01	0.12	0.19
PA – psychopathology	-0.26	0.02	-0.31	-0.20

Note. Abbreviations: ACE, adverse childhood events; PA, positive affect.

3.1.3.6. Study-level moderators in the structural model

We identified multiple significant moderators: type of ACEs, type of PA measure, time reference for PA measures, type of PA measure, type of psychopathology, validity of ACEs measures, and validity of PA measures. For all these moderators, there was evidence that at least one of the paths was significantly different between the subgroups of studies being compared (for details see Table 4 from the main body of the thesis). Moderators explained between 6.7% and 51.7% of the variance of the correlations (see R^2 coefficients in Supplementary Table 3 from the main body of the thesis). The other moderators that were examined were not significant (see Supplementary Table 4 from the main body of the thesis).

3.1.3.7. Publication bias

We ran the trim-and-fill analysis and Egger's test for each set of correlations. No study was imputed in the dataset on the correlation between ACEs and PA, and the Egger's test was not significant (slope $\beta = 0.02$; 95% CI: -0.19, 0.22; $p = 0.17$). Eight studies were imputed to the left in the dataset on the correlation between ACEs and psychopathology, and Egger's test was also significant (slope $\beta = -0.44$; 95% CI: -0.78, -0.10; $p < 0.01$). The correlation decreased ($r = 0.16$; 95% CI: 0.11, 0.21) but remained significant. No study was imputed in the dataset on the correlation between PA and psychopathology, and Egger's test was not significant (slope $\beta = 0.21$; 95% CI: -0.80, 1.22; $p = 0.31$).

3.1.3.8. Study quality

Five criteria were met by most studies (see Supplementary Table 5 from the main body of the thesis): inclusion of participants with and without ACEs (95.61% of studies met this

criterion); attempts made to confirm the absence of ACEs (95.61%); putative non-clinical participants included in the sample (92.98%); use of valid measures of ACEs (85.08%); use of valid measures of PA (83.33%). In contrast, the majority of studies did not meet the other four criteria (see Supplementary Table 3 from the main body of the thesis): multiple informants used to assess ACEs (9.64% of studies met this criterion); attempts to confirm the absence of psychopathology in the non-clinical group (13.15%); not dichotomizing ACEs scores (26.32%); and use of representative samples (27.19%).

3.1.4. Discussion

This meta-analysis found consistent evidence that PA is one of the mechanisms underlying the association between ACEs and psychopathology. The finding that PA accounts for part of the association between ACEs and psychopathology aligns with the broaden-and-build theory (Fredrickson, 2013). According to this theory, blunted PA emerges as an adaptation to a scarcity of rewards in adverse environments and persists by depriving individuals of the "upward spirals" that would normally sustain PA (Garland et al., 2010). Over time, low PA—in tandem with high NA—increases vulnerability to mental disorders (Vanderlind et al., 2020), and our meta-analysis provides compelling support for this mechanism in the context of ACEs. Moreover, the pattern of correlations observed suggests that PA explains only a portion of the indirect effect.

This study also indicated that previous evidence on ACEs, PA and psychopathology is characterized by high heterogeneity. Through comprehensive moderator analyses, we identified multiple study characteristics that influenced at least one of the paths in the model, and can thus explain heterogeneity. For instance, we found that studies that focused on ACEs other than maltreatment reported more modest correlations between ACEs and psychopathology (but also higher correlations between ACEs and PA) compared to those that focused solely on maltreatment. This is in line with previous evidence that "conventional" ACEs are reliably associated with health risks, but also with suggestions that expanding the focus to other ACEs (e.g., community violence; bullying) may capture additional variance (Cronholm et al., 2015). Focusing on positive emotions rather than on broader indicators such as happiness and well-being was associated with lower correlations between ACEs and PA, yet higher correlations between ACEs and psychopathology. This pattern may reflect a trade-off between the breadth and depth of PA measures: while a more specific focus on positive emotions provides a deeper insight into certain psychological processes, it may sacrifice some of the variance needed to fully explain health outcomes (Pressman & Cohen, 2005).

Using self-report rather than behavioral measures of positive affect (PA) was linked to weaker correlations between PA and psychopathology, supporting the idea that these methods tap into distinct aspects of emotion (Mauss et al., 2005). Validated ACE measures were associated with stronger ACE-psychopathology correlations but weaker ACE-PA correlations. Other moderating factors, though less influential, included PA timeframe (present > general), participant age (children/adolescents > adults), type of psychopathology (externalizing >

internalizing), and PA measure validity (validated < non-validated). These findings highlight the need for multi-method, validated approaches in future research on ACEs, PA, and psychopathology. In terms of quality, most studies included participants with and without ACEs and used valid measures. However, limitations included the lack of multiple informants, unconfirmed clinical status in general samples and non-representative recruitment. Publication bias was also evident in ACE-psychopathology correlations, with corrected estimates showing smaller effects. Some moderator analyses were constrained by small subgroup sizes.

This study carries significant clinical implications, indicating that PA could be targeted to alleviate psychopathology in individuals with a history of ACEs. Moreover, these findings may refine risk assessment by identifying blunted PA as a potential marker of increased vulnerability to psychopathology following ACE exposure. The results also have public policy implications, suggesting that fostering PA in children and adolescents might help mitigate long-term mental health risks associated with ACEs.

3.2. Childhood Maltreatment and Momentary Positive Emotion Regulation: An Experience Sampling Study

3.2.1. Introduction

Childhood maltreatment (CM) is a prevalent and severe form of adversity, including both abuse and neglect, that occurs during childhood and adolescence or while growing up (Bernstein et al., 2003; Felitti et al., 1998). Epidemiological studies show that CM is a global issue, with worldwide prevalence rates ranging between 12.7% and 36.3%, accounting for different types of maltreatment (for a review see Stoltenborgh et al., 2015). Extensive research has consistently shown that CM is associated with increased lifelong and transdiagnostic risk for developing psychiatric disorders (e.g., Green et al., 2010). Moreover, a growing body of research has shown that CM is also associated with lower levels of psychological well-being across gender, cultural contexts and developmental stages (for a review see Yeo et al., 2024).

In light of recent literature, PA dysfunction (i.e., blunted PA) is emerging as a potential candidate mechanism pertaining to well-being and positive functioning that could underly the relationship between CM and mental health (e.g., Lavi et al., 2019; Xiang et al., 2021). The role of blunted PA in psychopathology has been well-documented (Khazanov & Ruscio, 2016; Watson & Naragon-Gainey, 2010) and presents significant relevance for psychological interventions (Craske et al., 2024).

Emotion regulation (ER), defined as the attempts to modulate the frequency and intensity of emotion (Gross, 1998), has received extensive support for its mechanistic role in the relationship between CM and psychopathology (for a review see Miu et al., 2022). However, there is a scarcity of evidence regarding the association between CM and the emotion regulation of positive emotions in particular (Goncharenko et al., 2021). In this current study we will focus specifically on two positive ER strategies: positive rumination (PR) and dampening. Although both of them are cognitive response-focused strategies, they differ in focus: PR emphasizes

positive interpretations (e.g., amplifying and prolonging positive emotions), whereas dampening centers on negative interpretations of PA (e.g., downplaying or dismissing positive emotions).

To our knowledge, only two studies have investigated the relationship between CM and both habitual PR and habitual dampening. More specifically, CM has been found to positively predict dampening, but not PR (Kiefer et al., 2023; Stone & Sylvester, 2025). Additionally, dampening mediated the relationship between CM and PTSD (Kiefer et al., 2023), and depressive symptoms (Stone & Sylvester, 2025). Although these preliminary findings are promising, further research is needed to clarify the relationship between CM and PR, and to expand our understanding on how CM influences positive ER beyond the habitual use.

3.2.1.1. Findings from Experience Sampling Method Studies

Experience sampling method (ESM) represents an alternative technique for assessing affective dysfunction and dysregulation related to psychopathology (e.g., Myin-Germeys et al., 2018). More recent research has argued that investigating variability indicators in addition to mean values is highly relevant because they can reveal unique associations with risk factors (Bann et al., 2022) and can identify patterns of instability in emotion reactivity and regulation that may contribute to psychological vulnerability (Blanke et al., 2020; Lamers et al., 2018; Nelson et al., 2020; Schoevers et al., 2021).

Accumulating research has investigated the influence of CM on momentary PA by employing ESM. Some revealed that CM is associated with lower mean levels of PA throughout the day (e.g., F. J. Infurna et al., 2015), while others failed to replicate this pattern of results (e.g.,Teicher et al., 2015). In terms of PA variability, the evidence is also mixed, with studies reporting conflicting results. For instance, a number studies have linked CM to an increased PA variability (e.g., Kuzminskaite et al., 2024), whereas some investigations have not confirmed this line of results (e.g., Ion et al., 2023).

Capitalizing on ESM, a growing body of work has investigated the spontaneous use of positive ER in daily life, revealing distinct associations with PA. Notably, while most studies have consistently demonstrated a positive link between PR and PA (e.g., Li et al., 2017), findings regarding the relationship between dampening and PA have been more mixed, with some studies failing to identify a significant association (e.g., Griffith et al., 2023). To our knowledge, only one study has explored the relationship between CM and positive momentary ER strategies (Ion et al., 2023). The authors specifically looked at savoring, and found that CM is associated with lower levels of savoring at the between-individual level, which indicated that individuals with higher levels of CM report a decreased use of savoring. However, they failed to indicate a link between CM and savoring variability. While these findings provide preliminary insights, the paucity of research concerning the relationship between CM and momentary positive ER strategies (e.g., PR, dampening) warrants further investigation.

3.2.1.2. The present study

Building on the existing literature and identified research gaps, the current study aims to investigate the associations between CM and momentary PA, on one hand, and momentary positive ER (i.e., PR and dampening) on the other hand. In line with recent studies and recommendations (e.g., Bann et al., 2022), we focused both on mean levels and variability (i.e., between- and within-participant) of our tree main outcomes (PA, PR, and dampening) in relation to CM. Additionally, we also examined the link between positive ER and PA mean and variability.

3.2.2. Methods

3.2.2.1. Participants

A total of 133 participants were recruited from the community by posting announcements on various social media platforms (e.g., Facebook, Instagram). Thirty-four participants dropped out before the ESM procedure started and eleven dropped out during it. Therefore, the final sample consisted of 88 participants (85.22% women; age M= 33, SD= 11.54, range 19-66 years). Current recommendations regarding the sample size of ESM studies, suggest a sample size of 83 participants for level 2 (between-individual) and 835 for level 1 (within-individual) (Gabriel et al., 2019). The present sample is consistent with those employed in previous ESM studies and exceeds the recommended thresholds for Level 1 (N = 4,400) and Level 2 (N = 88) inferences.

3.2.2.2. Instruments

3.2.2.2.1. Within-person level variables

Daily positive emotion was assessed using 6 items adapted from the widely used and reliable Positive and Negative Affect Schedule (i.e., joy, enthusiasm, pride) (PANAS; Watson et al., 1988). Firstly, participants chose what positive emotion/s they felt since the last beep and afterwards, they evaluated the intensity of said emotion/s on a Likert scale ranging from 1= very little to 5= extremely. They could select "another positive emotion" if none on the list applied and were asked to specify it. To ensure validity, responses naming emotions outside Russell's (1980) circumplex model were excluded. Finally, if participants did not feel any positive emotion since the last prompt, the questionnaire automatically ended and the response was rated 0 (not at all).

Daily positive emotion regulation was assessed using Responses to Positive Affect questionnaire (RPA; Feldman et al., 2008), which is in line with previous studies that employed an ESM design (Griffith et al., 2023; Vanderlind et al., 2022). The RPA is a 17-item self-report measure comprising three original subscales: self-focused (SF) positive rumination, emotion-focused (EF) positive rumination, and dampening. While the scale was initially designed to

distinguish between SF and EF positive rumination, recent findings indicate that a two-factor structure offers a more parsimonious fit (S. Nelis et al., 2016). Consequently, the current study combined the SF and EF subscales into a single global positive rumination dimension. The instructions and wording of the items were modified to fit the momentary framing of the ESM.

3.2.2.2.2. Between-person level variables

Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003) was used to assess five domains of maltreatment occurring before the age of 18 years (emotional and physical neglect along with emotional, physical, and sexual abuse). The scale demonstrated excellent reliability in the present sample (Cronbach's alpha = 0.93).

3.2.2.3. Procedure

At registration, participants provided written informed consent, and completed the CTQ. Following this, they were asked to install a mobile app called M-path (Mestdagh et al., 2023), which was used to schedule and administer the ESM questionnaire. Once the study started, the app prompted participants to complete the ESM questionnaire five times per day over 10 consecutive days, including both workdays and weekends. Notifications were sent randomly within five distinct time blocks to ensure an even distribution throughout the day.

3.2.2.4. Data Analysis

The correlation matrix at the between-level was performed in Mplus (Muthén & Muthén, 2023). The main analyses were conducted using MixWILD (Mixed-effects With Intensive Longitudinal Data; Dzubur et al., 2020), which applies a one-stage Mixed-effects Location Scale (MELS) model to simultaneously estimate the effects of a predictor on both the mean (location) and within-person variability (scale) of time-varying outcomes. Each outcome variable (i.e., PA, PR, and dampening) was modeled separately in distinct analyses, with CM included as a predictor of both the mean level and variability of the outcome. Similarly, we conducted a MELS model to assess the associations between the positive ER strategies (i.e., PR and dampening) and PA (mean and intraindividual variability). Given that PR and dampening were measured multiple times, both were modeled as time-varying predictors and decomposed into between-participant (mean levels) and within-participant (momentary fluctuations) components to estimate their distinct associations with the outcome. The random scale extension of the MELS model was specified to allow within-person variance to vary across individuals, thereby accommodating heterogeneity in PA variability over time (Nordgren et al., 2020).

3.2.3. Results

Mean, standard deviations, sample sizes, and Pearson correlation indices of the study variables are shown in Table 1. The overall completion rate for the ESM questionnaire was 83%

and the average completion rate was 85%. In 30% of the entries, participants reported that they did not feel any PA since the last notification, thus the positive emotion regulation strategies were not assessed.

Table 1

Correlation matrix at between-level

	Variable	*N*	*M*	*SD*	1	2	3	4
1.	CM	88	48.61	18.55	—			
2.	PA mean	3653	2.51	1.83	−.19	—		
3.	PR	2531	2.58	0.78	−.23*	.62**	—	
4.	Dampening	2531	1.43	0.58	.31**	−.01	−.08	—

Note. $^{**}p < .01$; $^{*}p < .05$.

The results from the MELS models that included CM as the predictor are presented in Table 2. The findings from the mean models reveal that CM significantly predicted lower levels of PR and higher levels of dampening. CM showed a marginal negative association with PA ($p = 0.075$), approaching but not reaching statistical significance. The BP variance model shows that CM predicted greater differences in dampening variability across participants. This means that higher levels of CM were associated with a greater variability in dampening at the between-participant level. The BP-variance models for PA mean and PR were not significant. According to the WP variance models, CM predicted higher within-participant variability in dampening and lower within-participant variability in PA. The WS-variance model for PR did not reach statistical significance.

Table 2

Mixed-effects Location Scale Model Estimates for CM Predicting PA, PR, and Dampening

Parameter	PA mean			PR			Dampening		
	Estimate	*SE*	*p*	Estimate	*SE*	*p*	Estimate	*SE*	*p*
Mean model									
Intercept	3.03**	.308	<.01	2.875	.187	<.01	1.071	.123	<.01
CM	-.011	.006	0.075	-.008*	.003	.021	.008**	.003	<.01
BP variance model									
Intercept	-.36	.433	.406	-.508	.488	.298	-3.44**	.425	<.01
CM	.007	.008	.392	-.009	.01	.332	.033**	.008	<.01
WP variance model									
Intercept	.964**	.069	<.01	-1.686	.076	<.01	-2.64**	.075	<.01
CM	-.003*	.001	.048	.002	.001	.13	.012**	.001	<.01

Note. BP= between-participant; WP= within-participant; SE= standard error; PR= positive rumination; PA= positive affect

$^{**}p < .01$; $^{*}p < .05$.

The results from the MELS models that included PR and dampening as predictors are shown in Table 3. PR at the between-level predicted higher mean levels of PA and lower PA variability. The pattern of results was similar in the case of PR at the within-level. Dampening only predicted higher PA variability at the between-level, while the remaining associations did not reach statistical significance.

Table 3

Mixed-Effects Location Scale Model Estimates with Random Scale Parameters for PR and Dampening Predicting PA

Parameter	PA mean			PA WP variance		
	Estimate	*SE*	*p*	Estimate	*SE*	*p*
Intercept	2.037**	.218	<.01	-.613	.332	.065
PR_BP	.648**	.068	<.01	-.373**	.105	<.01
PR_WP	.613**	.027	<.01	-.368**	.065	<.01
Dampening_BP	-.078	.095	.416	.346*	.144	.016
Dampening_WP	-.023	.035	.498	.023	.086	.793

Note. BP= between-participant; WP= within-participant; SE= standard error; PR= positive rumination; PA= positive affect

**$p < .01$; *p < .05.

3.2.4. Discussion

The current study investigated the associations between CM and tree main outcomes: momentary PA and the spontaneous use of PR and dampening. Additionally, we examined the link between the positive ER strategies and PA. A key aspect of this study was the focus on outcome variability (within- and between-participant) beyond the mean levels, which provided a greater nuance in understanding the associations of interest.

No significant association emerged between CM and lower mean levels of PA, though the finding was close to significance. This result is in line with previous studies employing ESM (e.g., Teicher et al., 2015). CM predicted reduced variability at the within-level. In other words, individuals with higher levels of CM reported more stable PA across the 10-day period compared to those with lower levels. In line with Kuzminskaite et al (2024) findings, this result may suggest that this vulnerable group presents a restrictive and blunted pattern of positive affectivity, marked by fewer emotional uplifts throughout the day and emotional rigidity (Maher et al., 2018).

Results from the MELS models revealed a significant negative association between CM and momentary PR, such that higher levels of CM were associated with lower average levels of PR across participants. In contrast to previous cross-sectional studies that failed to detect this relationship (Kiefer et al., 2023; Stone & Sylvester, 2025), the current study's use of experience

sampling methodology appears to have facilitated the detection of a negative association between CM and PR, highlighting the value of momentary assessments in capturing more accurate and ecologically valid representations of positive ER in daily life (Myin-Germeys & Kuppens, 2021). This finding is consistent with recent evidence indicating that individuals with higher levels of CM engage less in momentary savoring (Ion et al., 2023), a construct closely linked to PR (Bryant, 2021). It is worth noting, however, that Ion et al. assessed savoring using a single broad item, whereas the current study employed a more fine-grained and comprehensive assessment of the specific cognitive responses characteristic of PR. Cumulative research has linked CM to blunted responsiveness to PA (Dennison & McLaughlin, 2019) and a more pronounced negative self-concept (e.g., Melamed et al., 2024) which may, in turn, reduce individuals' capacity or motivation to engage in PR. Similar to Ion and colleagues' findings (2023) on savoring, CM did not predict PR variability (i.e., fluctuations) across time. This finding suggests that individuals exposed to early maltreatment exhibit relatively stable patterns in their reduced use of PR, which may reflect a restrictive and rigid engagement with this positive ER strategy.

Furthermore, CM predicted higher mean levels of momentary dampening. This finding is consistent with previous cross-sectional studies that revealed a similar association between CM and habitual use of dampening (Kiefer et al., 2023; Stone & Sylvester, 2025). Notably, this result suggests that the effect of CM on dampening is not limited to habitual regulatory responses but also extends to spontaneous, momentary attempts to downregulate PA, highlighting the robustness of this association. Extant research suggests that individuals with a history of CM may experience negative affect interference in response to positive events (DePierro et al., 2018). This phenomenon entails the emergence of negative emotions such as shame, anxiety, or guilt in situations that would typically elicit PA. Considering the lack of adaptive emotion regulation strategies (J. Kim & Cicchetti, 2010), these individuals may be motivated to engage in dampening to downregulate PA as a means of resolving this emotional incongruence. Additionally, CM predicted an increase in dampening variability at the between-level. In other words, individuals with a history of CM differ more widely from one another in how much they engage in dampening. This finding suggests that CM may lead to distinct patterns of dampening. The within-participant variance model indicated that participants with higher levels of CM showed greater fluctuations in their dampening responses over time. This finding may imply that these individuals engage in dampening more erratically, reflecting greater instability in their efforts to downregulate PA. The erratic use of dampening observed here may reflect maladaptive variability, where regulation is inconsistent and random (Blanke et al., 2020; Elkjær et al., 2022).

Consistent with previous studies, PR predicted higher levels of PA both at between and within-level, underscoring its role as an upregulating positive ER strategy (e.g., Griffith et al., 2023). Additionally, PR was linked to a reduced variability in PA, suggesting that individuals who engage more in PR may experience more stable and sustained positive emotions in daily life. Contrary to our expectations, dampening did not predict PA levels. This result is in line with some earlier ESM investigations which also failed to find a robust link between dampening and PA (Y. I. Li et al., 2017). However, dampening predicted increased variability in PA. This

finding may reflect a destabilizing effect of this regulation strategy, whereby attempts to suppress or minimize PA result in inconsistent or short-lived emotional experiences (Elkjær et al., 2022; Hu & Tamir, 2025). According to Grueber et al. (2013), high variability in PA may be a marker of emotion dysregulation, reflecting difficulties in sustaining or managing positive emotions effectively.

3.2.4.1. Limitations and future directions

Despite the novel findings of this study, several limitations should be taken into consideration. First, we employed a convenience sampling procedure, which restricted the sociodemographic diversity of our sample, thus future studies should aim to replicate our findings in more diverse populations to enhance generalizability. Second, we did not take into account CM severity or chronicity in our models, which could have influenced the strength or nature of the associations observed, potentially obscuring more nuanced patterns of PA dysfunction and positive emotion dysregulation across varying levels of maltreatment exposure (Kuzminskaite et al., 2024; Warmingham et al., 2023). Future studies should consider incorporating measures of CM severity and chronicity, as this may help clarify potential dose–response relationships. Third, we did not assess situational factors surrounding PA, such as the occurrence or context of positive daily events. Future research could incorporate situational factors, such as positive daily events, to better understand how context shapes the use and effectiveness of positive ER, especially among individuals with a history of CM. Fourth, we only took into account the intensity of PA in our models, without considering other aspects such as frequency or specificity (i.e., distinct positive emotions such as joy or gratitude) which may capture more nuanced positive emotional dynamics and regulation patterns (Diener, Larsen, et al., 1985). Future investigations may benefit from including a more comprehensive assessment of PA. Finally, further research could investigate potential moderating factors, such as affective symptoms and trait affectivity, to better understand the conditions under which CM influences momentary PA and momentary positive ER strategies (Carl et al., 2014; Hamilton et al., 2017).

3.2.4.2. Conclusions and Implications

In spite of these limitations, this study presents several meaningful contributions. On a methodological level, the use of ESM allowed us to examine both mean levels and variability of PA and positive ER, offering ecologically valid insights into how these affective processes unfold in daily life, particularly in relation to CM. Moreover, we included a comprehensive assessment of both PR and dampening, which allowed for a more nuanced and accurate representation of these distinct positive ER strategies. In terms of theoretical contributions, this study is the first to examine the relationships between CM and momentary PR and dampening. The study revealed significant associations between CM and lower average levels of PR, as well as higher mean levels and greater variability in dampening. These results underscore the importance of considering variability indicators when examining daily affective processes.

3.3. The Role of Early Life Experiences on the Capacity of Savoring: An Experimental Study

3.3.1. Introduction

Savoring is one of the most thoroughly researched upregulating strategies for positive affect (PA) and has been defined as "the capacity to attend to, appreciate, and enhance the positive experiences in one's life" (Bryant & Veroff, 2007 p. 9).

Extensive research has showcased the role of savoring in promoting well-being and positive functioning (J. L. Smith & Bryant, 2017). Both habitual (e.g., Bryant, 2003) and momentary (Growney et al., 2025) savoring has been associated with higher levels of PA across developmental stages. In their review, Smith et al (2014) showed that savoring related practices and interventions are effective in increasing happiness and PA.

Despite the extensive body of research, there is a paucity of studies that have investigated savoring as a regulation strategy to enhance PA within controlled laboratory settings. For instance, in the experimental study conducted by Wilson and MacNamara (2021), participants reported significantly higher ratings of PA and arousal when asked to actively savor positive or neutral images compared to when they were instructed to simply view the images. Another study by the same authors (2024) revealed that savoring not only enhances emotional responses (i.e., increased PA levels and arousal) during the initial exposure to positive images, but also generalizes to previously unseen positive stimuli. Additionally, a recent study replicated this pattern of results when participants were instructed to engage in savoring in response to mental imagery of previously viewed positive or neutral images (Jackson et al., 2024). These findings suggest that savoring can effectively amplify and sustain PA, reinforcing its potential for fostering long-term emotional well-being.

3.3.1.2. Potential moderators

A growing body of work has focused on identifying potential individual and contextual factors that may influence individuals' capacity to savor (for a review see Bryant, 2021). However, less is known about the influence of early life experiences, such as childhood maltreatment or positive childhood experiences on the capacity of savoring.

Childhood maltreatment (CM) is a prevalent and severe form of adversity, including both abuse and neglect, that occurs during childhood and adolescence or while growing up (Bernstein et al., 2003; Felitti et al., 1998). CM is linked to a greater risk for psychopathology (e.g., Keyes et al., 2012) and diminished emotional well-being (Yeo et al., 2024). Recent research suggests that the development of savoring may be influenced by parental modeling of the strategy, with evidence indicating that parents' savoring behaviors prospectively predict savoring tendencies in children and adolescents (e.g., Moran et al., 2019). Parental responses to their adolescent's PA, characterized by either savoring or dampening, are significant predictors of the child's capacity to engage in savoring (e.g., S. Nelis et al., 2019). Maltreating parents show less PA, less behaviors

congruent with PA (e.g., showing affection) and more negative affect and hostility towards their child (Lavi et al., 2021). They are also more emotionally dysregulated, which can further model maladaptive emotion regulation strategies, such as habitual dampening (Lavi et al., 2021; Morelen et al., 2016). Building on these findings, individuals with a history of CM are more likely to have lacked the emotional safety and learning opportunities necessary for developing savoring through parental modeling, compared to those without a history of CM.

On the other side of the spectrum, benevolent (or positive) childhood experiences (BCEs) refer to favorable experiences during childhood and adolescence that can lead to increased quality of life and a better mental health in adulthood (Han et al., 2023). These experiences encompass elements of emotional and social support, predictability, and positive interpersonal relationships inside and outside the home, which can foster a sense of stability, safety and positive growth in the child's life (Narayan et al., 2023). At a more granular level, BCEs have been found to predict higher levels of emotional well-being (e.g., Shaw et al., 2023) and better emotion regulation (e.g., Hanson et al., 2024). In contrast to CM, we argue that having experienced BCEs might have facilitated advantageous contexts for experiencing positive events that the child could have attended to and appreciated with the help of positive modeling from nurturing caregivers. Thus, BCEs may provide a fertile foundation for the development and practice of savoring, fostering savoring abilities that can become more established and enduring in adulthood.

Finally, another potential variable that could influence the effect of savoring is the level of trait savoring (i.e., stable tendency to engage in savoring beliefs and behaviors) that an individual has. Research suggests that while individuals with higher trait savoring tend to benefit more emotionally from spontaneous savoring in daily life (Jose et al., 2012), even those with lower trait savoring can effectively boost positive emotions when guided to savor (Rosen & LaFreniere, 2023). These findings indicate that savoring strategies may enhance PA regardless of baseline savoring tendencies.

Building on the literature presented, the current study aims to (1) test the effectiveness of savoring in increasing PA within a controlled laboratory setting, and (2) investigate the moderating role of CM, BCEs and trait savoring for the potential effect of savoring.

3.3.2. Methods

The protocol for this study was preregistered in OSF (https://osf.io/5mtxr).

3.3.2.1. Participants

A sample size estimation conducted using G*Power (Faul et al., 2007) determined that 104 participants are required to achieve adequate power ($\geq$ .80) to detect a small to moderate effect size (f = .20) with a significance level (α) of .05. A total of 123 participants were recruited from the community through announcements posted on various social media platforms (e.g., Facebook, Instagram). We excluded 14 participants who could not be physically present to

complete the laboratory task and one participant who dropped out during the experiment due to personal reasons that were not influenced by the task. The final sample consisted of 108 participants who ranged in age from 18 to 70 years (M = 26.03, SD =8.57), with women representing the majority (80.55%).

3.3.2.2. Instruments

Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003) was used to assess five domains of maltreatment occurring before the age of 18 years (emotional and physical neglect along with emotional, physical, and sexual abuse). The scale demonstrated excellent reliability in the present sample (Cronbach's alpha = 0.93).

    Benevolent childhood experiences scale (BCEs; Narayan et al., 2018) is a checklist of 10 positive childhood experiences occurring in the first 18 years of life. The items assess perceptions of relational and internal safety, predictability and positivity in daily environments, and interpersonal support. Items were rated dichotomously, with participants responding 'yes' or 'no' to each question. A greater number of affirmative responses reflects higher levels of positive childhood experiences. The scale demonstrated acceptable reliability in the present sample (Cronbach's alpha = 0.63).

    Savoring Beliefs Inventory (**SBI;** Bryant et al., 2003) was used to assess individuals' dispositional beliefs about their ability to savor positive experiences. Participants rated their agreement with 12 positively worded and 12 negatively worded statements using a 7-point Likert-type scale (1 = 'strongly disagree', 7 = 'strongly agree'), to assess their perceived ability to appreciate positive experiences. The scale demonstrated excellent reliability in the present sample (Cronbach's alpha = 0.92).

3.3.2.3. Procedure

At registration, participants provided written informed consent, and completed the sociodemographic form, CTQ, BCEs and SBI via online forms. Afterwards, each participant was scheduled for the laboratory task. A generated randomization schedule (i.e., simple/ unrestricted randomization) was conducted to evenly distribute participants into the experimental group (SAV group) or the control one (View group). The computerized picture-viewing task corresponding to each group was designed and conducted with the help of the Psychopy2 software package (Peirce et al., 2019).

3.3.2.3.1. Stimuli

Thirty positive pictures were selected from the International Affective Picture System (IAPS; Lang et al., 2005), based on their standardized valence ratings from the instruction manual. They varied in content (i.e., cute animals, scenic landscapes) and arousal level.

The Self-Assessment Manikin 9-point scales (SAM; Bradley & Lang, 1994) was used to rate valence and arousal level after each viewing. Response options ranged from 1 (extremely unhappy and extremely calm) to 9 (extremely happy and extremely aroused).

3.3.2.3.2. Savor and View task

The Savor task was a modified version of the one elaborated by Wilson and MacNamara (2021). The participants from the SAV group were instructed to amplify and prolong the positive emotions felt in response to the images presented. Before starting the task, participants were given detailed instructions on how to effectively implement the savoring strategy. Afterwards, they completed two practice trials, during which they applied the strategy on two distinct positive images and rated each image using the SAM valence and arousal scales. Following each practice trial, the experimenter asked for feedback and offered additional examples on how the strategy can be performed. The instructional scripts used were based on those from Wilson and MacNamara (2021) study. Participants from the View (control) group were asked to view the pictures as they normally would, without trying to change anything about their emotional response. We adapted the instructions used by Wooten and colleagues (2022). They were also given two practice trials to familiarize with the task.

Both tasks consisted of thirty images divided into three blocks of ten trials each. Before each block, the word SAVOR or VIEW was displayed, depending on the condition. The words appeared in white text against a black background for 3 s, after which a fixation cross was shown for 2 s, followed by the presentation of a positive image for 6 s. Subsequent to picture display, the SAM scales were presented for completion for 5 s each.

3.3.2.4. Data Analysis

Descriptive statistics and the Pearson correlation matrix between the three moderators were computed in SPSS. To examine the effect of Group (SAV vs Control) on valence and arousal a linear-mixed model (LMM) was employed due to its suitability for the study's repeated measures design, where each participant provided 30 image ratings including both valence and arousal, resulting in a hierarchical data structure (Meteyard & Davies, 2020). LMM was performed in R. (R Core Team, 2024). The model was fitted using Restricted Maximum Likelihood (REML) estimation, which provides unbiased estimates of variance components and effectively handles unbalanced data (Meteyard & Davies, 2020). To examine whether the effect of Group on valence and arousal was influenced by CM, BCEs and trait savoring respectively, three moderation analyses were conducted within the LMM to account for each moderator. Exploratory simple slope analyses were performed to examine the relationship between the moderator and the study's outcomes within each group.

3.3.3. Results

The means and standard deviations for age and the study variables are presented in Table 1. Significant correlations were observed among all moderator variables. CM was negatively correlated with both BCEs (r = -.72) and trait savoring (r = -.41), while BCEs and trait savoring were positively correlated (r = .35).

Table 1

Means and Standard Deviations for Study Variables

Study variables	Groups	M	SD
Age			
	SAV group (N = 56)	25.89	7.69
	Control group (N = 52)	26.19	9.50
CTQ		45.25	16.05
BCEs		8.31	1.73
SBI		4.75	0.98
Arousal			
	SAV group (N = 56)	6.11	2.33
	Control group (N = 52)	4.65	2.48
Valence			
	SAV group (N = 56)	7.57	1.48
	Control group (N = 52)	6.55	1.83

Note: CTQ= childhood maltreatment; BCEs= positive childhood experiences; SBI= trait savoring

The fixed effects of group on valence and arousal from the LMM analyses are reported in Table 2. The effect of group on arousal was significant, indicating that participants in the SAV group reported significantly higher arousal levels than the control group. A similar effect was found for valence, with participants in the SAV group reporting significantly higher PA levels compared to those in the control group. The LMM explained 8% of the variability in arousal scores (R^2= 0.08) and 9% of the variability in valence scores (R^2= 0.09).

Table 2

Fixed effects of Group on Study Outcomes

	Estimate	SE	t-value	d	p
Arousal	1.45*	0.28	5.13	0.60	< .01
Valence	1.02*	0.14	6.86	0.61	< .01

*p < .01; d= Cohen's d

Neither moderator (i.e., CM, BCEs, and trait savoring) significantly moderated the effect of group on arousal (see Table 3). CM significantly moderated the effect of group on valence (see Fig. 1). Similarly, BCEs significantly moderated the effect of group on valence (see Fig. 2).

Additionally, trait savoring did not moderate the effect of group on valence. Simple slope analyses revealed that BCEs significantly predicts valence in the control group (b= 0.21; SE= 0.08, p= 0.01). The rest of the simple slope analyses did not render significant results.

Table 3

The Moderating Role of CM, BCEs, and Trait Savoring

Outcome	Predictor	b	SE	t-value	p
Arousal	Constant	5.42**	0.67	8.01	< .01
	Group	0.44	0.87	0.50	0.61
	CTQ	-0.02	0.01	-1.18	0.23
	Group X CTQ	0.02	0.02	1.22	0.22
Valence	Constant	7.28**	0.34	20.96	< .01
	Group	-0.11	0.44	-0.26	0.79
	CTQ	-0.02*	< .01	-2.18	0.03
	Group X CTQ	0.03**	< .01	2.69	< .01
Arousal	Constant	4.27**	1.11	3.83	< .01
	Group	1.18	1.43	0.82	0.41
	BCEs	0.04	0.13	0.35	0.72
	Group X BCEs	0.03	0.17	0.18	0.85
Valence	Constant	4.88**	0.56	8.66	< .01
	Group	2.91**	0.72	4.01	< .01
	BCEs	0.20**	0.07	3	< .01
	Group X BCEs	-0.23**	0.09	-2.67	< .01
Arousal	Constant	4.57**	0.26	17.69	< .01
	Group	1.45**	0.36	4.03	< .01
	SBI	< .01	< .01	0.53	0.59
	Group X SBI	< .01	0.01	0.05	0.95
Valence	Constant	6.40**	0.13	48.14	< .01
	Group	1.05**	0.18	5.70	< .01
	SBI	< .01	< .01	1.85	0.06
	Group X SBI	< -.01	< .01	-0.12	0.91

Note: *CTQ*= childhood maltreatment; *BCEs*= positive childhood experiences; *SBI*= trait savoring

*p < .05; **p < .01*

Figure 1

Moderating effect of CM on Valence
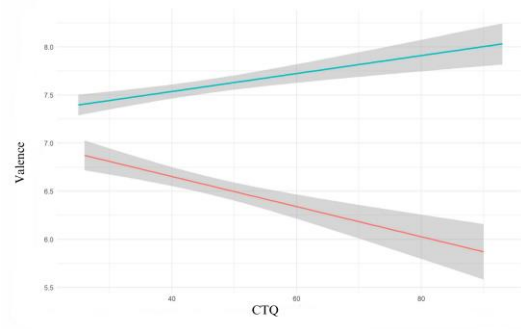
Note: *CTQ*= childhood maltreatment

Figure 2

Moderating effect of BCEs on Valence
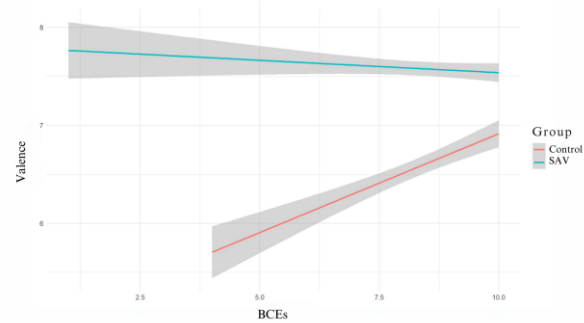
Note: BCEs= positive childhood experiences

3.3.4. Discussion

The present study sought to test the effectiveness of savoring in upregulating PA in a controlled laboratory setting. Our results showed that participants who were instructed to implement savoring in response to viewing positive images reported significantly higher levels of PA and arousal ratings, compared to those in the control group, who were instructed to simply observe the images. These findings support the notion that savoring effectively amplifies PA and arousal and are in line with prior work that employed a similar methodology (Jackson et al., 2024; Wilson & MacNamara, 2021, 2024).

Interestingly, CM positively moderated the effect of group on PA level. More specifically, for participants reporting higher levels of CM, PA levels were higher in the SAV group relative to the control one. This finding suggests that upregulating PA through savoring may be particularly beneficial for individuals with a history of CM. A potential explanation for this result could stem from Croft et al (2014) findings which showed that having overcome past adversity is linked to greater savoring in the present. This phenomenon may results from the positive hedonic contrast between past and present, which enhances perceptual awareness of positive stimuli making them more available and salient for savoring (Bryant & Smith, 2015). However, given the negative association found between CM and trait savoring which contradicts Croft and colleagues' findings, our results imply that individuals with a history of CM may not habitually savor positive experiences in their everyday lives, but they can momentarily upregulate their PA through savoring when prompted.

Moreover, a potential floor effect may have emerged for participants with a history of CM. More specifically, this vulnerable group may lack savoring beliefs and behaviors, successful savoring instances (e.g., marveling at a beautiful sunset), and positive affective experiences in general (Xiang et al., 2021), which, in turn, created room for improvement and positive change, as revealed by the higher PA levels. In a similar vein, Hurley and Kwon (2013) found that savoring had the strongest effect in predicting higher levels of PA and life satisfaction,

when coupled with fewer positive events experienced over the course of 2 weeks. They argue that savoring may be the most beneficial when people are not faced with an abundance of positive events, thus facilitating an increased attendance and appreciation of the limited number of positive events they experienced. Drawing from these findings, it appears that a 'less is more' approach may be especially advantageous for individuals with a history of CM in maximizing the benefits of savoring strategies.

In contrast, BCEs negatively moderated the effect of group on PA level. More precisely, the difference between SAV and control group decreased, as BCEs level increased. This finding suggests that individuals with higher levels of BCEs benefit less from savoring. Increased levels of BCEs may have created a ceiling effect limiting the potential for savoring to further enhance PA. In other words, individuals with greater exposure to BCEs may already experience high levels of positive emotional experiences (Samji et al., 2024) leaving less room for additional gains through savoring strategies. Moreover, this ceiling effect could reflect the idea that people with higher levels of positive early life experiences may have already internalized effective emotion regulation strategies (Hanson et al., 2024), reducing the additive benefit of savoring practices. Additionally, the results from the slope analysis reveal that BCEs significantly predicted higher levels of PA in the control group, implying that individuals with higher levels of BCEs may naturally engage in savoring when responding to positive stimuli.

Furthermore, trait savoring did not moderate the effect of group on neither PA or arousal level. More specifically, trait savoring did not influence the effectiveness of savoring in upregulating PA. These findings suggest that implementing savoring strategies in a guided context does not depend on the pre-existing level of trait savoring.

3.3.4.1. Limitations and future directions

Despite the novel findings of this study, several limitations should be taken into consideration. First, we employed a convenience sampling procedure, which restricted the sociodemographic diversity of our sample. Second, we did not take into account CM severity when examining its moderating effect between group and PA. Prior work has shown that the effectiveness of an adaptive emotion regulation strategy or a positive psychological intervention (e.g., gratitude) could vary depending on CM severity, with individuals reporting higher levels of severity tending to benefit less (Oltean, Miu, et al., 2022). Future studies should test if savoring is useful for people with increased levels of CM severity. Third, we did not measure neural correlates of savoring, and relied only on self-report ratings of the emotional response. For instance, previous studies showed that participants who engaged in savoring exhibit enhanced late positive potential amplitudes (LPP), indicating sustained attention to and amplification of positive emotional responses (Wilson & MacNamara, 2021, 2024). Further research should investigate if CM and BCEs influence LPP levels during savoring implementation. Fourth, we did not account for specific savoring experiences participants may have engaged in (e.g., cognitive reflection, experiential absorption), as the savoring instructions provided were relatively broad. Future research could benefit from distinguishing between different savoring

strategies and investigating their effectiveness in increasing PA among individuals with a history of CM. Lastly, the limited ecological validity of our experimental design constrains the extent to which our findings on savoring effectiveness can be generalized to real-world environments. Future studies could broaden the utility and practical use of savoring strategies in upregulating PA, by examining their impact in more naturalistic and diverse contexts, particularly for individuals exposed to early maltreatment.

3.3.4.2. Conclusions and Implications

In spite of these limitations, this study presents several meaningful contributions. On a methodological level, our study employed a between-subjects design, contrasting prior work that primarily used within-subject designs to investigate savoring as a positive emotion regulation strategy (e.g., Wilson & MacNamara, 2021). By replicating previous findings with a different methodological approach, our study adds valuable support to existing research. Furthermore, this is the first study to investigate the influence of two early life predictors (i.e., CM and BCEs) on savoring capacity to upregulate PA in a laboratory setting. Our results indicate that individuals with higher levels of CM tend to derive greater benefits from savoring, whereas those with lower levels of BCEs appear to benefit less. These results provide preliminary evidence for the potential benefits of incorporating savoring interventions when treating individuals exposed to early maltreatment.

3.4. Childhood Maltreatment, Psychopathology Symptoms, and Life Satisfaction: Exploring the mediating roles of Prioritizing Positivity and Positive Affect[2]

3.4.1. Introduction

Childhood maltreatment (CM) is a prevalent and severe form of adversity, including both abuse and neglect, that occurs during childhood and adolescence or while growing up (Bernstein et al., 2003; Felitti et al., 1998). Epidemiological studies show that CM is a global issue, with worldwide prevalence rates ranging between 12.7% and 36.3%, accounting for different types of maltreatment (for a review see Stoltenborgh et al., 2015). Extensive research has consistently shown that CM is associated with increased lifelong and transdiagnostic risk for developing psychiatric disorders (e.g., Jaffee, 2017). Considerable attention has been paid to the relationship between CM and depression, as a number of reviews and meta-analyses have established a

strong and robust association between the two (e.g., M. R. Infurna et al., 2016). Similarly, meta-analytic data have also confirmed that CM significantly increases the overall risk for anxiety disorders (e.g., Gardner et al., 2019). Notably, experiencing multiple types of CM increases risk of depressive and anxiety disorders to a greater degree than experiencing a single type of CM (Debowska et al., 2017; Moore et al., 2015).

While the relationship between CM and psychopathology is well documented, its associations with positive mental health indicators, such as life satisfaction, remain less explored. In a recent meta-analysis, CM was moderately associated with lower life satisfaction across developmental stages, gender, and culture (Yeo et al., 2024). This association has also been confirmed in studies employing clinical samples, regardless of symptom severity (Kolar et al., 2024; Monteleone et al., 2023).

Expanding beyond the negative consequences of CM on mental health, recent efforts have focused on uncovering the psychological mechanisms underlying the impact of CM on mental health (McCrory et al., 2017; McLaughlin et al., 2020). Several mechanisms have received extensive support, such as emotion regulation (Miu et al., 2022), and more recent work has started to examine mechanisms pertaining to positive psychology (e.g., self-compassion, gratitude) (for a review see Stevenson, 2024). However, other positive psychological factors remain largely underexplored, warranting further investigation to better understand their role as potential mechanisms in the CM-related literature. Given the limited and heterogeneous literature, prioritizing positivity and positive affect[3] may serve as candidate mechanisms explaining the link between CM and mental health.

Prioritizing positivity (PP) is a behavioral tendency in which individuals intentionally structure their daily activities and environments to facilitate the experience of naturally occurring positive emotions (Catalino et al., 2014). According to Gross's extended process model of emotion regulation (2015) and Quoidbach et al (2015) application of the model on positive emotions, PP can be considered a positive emotion regulation strategy of situation-selection driven by a hedonic emotion regulation goal.

One plausible link between CM and PP could stem from the reward processing field. A recent meta-analysis revealed that CM is associated with disruptions in reward learning (i.e., the capacity to discriminate situations that predict rewards) and reward valuation processes (i.e., the capacity to estimate the probability and benefits of potential rewards based on prior experience) (Oltean, Şoflău, et al., 2022). Thus, individuals with a history of CM might have greater difficulties in employing PP because: (1) they would find it hard to identify and select activities that can elicit positive emotions, and (2) they would struggle with anticipating and valuing the positive emotions that an activity could bring. Another link between these two variables lends support from the executive functioning field. Specifically, CM is associated with executive

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[3] From this point forward, the terms 'positive affect' and 'positive emotions' will be used interchangeably, as positive affect encompasses the experience of positive emotions, with the latter representing a more discrete form of affective experience (Russell et at, 2003).

functioning impairments, which might negatively influence the planning and problem-solving processes needed to successfully prioritize positivity in daily life without neglecting other responsibilities (Rahapsari & Levita, 2024).

Previous cross-sectional studies have shown that PP predicts lower depressive symptoms (e.g., Catalino et al., 2014). The relationship between PP and psychopathology remains an underexplored area within the current body of research, necessitating further investigation. Conversely, numerous studies have demonstrated a positive association between PP and life satisfaction among community (Russo-Netzer, 2019), student (Datu & King, 2016), and adolescent (Russo-Netzer & Shoshani, 2020) samples.

A growing body of evidence suggests that CM increases the risk of experiencing blunted PA in both childhood and adulthood. For instance, a recent meta-analysis revealed that maltreated children exhibit significantly lower levels of PA compared to non-maltreated children (Lavi et al., 2019). In studies focused on adults, CM predicts lower PA in both healthy (Arslan & Yıldırım, 2022) and clinical samples (Etter et al., 2013). Extensive findings indicate that diminished PA is a significant correlate of various forms of psychopathology (for a review see Watson & Naragon-Gainey, 2010). Aggregated evidence from review studies reveals that diminished PA is a robust predictor for both depression and anxiety, even after controlling for baseline values (Khazanov & Ruscio, 2016) and independent of NA (Naragon-Gainey et al., 2018). In contrast, individuals who experience frequent and high PA report greater life satisfaction irrespective of the absence of NA (Cohn et al., 2009). Nevertheless, a recent study has shown that lower PA has a mediating role in the relationship between CM and life satisfaction, suggesting that blunted PA might be an underlying mechanism through which CM hinders one's life satisfaction in adulthood (Xiang et al., 2021).

Extant research has indicated an association between PP and PA, supporting the claim that higher levels of PP are indeed correlated with increased PA (Catalino et al., 2014; Datu & King, 2016). Similar associations have also been found in the case of more discrete positive affective experiences (i.e., cheerfulness and gratitude) (Burzynska-Tatjewska et al., 2022; Chiesi et al., 2023). PP is also a correlate of subjective-happiness, measured as global self-evaluations of one's happiness relative to others (e.g., Machlah & Zięba, 2021). Despite this data, there are still significant gaps in the literature that could be addressed. For instance, no studies so far have investigated early life predictors of PP.

Building on the literature presented, the current study aims to (1) investigate the associations between CM, PP, PA, psychopathology symptoms, and life satisfaction, and (2) test the mediating role of PP and PA for associations of CM and two mental health indicators (i.e., psychopathology symptoms and life satisfaction).

3.4.2. Methods

3.4.2.1. Participants

A total of 268 participants were recruited from the community through announcements posted on various social media platforms (e.g., Facebook, Instagram). Participants ranged in age from 18 to 66 years (M = 31.9, SD = 10.6), with women representing the majority (88.81%). After providing informed consent, participants were asked to complete a sociodemographic form followed by measures assessing the variables of interest.

3.4.2.2. Instruments

Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003) was used to assess five domains of maltreatment occurring before the age of 18 years (emotional and physical neglect along with emotional, physical, and sexual abuse).

Prioritizing positivity scale (PPS; Catalino et al., 2014) was utilized to measure the extent to which participants prioritized implementing positive emotional experiences in their daily lives. A recent psychometric study conducted by the author of the scale recommended using a revised five-item version of the PPS, as one item demonstrated poor factor loading and conceptual divergence from the other items (Catalino & Boulton, 2021).

Positive and Negative Affect Schedule-PA subscale (PANAS-PA; Watson et al., 1988) was used to evaluate PA (e.g., joy, enthusiasm, pride).

Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1992) is a 90-item self-report questionnaire that assesses psychological distress. This instrument consists of nine subscales; however, the present study focused only on the depression and anxiety subscales. A total psychopathology score was computed by averaging the two subscales.

Satisfaction with Life Scale (SWLS; (Diener, Emmons, et al., 1985) was used to measure overall life satisfaction. The Romanian version was utilized (Stevens et al., 2012), demonstrating satisfactory reliability.

3.4.2.3. Data Analysis

All statistical analyses were performed in SPSS. In particular, serial mediation models were employed (Hayes, 2017) using bootstrapping procedures (5000 bootstrap samples) in order to test the potential mediating role of PP and PA in the relationship between CM and psychopathology, on one hand, and life satisfaction, on the other.

3.4.3. Results

3.4.3.1. Pearson Correlations

Significant correlations were observed between all the variables (see Table 1). As expected, CM was negatively correlated with PP, PA, and life satisfaction and positively

correlated with psychopathology symptoms. We also found positive associations among PP, PA, and life satisfaction.

Table 1

Correlation matrix

	Variable	*M*	*SD*	1	2	3	4	5
1.	Childhood maltreatment	43.55	16.47	—				
2.	Prioritizing positivity	6.43	1.76	−.253**	—			
3.	Positive affect	35.44	6.55	−.181**	.368**	—		
4.	Psychopathology	1.28	0.81	.301**	−.277**	−.418**	—	
5.	Life satisfaction	24.41	6.88	−.376**	.513**	.500**	−.534**	—

Note. **$p < .01$.

3.4.3.2. Mediation Models

CM significantly predicted psychopathology symptoms (b= .015, SE= .003, 95% CI [.009; .021], p< .001) and PP (b = −.027, SE= .006, 95% CI [−.040; −.015], p< .001), but it did not significantly predict PA (b= −.037, SE= .023, 95% CI [−.083; .009], p= .112). When PP and PA were included as mediators, the direct effect of CM on psychopathology remained significant but reduced (b=.011, SE=.003, 95% CI [.005; .016], p< .001), suggesting partial mediation. Together, CM and both mediators predicted 23.5% of the variance in psychopathology (F(3,264) = 26.96, p< .001).

CM significantly predicted life satisfaction (b= −.157, SE= .024, 95% CI [−.204; −.111], p< .001) and PP (b= −.027, SE= .006, 95% CI [−.040; −.015], p< .001), but did not significantly predict PA (b=−.037, SE= .023, 95% CI [−.083; .009], p= .112). When PP and PA were included as mediators, the direct effects of CM on life satisfaction remained significant but reduced (b =−.097, SE= .020, 95% CI [−.137; −.057], p< .001), suggesting partial mediation. Together, CM and both mediators accounted for 42.5% of the variance in life satisfaction (F(3,264) = 65.04, p<.001).

In terms of indirect effects (see Table 2), the results revealed that PP and PA sequentially mediated the relationships between CM and both psychopathology symptoms and life satisfaction. The total indirect effect was stronger for life satisfaction than for psychopathology, suggesting that these mediators explain a greater portion of the variance in life satisfaction compared to psychopathology symptoms. Amongst the specific pathways, the indirect effect through PP alone was significant for both outcomes but larger for life satisfaction than for psychopathology. In contrast, PA alone did not significantly mediate either relationship, indicating the role of PP as the preceding mediator in this sequence. Most notably, the serial mediation pathway (CM→PP→PA→ mental health outcomes) was significant in both models, yet again stronger for life satisfaction than for psychopathology. In other words, the impact of

CM on both outcomes is at least partially explained by its effect on PP, which subsequently influences PA.

Table 2

Summary of indirect effects (IE) in serial mediation models

Pathway	IE	SE	95% BCI[a]	
			Lower	*Upper*
Total IE[b]	.004	.001	.002	.007
CM→PP→Psychopathology	.001	.001	.0001	.003
CM→PA→Psychopathology	.002	.001	-.001	.004
CM→PP→PA→Psychopathology	.001	.001	.001	.003
Total IE	-.060	.017	-.097	-.030
CM→PP→Life satisfaction	-.035	.011	-.061	-.016
CM→PA→Life satisfaction	-.013	.009	-.032	.005
CM→PP→PA→Life satisfaction	-.012	.005	-.024	-.005

Note. [a]BCI − 95% Confidence Interval of the indirect effect derived from 5000 bootstrapped samples; [b]Total IE = Total indirect effect of the two mediator variables included in each model (PP and PA)

3.4.4. Discussion

The current study investigated the mediating role of PP and PA between CM and two mental health indicators (i.e., psychopathology symptoms and life satisfaction). As anticipated, our results showed a significant association between CM and PP. This finding suggests that alterations in the reward system associated with CM may negatively influence the selection of pleasant activities to integrate into daily life and the anticipation of the benefits (i.e., positive emotions) fostered by said activities, thereby potentially hindering the implementation of PP (Novick et al., 2018). Moreover, individuals with a history of CM are more likely to face difficulties in planning and problem solving, thus creating potential challenges for practicing PP (Letkiewicz et al., 2021). The negative correlation between CM and PA aligns with findings suggesting that CM is associated with blunted PA in adulthood (Turiano et al., 2017). Prior research has only linked PP to depressive symptoms (Machlah & Zięba, 2021). Our results indicated a negative relationship between PP and psychological distress due to both depressive and anxiety symptoms, thus adding to the literature.

Consistent with our expectations, the serial mediation model was supported by the data. More specifically, the effect of PP on psychopathology symptoms as predicted by CM is partially explained by the lower levels of PA. This finding implies that CM may hinder the capacity of PP to upregulate PA, thus increasing vulnerability to mental health issues. There is robust evidence that CM undermines the development of adaptive emotion regulation (J. Kim &

Cicchetti, 2010). Regulatory capacities may be overloaded due to early maltreatment, making it difficult to go through the PP process and consequently attenuating PA (Cloitre et al., 2005). Blunted PA has long been documented as a risk factor for developing mental health issues, especially depression and anxiety (Stanton et al., 2016). Alternatively, this pattern of results may suggest that individuals with a history of CM might not consider PP a beneficial or feasible way of fostering PA due to reward processing and executive function disruptions. As a result, they would consistently limit their opportunities to experience positive emotions in ecological settings. On one hand, they would not benefit from the *undoing* effect of PA on NA, which could lead to affective symptoms over time (Garland et al., 2010). On the other hand, they would narrow their cognitive and behavioral repertoires which would inhibit building resilience and personal resources (e.g., healthy coping strategies) that could protect against psychopathology (Tugade & Fredrickson, 2004).

According to our expectations, the data offers support for the proposed serial mediation model involving PP and PA as mediators between CM and life satisfaction. Thus, the pathway between low PP and low PA may partially explain the relationship between CM and life satisfaction. This finding adds an important contribution, suggesting that the potential disruption of the regulatory capacity of PP to enhance PA could have a detrimental effect on life satisfaction beyond psychopathology symptoms. Drawing upon the broaden-and-build theory, diminished PA resulting from insufficient prioritization of positive experiences on a daily basis may hamper the positive resource-building processes known to generate and maintain life satisfaction (Fredrickson & Joiner, 2002). In addition, positive affective experience is a relevant indicator of people's satisfaction with life, as posited by affect-as-information theory (Clore et al., 2001). Thus, if positive experiences are not prioritized, resulting in less or infrequent PA, individuals would lack positive input in regard to their life satisfaction. Indirectly, less prioritization of positive experiences could mean more negative or unfulfilling experiences that may not necessarily lead to psychopathology symptoms, but that may dimmish PA and, in turn, life satisfaction

3.4.4.1. Limitations and future directions

Despite the novel findings and explorative endeavor of this study, several limitations should be taken into consideration. First, this study utilized a cross-sectional design which precludes the establishment of causal relationships and temporal precedence. For example, prior research has suggested the existence of a reciprocal relationship between PP and PA (Datu & King, 2016). Future studies could test these reciprocal links in relation to early life predictors such as childhood adversities or benevolent childhood experiences (Narayan et al., 2018). Second, we employed a convenience sampling procedure, which restricted the sociodemographic diversity of our sample. Therefore, future studies should aim to replicate our findings in more diverse populations to enhance generalizability. Third, the current study did not include an a priori power analysis and sample size estimation for the serial mediation models tested. Given that the observed indirect effects were small, the statistical power to detect these effects may

have been limited. Future research should adopt simulation-based methods (e.g., Monte Carlo simulations) to determine appropriate sample sizes that can provide adequate statistical power for detecting indirect effects in sequential mediation models (X. Liu & Wang, 2019). Finally, we used self-report measures exclusively, which are subject to biases, such as recall inaccuracies or social desirability (e.g., Thabrew et al., 2011).

3.4.4.2. Conclusions and Implications

In spite of these limitations, this study presents several meaningful contributions. To our knowledge, this is the first study to investigate the association between CM and PP. Our findings offer preliminary support for the relationship between PP and PA as an underlying mechanism between CM and both mental health indicators. Thus, our study supports the protective role of PP for adults with a history of CM while highlighting its function as a positive emotion regulation strategy. The current study may also have practical implications, paving the way for future endeavors to test PP as an upregulating strategy for PA and thus potentially add to the existing interventions that target PA (Craske et al., 2019).

CHAPTER IV. GENERAL CONCLUSIONS AND DISCUSSIONS

The present thesis sought to investigate the association between CA and PA, with a particular emphasis on the role of positive emotion regulation in clarifying this relationship. Moreover, we aimed to investigate how these associations may contribute to psychopathology and psychological well-being.

A wealth of literature has robustly linked CA to a higher transdiagnostic and lifelong risk of developing psychopathology (e.g., Sahle et al., 2022). Recent efforts have focused on uncovering the mechanisms underlying CA and psychopathology that could inform tailored treatment (e.g., McLaughlin et al., 2020). However, few investigations have focused on mechanisms pertaining to positive psychology, such as PA.

While research on the association between CA and PA is emerging, it is marked by a scarcity of empirical findings and considerable heterogeneity across studies. Additionally, few studies have explored the mediating role of PA dysfunction (i.e., diminished PA) in the relationship between CA and psychopathology. In order to address this existent gap, we conducted a meta-analysis aimed at examining the direct and indirect associations among CA, PA, and psychopathology (Study 1). Our results indicated significant direct associations between the variables and, most importantly, supported the indirect effect of CA on psychopathology through diminished PA. This pattern of results brought a solid ground for exploring positive emotion regulation as a potential factor that could clarify and expand the links among CA, PA, and mental health.

An expanding body of research points to positive emotion dysregulation as a significant contributor to blunted PA and heightened risk for psychological disorders (Carl et al., 2013; Gilbert, 2012). More recent studies suggest that CA may also impact positive emotion regulation

(e.g., Kiefer et al., 2023). However, empirical work in this area lacks conceptual depth, with limited investigation of diverse regulation strategies and minimal attention to PA. Methodological diversity also remains scarce, with most studies relying on cross-sectional designs. To address this gap the present thesis adopted a multi-method approach to investigate the intricate associations among CA, PA, mental health, and various positive emotion regulation strategies.

Firstly, we examined the associations between childhood maltreatment (CM) and momentary PA, on the one hand, and the spontaneous use of positive rumination (PR) and dampening, on the other (Study 2). In addition, we examined the associations between the positive emotion regulation strategies and PA. The experience sampling methodology enabled us to examine both the average levels and the temporal variability of the outcomes. Our results revealed significant associations between CM and lower average levels of PR, as well as higher mean levels and greater variability in dampening. Moreover, our findings expand upon existing literature by indicating that PR is associated with reduced variability in PA, whereas dampening is linked to increased fluctuations in PA across time.

Secondly, we tested whether CM moderated the effectiveness of savoring on PA within a laboratory setting (Study 3). Additionally, we analyzed the moderating effect of two other factors: positive childhood experiences (BCEs) and trait savoring. Notably, CM positively moderated the effect of savoring on upregulating PA, suggesting that individuals exposed to early maltreatment may particularly benefit from savoring practices. In contrast, BCEs negatively moderated this effect, indicating that those with more favorable early environments may derive comparatively less benefit.

Finally, we investigated the mediating roles of prioritizing positivity and PA in the relationship between CM and two mental health indicators (i.e., psychopathology and life satisfaction) (Study 4). The results indicate that the prioritizing positivity–PA pathway partially mediates the associations between CM and both psychopathology and life satisfaction. The next section details the theoretical, methodological, and clinical implications derived from the findings of this thesis.

4.1. Theoretical and Methodological Implications

The first study consisted of a meta-analytic investigation of the direct and indirect relationships among CA, PA, and psychopathology. Our findings revealed that the link between CA and psychopathology is partially accounted for by diminished PA, lending support to the proposed mechanistic role of PA in this association. The correlation pattern indicates that the associations between CA and PA, as well as between PA and psychopathology, are weaker compared to the direct association between CA and psychopathology. This finding aligns with prior research suggesting that other factors, such as emotion dysregulation, may be more central in explaining the impact of CA on mental health (Miu et al., 2022). Moderation analyses revealed that the associations among CA, PA, and psychopathology were not uniform, but instead varied significantly as a function of several moderating factors, reflecting considerable

heterogeneity across studies. Notably, the type of CA emerged as a significant moderator of the observed relationships, with CM showing stronger associations with psychopathology, while other adverse childhood experiences excluding maltreatment (e.g., household dysfunction, community adversity) were more strongly linked to diminished PA. This finding raises an important consideration for broadening the conceptualization of early adversity to include more often overlooked experiences (e.g., discrimination, community violence), which may account for unique variance in psychological outcomes. Moreover, studies that focused specifically on more discrete positive affective experiences reported more modest correlations between CA and PA, compared to those that focused on more broader constructs, such as happiness and well-being. The pattern of results was inverse for the relationship between CA and psychopathology. In line with existing findings, CA may be more closely linked to global measures of emotional well-being (Yeo et al., 2024), while the specificity of positive affectivity may better account for variance in psychopathology (Stanton et al., 2016). The use of self-report measures, as opposed to behavioral assessments of PA, was associated with weaker correlations between PA and psychopathology. This finding aligns with the notion that self-reported and behavioral indicators of emotion are slightly related and may tap into partially distinct facets of PA (Mauss et al., 2005). Additionally, momentary PA, compared to trait PA, was associated with higher correlations between CA and psychopathology. This suggests that the greater ecological validity and reduced retrospective bias of momentary assessments may better capture PA dysfunction that contributes to the link between CA and psychopathology (Myin-Germeys et al., 2018). The use of validated measures for both CA and PA emerged as significant moderator in this meta-analysis, highlighting the importance of methodological rigor in advancing this field. Nonetheless, a key methodological contribution of this review is the use of a novel and innovative meta-analytical approach (MASEM) that utilizes structural equation modeling to estimate associations among variables of interest across multiple studies while accounting for sampling variability. By aggregating univariate effect sizes into a covariance matrix, this method allowed for the multivariate analysis of interconnected pathways, including mediation and moderation effects, across multiple studies (Jak, 2015; Jak & Cheung, 2020).

Given the paucity of research regarding the role of positive emotion regulation within the relationship between CA and PA, and by extension mental health, the empirical investigations of this thesis sought to elaborate on this gap. Therefore, in the second study, which employed an experience sampling methodology, we specifically focused on momentary PA, PR and dampening in relation to CM. Although no significant association was found between CM and mean levels of PA, CM did predict reduced within-person variability in PA, which may suggest a blunted affective profile among individuals with higher CM exposure (Kuzminskaite et al., 2024). In contrast to previous cross-sectional studies (e.g., Stone & Sylvester, 2025), we found an association between CM and lower mean levels of PR, a finding likely facilitated by the use of experience sampling methodology, which captured the spontaneous engagement with this strategy. Furthermore, CM was associated with higher average use of momentary dampening, suggesting that its impact may extend beyond habitual regulatory responses to the spontaneous

downregulation of PA. Additionally, individuals with CM exposure showed greater fluctuations in dampening over time, which may reflect maladaptive variability in emotion regulation, characterized by instability and inconsistency (Elkjær et al., 2022). PR was associated with higher mean levels of PA and a greater stability of PA over time, reinforcing its role as an adaptive emotion regulation strategy. In contrast, dampening did not predict average PA levels but was linked to greater PA variability, underscoring its potential contribution to emotion dysregulation by undermining affective stability (Grueber et al., 2013). Methodologically, this study offers two key contributions. Firstly, the use of experience sampling methodology enabled the investigation of both mean levels and variability indicators of PA and positive emotion regulation, yielding ecologically valid insights into their daily-life dynamics, particularly in relation to CM. Secondly, the inclusion of a comprehensive assessment of both PR and dampening allowed for a more fine-grained and accurate representation of these distinct positive emotion regulation strategies. All in all, this study contributes to the growing body of research on spontaneous emotion regulation in the context of CA, and is the first to document the associations between CA and momentary use of both PR and dampening.

Research examining the link between CA and savoring is scarce, with existing evidence limited to a single correlational study (Ion et al., 2023). Therefore, in the third study of this thesis, we primarily investigated whether CM moderates the effectiveness of savoring in upregulating PA within a controlled laboratory setting, and additionally explored the potential moderating roles of BCEs and trait savoring. We found that CM positively moderated the effect of group (experimental "SAV" vs control "View") on PA level. This finding suggests that strategies aimed at upregulating PA through savoring may be especially beneficial for individuals with a history of CM. Building on prior work indicating that overcoming past adversity experiences is linked to greater savoring in the present (Croft et al., 2014), our findings suggest that individuals with a history of CM may not habitually engage in savoring, in light of the negative association between CM and trait savoring we observed, but are nonetheless able to upregulate PA through savoring when guided to do so (Wooten et al., 2022, 2024). Additionally, the incremental benefits observed among individuals with CM histories may be partially attributed to a floor effect, whereby limited prior savoring and positive affective experiences (Xiang et al., 2021), created greater opportunity for emotional improvement, as revealed by the higher PA levels (Hurley & Kwon, 2013). In contrast to CM, BCEs negatively moderated the effect of savoring on PA, suggesting that individuals with higher levels of BCEs benefited less from implementing this strategy. This may reflect a ceiling effect, as those with more positive early life experiences are more likely to experience higher levels of PA (Samji et al., 2024) and may habitually use adaptive emotion regulation strategies (Hanson et al., 2024), thus reducing the additive value of savoring. The absence of a moderating effect for trait savoring suggests that the successful implementation of savoring in a guided context does not rely on individuals' dispositional tendency to savor (Rosen & LaFreniere, 2023). Methodologically, this study employed a between-subjects design, in contrast to prior research that only used within-subject approaches to examine savoring in laboratory settings (e.g., Wilson & MacNamara, 2021). To

our knowledge, this is the first study to examine the influence of two early life predictors, CM and BCEs, on the capacity of savoring to upregulate PA within a laboratory setting, offering new insights into individual differences in savoring.

Among positive emotion regulation strategies, prioritizing positivity (PP) is an emerging construct that has yet to be examined in the context of early life maltreatment. Therefore, in the fourth study of the present thesis we aimed to examine the association between CM and PP and to test the mediating role of PP and PA between CM and two mental health indicators (i.e., psychopathology symptoms and life satisfaction). As anticipated, our results revealed a significant association between CM and lower levels of PP. This finding suggests that CM-related alterations in the reward system may impair both the anticipation of positive emotional outcomes and the motivation to engage in rewarding activities, thereby potentially limiting the effective implementation of PP in everyday life (Oltean, Şoflău, et al., 2022). Furthermore, the serial mediation model involving psychopathology as the outcome, was supported. More explicitly, the pathway from CM to increased psychopathology symptoms via reduced PP was partially mediated by diminished PA. This suggests that CM may impair the ability to use PP to upregulate PA, potentially due to disruptions in adaptive emotion regulation (J. Kim & Cicchetti, 2010), reward processing (Oltean, Şoflău, et al., 2022), and executive function (Letkiewicz et al., 2021). As a result, individuals with a history of CM may have fewer opportunities to experience positive emotions, thus limiting their resilience and increasing vulnerability to mental health issues (e.g., Garland et al., 2010). Similarly, our data offered support for the proposed serial mediation model involving PP and PA as mediators between CM and life satisfaction. This finding suggests that CM may disrupt the ability to effectively engage in PP, limiting opportunities to experience PA and, in turn, undermining life satisfaction. Diminished PA, resulting from insufficient prioritization of positive experiences, may not only hinder the cultivation of psychological resources necessary for sustaining life satisfaction (Fredrickson & Joiner, 2002), but may also impair individuals' ability to evaluate their lives as satisfying (Clore et al., 2001), particularly among those with a history of CM. To our knowledge, this study is the first to examine the link between CM and PP offering preliminary support for the protective and mechanistic role of PP in the relationship between CM and mental health.

4.2. Clinical Implications

Beyond its theoretical and methodological implications, the current thesis also offers several clinical implications. To begin with, findings from the meta-analysis underscore the importance of targeting PA as part of therapeutic interventions in individuals exposed to CA. Additionally, these results can inform risk evaluation procedures by highlighting blunted PA as a vulnerability factor for the development of psychopathology in individuals with a history of CA. Findings from the moderation analyses suggest that a broader range of adversities may disrupt PA, therefore clinicians and policy makers should account for diverse forms of adversity when designing assessment tools and intervention practices. Moreover, clinicians may benefit from focusing on broader positive affective states, like happiness, in the treatment of those exposed to

CA. Nonetheless, our findings lend support to designing public policies that promote increasing PA in youth as a potential buffer against the enduring psychopathological consequences of CA.

Findings from the ESM study suggest that increasing PR and reducing dampening may serve as viable targets in clinical interventions aimed at improving mental health for individuals with CA histories. Given that both PR and dampening are cognitive-response focused strategies, cognitive reappraisal techniques would be especially useful (Weytens et al., 2014). Prior work has showed that savoring intervention are efficient in alleviating depressive and anxiety symptoms, increasing PA (e.g., Craske et al., 2019), and improving well-being (J. L. Smith & Bryant, 2017). The findings from our experimental study offer preliminary support for the beneficial value of incorporating savoring techniques for treating individuals with a history of CA. We propose that tapping into savoring processes such as thanksgiving (modulating gratitude in response to fortunate experiences) or promoting savoring strategies such as temporal comparison (framing the current experience as an improvement over past situations) could be especially helpful for individuals exposed to CA (Bryant & Veroff, 2007).

Lastly, our fourth study provides preliminary support for designing interventions that incorporate PP as a key target. Enganging in PP implies a behavioral activation component of schedulling enjoyable events (Catalino et al., 2014). Prior work has consistently shown that behavioral activation is a robust psyhcological treatment for depression (Dimidjian et al., 2011) and it also has beneficial effects for improving well-being (Mazzucchelli et al., 2010). More recent work has suggested that by tailoring behavioral activation to explicitly cultivate positive emotions and reward processing, its impact on PA can be significantly enhanced, broadening its utility beyond symptom reduction to include the promotion of emotional well-being (Craske et al., 2024). Therefore, prioritizing positivity could play a key role in this adapted approach, thereby strengthening the affective benefits of behavioral activation.

Overall, this thesis presents compelling findings that not only align with but also extend the existing literature on psychological interventions aimed at enhancing PA in vulnerable populations (Craske et al., 2024). A key strength of this thesis lies in its examination of a diverse range of positive emotion regulation strategies and the emphasis placed on their potential clinical relevance. Previous studies have suggested that combining multiple, diverse adaptive emotion regulation strategies or positive psychology interventions can amplify therapeutic outcomes (Quoidbach et al., 2010; Sin & Lyubormisky, 2009). In a similar vein, our findings support the potential benefits of an integrated, multi-strategy approach to enhancing emotional well-being in at-risk individuals.

4.3. Limitations and Future Directions

Despite the novel findings of this thesis, several limitations should be taken into consideration. Concerning the meta-analysis, the quality of the included studies presented some caveats (e.g., limited use of representative samples). Future studies should take into account these methodological limitations when designing studies within this field. Moreover, several moderator analyses were constrained by small subgroup sizes, restricting our ability to draw firm

conclusions about their significance. In the next section we will outline the general limitations of our empirical studies, along with potential directions for future research to address them.

The use of convenience sampling limited the sociodemographic diversity of the samples. Specifically, our samples predominantly comprised young and educated women. Therefore, future studies should aim to replicate our findings in more diverse populations to enhance generalizability. It is also noteworthy that we did not take into account CA severity or chronicity in our models, which could have influenced the strength or nature of the associations observed, potentially obscuring more nuanced patterns of PA dysfunction and positive emotion dysregulation across varying levels of maltreatment exposure (K. E. Smith & Pollak, 2021). Future studies should consider incorporating measures of CA severity and chronicity, as this may help clarify potential dose–response relationships. The models employed in our studies focused solely on the intensity of PA, without accounting for other dimensions such as frequency or emotional specificity, which may offer a more nuanced understanding of positive emotional dynamics and regulation patterns (Diener et al., 1985; Stanton et al., 2016). Future investigations may benefit from including a more comprehensive assessment of PA.

Moreover, the measures used in this thesis relied on self-report, which are subject to various biases; however, the inclusion of ESM and experimental designs helped to mitigate some of these limitations. Additionally, our assessment of CA relied on retrospective reporting, which research suggests may be vulnerable to recall bias and shows week agreement with prospectively collected data (Baldwin et al., 2019). Future studies should incorporate multi-method approaches, including informant reports or prospective assessments of CA to improve measurement accuracy and reduce potential biases. Although this thesis includes experimental and ecological momentary assessment designs, definitive conclusions about the temporality of the findings, particularly in relation to the effects of CA, remain limited. Future research would benefit from longitudinal designs to more accurately assess the directionality and temporal dynamics of these associations.

In spite of these limitations, the present thesis advances understanding of the relationship between CA and PA, lending support to the mechanistic role of diminished PA in the association between CA and psychopathology. Moreover, our findings highlight the role of positive emotion regulation as a significant contributor to the interplay among CA, PA, and mental health.

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