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Associations of emotion regulation strategies with mood instability in relation to invalidating childhood experiences and emotional vulnerability

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Nuotaikos svyravimai apibrėžiami kaip intensyvi ir nenuspėjama nuotaikų kaita, kuri gali vykti be priežasties arba kurią gali sukelti išoriniai faktoriai. Šis konstruktas yra esminė nuotaikos sutrikimų dalis, o žmonių be psichologinių diagnozių, didesni nuotaikų svyravimai siejami su žemesniu pasitikėjimu savimi ir tarpasmeninių santykių problemomis (Bowen et al., 2017). Šis tyrimas buvo grindžiamas biosocialiniu Linehan modeliu, kurio teorinis pagrindas išryškina esminius konstruktus nulemiančius nuotaikos svyravimus ir su jais susijusias psichologines problemas (Linehan, 1993). Tyrimo tikslas buvo įvertinti kaip šie konstruktai: emocijų reguliacijos strategijos, nepalankios vaikystės patirtys ir emocinis pažeidžiamumas yra susiję su nuotaikų svyravimais. 64 dalyviai (20 – 60 metų amžiaus, M = 25.28; SD = 4.38) užpildė afektinio temperamento (Azevedo et al., 2023), reakcijų į teigiamas emocijas (Feldman et al., 2008), tėvų reakcijų į teigiamas emocijas paauglystėje (S. Nelis et al., 2019), vaikystės emocinio pažeidžiamumo (Sauer & Baer, 2010), emocijų reguliavimo profilio (D. Nelis et al., 2011), emocijų reaguliavimo sunkumų (Victor & Klonsky, 2016) afektinio labilumo (Oliver & Simons, 2004), subjektyviai suvokto emocijų validavimo (Zielinski & Veilleux, 2018) ir nepalankių patirčių vaikystėje (Mountford et al., 2007) klausimynus. Tuomet dalyviai buvo pakviesti septynias dienas, penkis kartus per dieną, M-Path programėlėje atsakyti į momentinio vertinimo klausimus apie nuotaiką, bei kartą per dieną užpildyti vidinių būsenų klausimyną (Bauer et al., 2000). Rezultatai atskleidė, kad nepalankios vaikystės patirtys prognozuoja didesnius nuotaikos svyravimus, o emocijų nepriėmimas turi mediatoriaus rolę šiame ryšyje. Aukštesnis emocinio pažeidžiamumo lygis taip pat reikšmingai koreliavo su didesniais nuotaikos svyravimų rodikliais. Priešingai nei tikėtasi, emocinis pažeidžiamumas nebuvo statistiškai reikšmingas moderatorius ryšyje tarp nepalankių vaikystės patirčių ir nuotaikos svyravimų. Rezultatai papildė ankstesnius tyrimus, pagrindžiančius nepalankių patirčių vaikystėje, emocijų reguliacijos ir emocinio pažeidžiamumo svarbą nuotaikų svyravimų vystymuisi, pirmą kartą išsamiai tiriant šiuos ryšius Lietuvos kontekste.

Raktiniai žodžiai: *nuotaikos svyravimai, emocijų reguliacija, emocinis pažeidžiamumas, nepalankios vaikystės patirtys*

SUMMARY

Kemežytė, L. (2025). *Associations of emotion regulation strategies with mood instability in relation to invalidating childhood experiences and emotional vulnerability.* Master ‘s thesis. Vilnius: Vilnius University, 57 pages

Mood instability is defined as severe and unpredictable mood swings, which may occur without cause or due to the external factors. This construct is central to mood disorders, while in population without psychological diagnoses, higher mood instability is associated with lower self-esteem and relationship problems (Bowen et al., 2017). The current study was based on the theoretical framework of Linehan's biosocial model, which highlights the key constructs predicting development of mood instability (Linehan, 1993). The aim of the current study was to explore the interactions between emotion regulation, invalidating childhood experiences, presently perceived invalidation and emotional vulnerability and how these concepts influence the development of mood instability. Participants (N = 64, M = 25.28; SD = 4.38, from 20 to 60 years old) completed Affective Temperament (Azevedo et al., 2023), Responses to Positive Affect (Feldman et al., 2008), and Parental Responses to Adolescents Positive Affect (S. Nelis et al, 2019), The Emotional Vulnerability in Childhood (Sauer & Baer, 2010), Emotion Regulation Profile – Revised (D. Nelis et al., 2011), Difficulties in Emotion Regulation (Victor & Klonsky, 2016)Affective Lability (Oliver & Simons, 2004), Perceived Invalidation of Emotions (Zielinski & Veilleux, 2018), and Invalidating Childhood Environment (Mountford et al., 2007) questionnaires. Participants were then invited to answer momentary assessment questions about their moods on the M-Path app for seven days, five times a day, and to complete the Internal States questionnaire once per day (Bauer et al., 2000). The results revealed that invalidating childhood experiences predict greater mood instability and non-acceptance mediated this relationship. Higher levels of emotional vulnerability were also significantly correlated with higher rates of mood instability. Contrary to expectations, emotional vulnerability did not moderate the association between invalidating childhood environment and mood instability. The results add to previous research supporting the importance of invalidating childhood experiences, emotion regulation and emotional vulnerability in the development of mood instability, for the first time examining these relationships in the Lithuanian cultural context.

Key words: *mood instability, emotion regulation, emotional vulnerability, invalidating childhood environment*

THE MOST IMPORTANT DEFINITIONS

Biosocial Model – In this work, biosocial model is referred to a theoretical framework developed by Linehan (1993) explaining the development of emotion regulation problems (and by extension – development of disorders such as borderline personality disorder) by interaction between environmental influences and temperamental traits (Linehan, 1993).

Biosocialinis modelis – Šiame darbe, biosocialinis modelis apibrėžiamas pagal Linehan (1993) teoriją, kuri teigia, kad emocijų reguliavimo problemos (taip pat ir tokie sutrikimai kaip ribinis asmenybės sutrikimas) kyla dėl sąveikos tarp aplinkos ir įgimto žmogaus temperamento (Linehan, 1993).

Invalidating Childhood Environment – circumstances experienced before the age of 18 that have a detrimental impact on a child's development, both directly (e.g. abuse, neglect) and indirectly (e.g. emotional neglect and devaluation, frequent parental conflict; Hughes et al., 2017)

Nepalankios vaikystės patirtys – iki 18 metų amžiaus išgyventos patirtys, tiesiogiai (pavyzdžiui, smurtas, apleidimas) ir netiesiogiai (pavyzdžiui emocijų neatliepimas ir nuvertinimas, dažni tėvų konfliktai) žalingai veikiančios vaiko vystymąsi (Hughes et al., 2017)

Emotional Vulnerability – is defined as a temperamental trait with both higher and stronger reactivity to any emotional stimuli. This trait is crucial in the development of emotion regulation styles (Rothbart & Sheese, 2007). In the current study, affective temperament was also used to evaluate emotional vulnerability, including ***cyclothymic, dysthymic and hyperthymic temperaments***. Cyclothymic temperament is distinguished by frequent shifts between positive and negative moods, while ***hyperthymic temperament*** is defined by prevalence of mostly positive moods, higher psychomotor activity and good social relationships (Perugi, 2010). ***Dysthymic temperament*** is characterised by persistent low moods, lower self-esteem and decreased ability to experience joy (Akiskal, 1996).

Emocinis pažeidžiamumas - apibrėžiamas kaip temperamento bruožas, pasižymintis didesnėmis ir stipresnėmis reakcijomis į bet kokius emocinius stimulus. Šis bruožas yra labai svarbus emocijų reguliavimo stilių vystymuisi (Rothbart ir Sheese, 2007). Šiame tyrime emociniam pažeidžiamumui įvertinti taip pat buvo naudojami temperament rodikliai, vertintas ***ciklotiminis, distiminis ir hipertiminis temperamentas***. ***Ciklotiminis*** temperamentas pasižymi dažna teigiamų ir neigiamų nuotaikų kaita, o ***hipertiminį*** temperamentą apibūdina vyraujančios teigiamos nuotaikos, pagreitėjusi psichomotorika ir geri socialiniai santykiai (Perugi, 2010). ***Distiminiam*** temperamentui

būdinga nuolatinė prasta nuotaika, žemesnė savivertė ir sumažėjęs gebėjimas patirti džiaugsmą (Akiskal, 1996).

Emotion Regulation – a process involving all the external and internal processes responsible for monitoring, evaluating and modifying emotional reactions (Gross, 1999). Emotion regulation involves the selection and application of emotion regulation strategies, and

the strategies used for emotion regulation can be more or less adaptive.

Emocijų Reguliacija - procesas apimantis visus išorinius ir vidinius procesus, kurie atsakingi už emocinių reakcijų stebėjimą, vertinimą ir modifikavimą (Gross, 1999). Emocijų reguliavimas apima emocijų reguliavimo strategijų parinkimą ir taikymą, o strategijos, pasitelkiamos emocijų reguliacijai, gali būti labiau ar mažiau adaptyvios.

Emotion Dysregulation – is a lack of ability to effectively manage and respond to emotions, rising from lack of appropriate emotion regulation strategies (Carpenter & Trull, 2013).

Emocijų disreguliacija – nesugebėjimas efektyviai reaguoti į kylančias emocijas bei jas kontroliuoti dėl adaptyvių emocijų reguliacijos strategijų nebuvimo (Carpenter & Trull, 2013)

Mood Instability – is a term referring to rapid fluctuations in emotions, marked by intense and unpredictable shifts in mood, both triggered by external stimuli or arising without a clear reason (Patel et al., 2015). ***Trait mood instability*** describes individual tendencies to experience these fluctuations regularly and is generally considered a characteristic of the person. Meanwhile, ***state mood instability*** is defined as response to specific triggers or situations over short period of time, happening and measured in the present moment (Marwaha et al., 2014).

Nuotaikos svyravimai – tai terminas, reiškiantis dažnus emocijų svyravimus, pasižyminčius intensyvia ir nenuspėjama nuotaikų kaita, kurią gali sukelti išoriniai dirgikliai arba kuri atsiranda be aiškios priežasties (Patel ir kt., 2015). ***Nuotaikos svyravimai gali būti vertinami kaip žmogaus savybė,*** kuris apibūdina asmens polinkį pakartotinai patirti tokius svyravimus reguliariai ir yra laikomi asmens savybe. Tuo tarpu ***momentiniai nuotaikos svyravimai*** apibrėžiami kaip atsakas į konkrečius dirgiklius ar situacijas trumpame laiko periode, vykstantis ir matuojamas dabartyje (Marwaha et al., 2014).

PREFACE

Emotions help people adapt to their environment, but when they last too long or are particularly intense, emotions can also trigger maladaptive reactions (Gross & Jazaieri, 2014). According to the Hygiene institute Psychological Health Centre data, mood disorders accounted for 27% of psychological diagnoses in Lithuania between 2014 and 2023 (VSSIS, 2023). Mood instability is a key aspect of mood disorders as well as other psychopathologies such as attention deficit hyperactivity disorder or borderline personality disorder, associated with poor treatment outcomes in clinical population and lower well-being in healthy individuals (Linehan, 1993; Patel et al., 2015). Nevertheless, very little studies look into the cause or predictive factors of mood instability in Lithuania. Linehan's Biosocial model suggests that it is the interplay between inherited individual (e.g. emotional vulnerability) and environmental (e.g. parenting styles; cultural context) factors, as well as usage of maladaptive emotion regulation strategies that can explain development of higher levels of mood instability (Linehan, 1993). The current study aims to test this model with Lithuanian participants, with a goal to fill the research gap and contribute to better understanding of mood instability causes within this cultural context. Understanding the mechanisms behind mood instability holds implications both for theoretical knowledge advancement and guidance for intervention for people who struggle with mood instability.

This topic also holds a personal significance for me as I am very much aware of emotional turbulence that cyclothymic temperament and frequent mood swings bring. I have been wondering why I am the way I am half of my life. However, now I got a chance to write the whole thesis on the topic and learn more about myself, my family and mood instability – the complex construct which develops over time and is highly sensitive to environmental context. I am grateful for this opportunity and hope that what was found can add some value to what is already known about mood and why for some it keeps fluctuating a bit more than what is perceived as normal.

I would like to thank the participants (all 64 of them!) who had the patience to track their mood for the whole week and filled in a lengthy survey consisting of nine long questionnaires. I would also like to thank my friends and family who were there for me throughout the writing process while I was having many mood swings of my own. Most of all, a huge thank you to my thesis supervisor, Neringa, for her endless support during late hours, patience with all my mistakes and all the wisdom she shared.

1. INTRODUCTION

1.1. Understanding mood instability

Mood instability is understood as rapid and severe fluctuations in affect and difficulty in regulating it (Marwaha et al., 2014). Mood instability by other authors is also synonymously referred to as *mood lability*, *mood swings* and *affective lability*, therefore, these terms will be used interchangeably in this paper (Marwaha et al., 2014). Mood instability is widely studied, however, many attempts to define this construct have highlighted its divergent characteristics. Some researchers emphasise emotional reactivity in mood instability, characterized by heightened responsiveness to external events and diminished in-the-moment control (Trull et al., 2008). Others highlight the frequency, unpredictability, as well as intensity of mood shifts as the main characteristics of mood instability, supporting the idea that it is a stable personality trait (Marwaha et al., 2014). In the latter case, mood changes are measured throughout days or even weeks. Therefore, mood instability is a term lacking a consensus definition within the literature. This study aims to assess the multifaceted nature of this construct and thus both trait-like and momentary reactivity-based mood instabilities are investigated.

Mood instability is an important construct to study as it is both a widespread human experience and a key feature across a range of psychological disorders. Firstly, it is a prevalent symptom of various mental health disorders including but not limited to mood disorders such as bipolar disorder, and major depressive disorder as well as others like attention deficit hyperactivity disorder and borderline personality disorder (BPD) (Patel et al., 2015). Patel and colleagues (2015) analysed electronic health records in UK consisting of over 27,700 adults diagnosed with affective, personality or psychotic disorders and found mood instability present in 12.1% of individuals and most prevalent in ones with bipolar disorder (22.6%), personality disorder (17.8%) and Schizophrenia (15.5%). Secondly, it is predictive of poor treatment outcomes making it a transdiagnostic risk factor. Higher scores of mood instability have been associated with lower self-esteem, poor functioning and generally unhappiness in people with various mental health problems (Patel et al., 2015). Lastly, mood swings are common in the general population. Adult Psychiatric Morbidity survey 2007 (APMS) with over 7,400 entries demonstrated that 13.9% of participants had mood instability (17.6% of women). It is worth noting that in longitudinal study with healthy participants higher levels of affect lability was found to predict more interpersonal problems such as divorces, falling out with family or close friends and generally more disagreements in social relationships (Bowen et al., 2017).

All in all, mood instability is an important phenomenon to understand, due to its prevalence in healthy and clinical populations and its association with lower self-esteem and more relationship problems as well as poor psychological wellbeing and psychiatric morbidity (Sperry et al., 2020).

In order to standardise mood instability assessment several scales are commonly used in research. Affective Liability Scale is the most commonly used tool, capturing trait-level tendencies. However, in recent literature, more studies also implement ecological momentary assessment to measure moment-to-moment mood fluctuations in everyday life (Armey et al., 2015; Look et al., 2010). It has been shown that ecological momentary assessment minimizes recall bias and increases ecological validity. It is particularly relevant in studies investigating mood instability as emotional experience, in which trait-level affect assessments tend to be affected by retrospective bias (Ebner-Priemer & Trull, 2009). Moreover, ecological momentary assessment captures mood in real time, thus can better reflect person's short-lived emotional shifts. Ecological momentary assessment complements traditional trait-based assessments through daily evaluation; thus, both of these methods are applied in the current study.

1.2. Understanding emotion regulation and its implications

Emotion regulation refers to the processes and behaviours through which a person attempts to influence how they exhibit or experience their emotions (Gross et al., 1998). In Lithuanian literature, the emotion regulation term is widely used as "*Emocijų reguliacija*" and describes a process, which can happen consciously, willingly or automatically and consists of emotion understanding and control as well as increasing positive and decreasing the negative affect (Gervinskaitė-Paulaitienė et al., 2017; Gross et al., 2006). Emotion regulation skills are crucial for mental health and general well-being as they affect social relationships, work performance and even physical health (Menefee et al., 2022). Notably, emotion dysregulation refers to the experience and expression of emotions that is not helpful or even interfere with the ability to engage in goal-focused actions (Beauchaine, 2015). Additionally, poor emotion regulation skills are associated with both the development of and worse treatment outcomes of a variety of psychological disorders (Dvir et al., 2014). For example, individuals suffering from depression struggle to regulate negative affect and report inability to feel pleasure to positive affect reporting feelings of numbness instead (Vanderlind et al., 2020). Overall, researchers associate successful use of emotion regulation with increased wellbeing and improved relationships, while difficulties in emotion regulation are associated with mental health problems (Aldao et al., 2010).

Emotion regulation can also be understood through the use of regulation strategies which can be adaptive and maladaptive (Aldao et al., 2010; Schäfer et al., 2017). Adaptive emotion regulation

strategies are defined as those with negative associations with mental illness and positive relations to well-being. Meanwhile, maladaptive strategies are defined as those associated with psychological disorders. The most popular theory of emotion regulation proposing classification of its strategies is Gross and John's (2003) process model. It defines emotion regulation as a timeline-based process, starting with evaluation of emotional cues. It also groups the strategies into two major types – antecedent-focused and response-focused. Antecedent-focused strategies are generally more adaptive and begin before the emotion is fully developed (Gross & John, 2003). An example of Antecedent-focused strategy could be cognitive reappraisal, which is the interpretation of potential emotion-eliciting situations in non-emotional terms to change the emotional reaction to the situation. Cognitive reappraisal is considered to be an adaptive emotion regulation strategy and is linked to higher well-being and better interpersonal relationships. Meanwhile, Response focused strategies are usually used after emotion is fully pronounced and modifies outward emotional responses. Example of such strategy could be emotion suppression which is interpreted as the control of the expression of emotions, when a person holds experienced emotions inside and does not vent them. It is considered to be less adaptive and is associated with increased stress and lower well-being (Butler et al., 2003; Verzeletti et al., 2016). The main notions of Gross Process model is that timing of emotion regulation matters, and antecedent-focused strategies tend to be more effective.

People mostly regulate their emotions during two types of situations: (1) when they interfere with the goal achievement or when something is important to a person and (2) when individual's emotions mismatch with their social groups' emotional reactions (Gross et al., 2006; D. Nelis et al., 2011). In daily life, people are most commonly down-regulating negative emotions, although regulating (down-regulating, maintaining and up-regulating) positive emotions is also common (Gross et al., 2006). For example, a person might attempt to down-regulate positive emotions such as romantic excitement if they develop feelings for someone else while already in a committed relationship. Maintaining positive emotions occurs, when we want to prolong it, for example sharing wedding pictures when the celebration has passed. Up-regulating positive emotions is useful when something is not meeting our expectations, for example, focusing on positives when we are trying to enjoy a vacation which is failing to meet our expectations (Mikolajczak & Luminet, 2009). The broaden-and-build theory of positive emotions, developed by B. Fredrickson, proposes that positive emotions are crucial for function, psychological resilience and healthy development, highlighting that the regulation of the positive affect is as important to research as the emotion regulation of the negative affect (Fredrickson, 2004). Building on Fredrickson's and Gross's theories, Nelis and colleagues (2011) developed the Emotion Regulation Profile (ERP) assessment tool, which distinguishes 16 strategies aimed at both enhancing and down-regulating emotional responses. Notably, the authors emphasize the regulation of positive affect, not just the reduction or control of

negative mood. Such approach takes the adaptive role that enhancing or sustaining positive affect plays in psychological well-being into consideration when assessing specific emotion regulation strategies. To sum up, these theoretical models provide the foundation for understanding how individuals in different emotional environments develop distinct patterns of emotion regulation, which the current research study aims to explore further in the Lithuanian cultural context. Provided that poor emotion regulation skills can lead to emotion fluctuations, intense and difficult to manage, emotion dysregulation could also be associated with the development of mood instability.

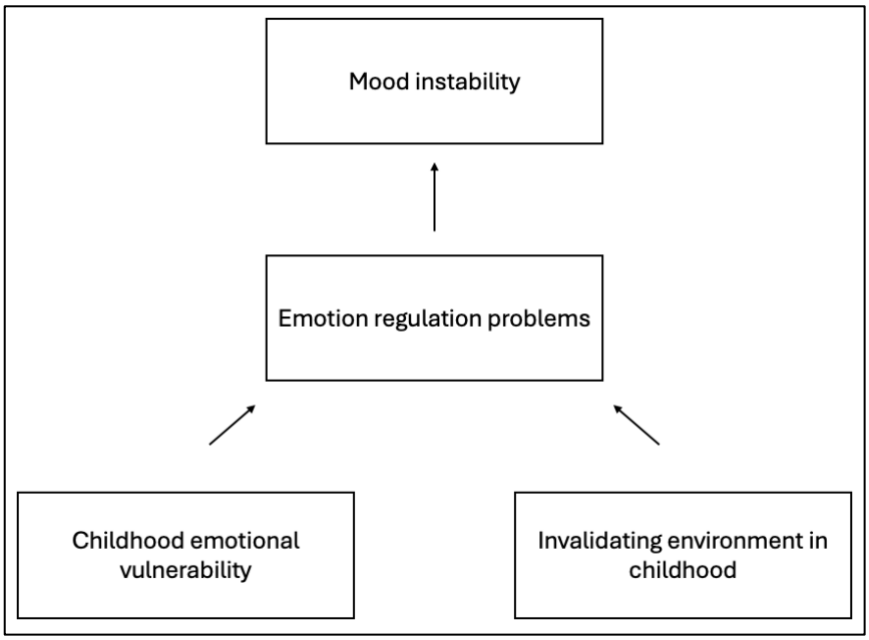
1.3. Biosocial model – effects of childhood environment and emotional vulnerability

The biosocial framework for the development of BPD describes the role of emotion regulation in the clinical setting (Gratz & Roemer, 2004; Linehan, 1993). The BPD is a mental health disorder characterised by difficulties in emotion regulation, mood instability and self-identity as well as behaviour and interpersonal problems (APA, 2023). The Biosocial model was first established by Marsha Linehan, who suggested that BPD *mainly* results from difficulties in emotion regulation (Crowell et al., 2009). According to Linehan's model, the struggle to regulate emotions in BPD arises from a combination of childhood environmental circumstances and inherited biological factors such as emotional vulnerability and temperamental impulsivity (see Figure 1). The crucial hypothesis of this perspective is that people with BPD did not learn how to regulate their emotions while growing up which leads to dysfunctional practises such as self-harm (i.e. "*my parent is only nice to me when I self-harm or am in pain*"). It also suggests that individuals who are more emotionally vulnerable by nature, are reacting more sensitively to invalidating experiences and thus develop affect difficulties when growing up, including emotion dysregulation and mood instability. While originally developed as theoretical framework for BPD, biosocial model has been shown to be a helpful template when exploring other psychological difficulties that include emotional problems also including mood and anxiety disorders (Gill et al., 2018). Thus, this model underlines the significance of early environment and parental validation for individual emotional development and suggests that invalidating experiences can reinforce the maladaptive emotion regulation strategies used later in life.

To fully comprehend the basis of Biosocial model it is important to understand what the emotional vulnerability and invalidating childhood experience are. The invalidating environment is defined as developmental circumstances in which child's experiences and needs are not recognised, punished or dismissed (Lee et al., 2023). Invalidating environment may vary in intensity ranging from situations in which child's emotional needs are not receiving appropriate reactions (for example, punishment for expressing anger) to extreme cases involving physical or sexual abuse. (Linehan, 1993; D. Nelis et al., 2011). Meanwhile, the emotional vulnerability trait is defined as a person's

inherited tendency to experience more negative emotions and to be more emotionally reactive (Lee et al., 2023). Emotional vulnerability can manifest in difficulties in three key areas: increased sensitivity to emotional triggers, overreactions and taking longer than usual to return to baseline emotion (Linehan, 1993). The Biosocial model proposes that emotional vulnerable children are more reactive to invalidating experiences and therefore develop emotion regulation difficulties and later in life – traits associated with BPD.

1 Figure. *Visual representation of Biosocial model adapted from Gill and colleagues (2018). Emotional vulnerability and invalidation experienced in early age result in emotion regulation problems, which in turn cause development of traits common in individuals diagnosed with borderline personality disorder, which include mood instability, explored in the current study.*



Building on the theoretical framework of the Biosocial model, recent studies investigated its core aspects by examining how emotional vulnerability and invalidating childhood experiences interact to influence the development of BPD traits. For example, a recent longitudinal study attempted to confirm the Biosocial model for BPD and investigated how emotional vulnerabilities (including impulsivity specifically) and parental invalidation contribute to emotion dysregulation and development of BPD and how these factors affect each other reciprocally over time (Lee et al., 2023). 332 teenagers (between 12 and 17 years old) were recruited in Singapore and completed self-reported measures for impulsivity, emotional sensitivity, parental invalidation, emotion regulation difficulties and BPD traits during three time points six months apart. It was found that all three predictors were significant when predicting increases in emotion dysregulation, while only impulsivity and emotional vulnerability predicted BPD symptoms. Authors also demonstrated bidirectional connection between emotional vulnerability and parental invalidation, meaning that higher vulnerability predicted

teenagers perceiving their parents as less validating, as well as more invalidating parent behaviours caused increase in emotional vulnerability in their children. This is important as it supports the idea within biosocial model suggesting that child traits and parental behaviours interact over time. Additionally, Lee and colleagues (2023) recruited teenagers from general population (i.e., without any prior clinical diagnoses). Considering this, it could be concluded that emotional vulnerability and childhood invalidating environment may contribute to general emotion regulation difficulties later in life, even in absence of BPD diagnosis. Finally, their findings also provided grounds for further investigations of other and more specific constructs besides parental invalidation, which can contribute to development of BPD symptoms, such as invalidation experiences later in life or separate emotional vulnerability factors (Lee et al., 2023).

Moreover, in their meta-analysis, Lee and colleagues (2022) selected 21 studies investigating association between parental invalidation and BPD. The connection between parental invalidation and BPD symptoms was demonstrated to have small to moderate associations in multiple studies (Lee et al., 2022). It was also noted that maternal invalidation has a stronger effect on BPD symptoms. The findings supported biosocial model framework and highlighted the need to further investigate the difference between paternal and maternal invalidation effects. Importantly, there is a research gap in Lithuania regarding the application of biosocial model for emotion dysregulation or mood instability. While previous research supports this model, exploring how emotional vulnerability and childhood invalidation contribute to emotion dysregulation and mood instability in broader populations is an important next step in testing and expanding the biosocial framework and the current study aims to contribute to filling this gap in research.

1.4. Interactions between mood instability, emotion regulation, experienced invalidation and emotional vulnerability

The constructs described above have been explored beyond the context of biosocial model and it is important to summarise what is already known about the associations between them. For example, increasing amount of research suggests that the interaction of emotional vulnerability and invalidating environments significantly affects the development of both emotion dysregulation and mood instability. Clinical diagnoses such as depression and anxiety were also previously associated with invalidating childhood experiences (Krause et al., 2003). What is more, in the study by Heleniak and colleagues, invalidating environment in childhood, specifically child maltreatment was associated with problems in emotion regulation (Eisenberg et al., 2010; Heleniak et al., 2016). Emotion regulation was demonstrated to be a mediator between childhood maltreatment and a range of psychological problems in teenagers, namely internalizing psychopathology and increased

emotional reactivity (which is notably a crucial feature of mood instability as well). The study highlights the importance of targeting emotion regulation skills to help reduce or prevent mental health symptoms in maltreated youth.

Furthermore, childhood invalidation has also been associated with higher emotional vulnerability in *adulthood* and stronger BPD symptoms (i.e., affective instability, self-harm, negative relationships and identity problems) in Asian study (Keng & Soh, 2018). Several studies support this association. Janiri and colleagues found that emotional vulnerability, particularly cyclothymic temperament, can predict emotion dysregulation, while both independently can predict increased vulnerability to suicidal thoughts during the lifetime (Janiri et al., 2021). Similarly, in another study, emotion vulnerability has been associated with emotion dysregulation, supporting the idea that innate emotional sensitivity can contribute to long-term difficulties in managing affect (Eisenberg et al., 2010). Moreover, a pilot research study with bipolar disorder patients revealed that increased emotional reactivity positively correlates with hypomanic symptoms and use of less adaptive emotion regulation strategies (Hanć, 2019). This demonstrates that emotional vulnerability and hypomanic tendencies may contribute to mood instability, however, the findings cannot be generalised due to small sample (N=22) and heterogeneity in different diagnoses of the participants, including both bipolar I and II presentations. Interestingly, researchers also found that maternal invalidation had a bigger effect on BPD-like symptoms than paternal, again indicating that there might be a different effect of family and specific parent invalidation (Keng & Soh, 2018). Considering such findings, it could be hypothesised that higher temperamental emotional vulnerability could lead to more intense emotional experiences and possibly affect lability.

Moreover, recent research has begun to explore how emotional invalidation relates to mood instability depending on its context and timeframe. For example, a recent study, which applied ecological momentary assessment method, demonstrated that current perceived emotional invalidation was related to lower momentary positive and heightened negative mood in daily life (Zielinski et al., 2023). The researchers recruited 86 undergraduate students who responded to 7 prompts per day which assessed momentary affect and social context. The findings suggest that perception of being emotionally invalidated can undermine emotional well-being and contribute to real-time mood instability, emphasising the role perceived validation has on everyday emotional experiences. These results emphasize the relevance of perceived validation in everyday emotional functioning during the adulthood**,** expanding the focus beyond early childhood experiences. However, this study concentrated on students which resulted in limited diversity both in age and in social groups, thus, the generalizability of these results is limited, and further investigation is needed. In contrast, another study focused on the trait-like mood instability and its connection to invalidating environment experienced in childhood (Teicher et al., 2015). The researchers suggested that mood

instability as a trait develops early in life. Teicher and colleagues (2015) investigated whether childhood maltreatment in 60 young individuals (between age of 18 and 25) was associated with positive or negative mood dysregulation. Authors did not screen for any psychological disorders. It was found that while differences in mood instability were not statistically different in participants with maltreatment history, positive moods were more unstable and with more disrupted rhythms, while negative moods were shown to be more persistent. This research supports the idea that maltreatment in childhood might affect the traits like affective lability rather than state-dependant mood instability feature, however, more research is needed to support this hypothesis. Taken both these studies together, it can be hypothesised that both early-life invalidation and ongoing perceived invalidation during the adulthood may have a unique and potentially compounding influence on mood instability. Importantly, it might affect the trait-like and momentary mood instability differently, which requires further investigation.

Empirical evidence stipulates that emotion regulation could potentially mediate the relationship between invalidating environment and intensity of mood instability within an individual. For example, in the sample of Syrian refugees it was demonstrated that emotion regulation acts as a mediator between childhood trauma and psychological symptoms later in life (Demir et al., 2020). Moreover, supporting the framework of biosocial model, Kanj and colleagues (2023) revealed that the relationship between higher emotional abuse during childhood and more pronounced BPD traits such as affective lability and impulsivity are significantly mediated by emotion regulation difficulties. Authors further concluded that the significant indirect effect of emotion regulation difficulties may contribute to the intensity of BPD symptoms, as experienced emotional abuse impacts development of successful strategy use (Kanj et al., 2023). The findings contribute to evidence that emotion regulation might be a crucial mechanism through which early life experiences affect development of BPD symptoms, including mood instability. Interestingly, contradicting evidence was also found. Another study, investigating the relationship between childhood invalidation and BPD symptoms, found that emotional dysregulation does not function as a mediator (Gill et al., 2018). The authors also tested whether the biosocial model is unique to BPD traits or could potentially be used for wider range of disorders with emotional dysregulation as a key factor. The results revealed that both emotional dysregulation and vulnerability has a significant association with chronic worry as well as BPD traits. Such findings point to possible limitations of the biosocial model and suggest that role of emotion regulation is more complex and should be explored more extensively. Nevertheless, the findings of all discussed studies suggest that mechanisms of emotion regulation can play a key role in the developmental trajectory of individual's emotional functioning after growing up in invalidating circumstances. The current study aimed to investigate this connection in the Lithuanian cultural context, recruiting participants from a wide age range and different backgrounds.

1.5. Existing Lithuanian studies

Based on Public Health Monitoring Information System of Lithuania (In Lithuanian: "Visuomenės sveikatos stebėsenos informacinė sistema"), in 2023 there were 2 363.1 cases of mood disorders per 100,000 of citizens (VSSIS, 2023). Therefore, mood disorders are a significant problem in Lithuania. Previously discussed evidence highlighted that mood instability, which is a key aspect of mood disorders is also prevalent in healthy population and correlates with decreased well-being and low self-esteem (Patel et al., 2015). While literature focusing on biosocial model specifically in Lithuania is limited, some studies did explore how the invalidating environment and emotion regulation is related to the development of mood instability separately. For example, R. Marcinkevičiūtė and M. Marcinkevičius (2024) explored how adverse childhood experiences, such as domestic violence, sexual harassment or traumatic accidents are related to psychopathology in adulthood. Notably, researchers found that 80% of their respondents (N = 97; 87 women and 13 men) reported at least one adverse childhood experience, emotional abuse being the most prevalent. In comparison, the global average calculated based on 65 studies focusing on adverse experiences in childhood is 68% (Madigan et al., 2025). The study findings revealed that number of adverse experiences significantly correlated with mental health problems in the adulthood, particularly mood and anxiety disorders. Furthermore, a study conducted in Lithuania investigated how child abuse results in emotion regulation problems in early teenage years (Gervinskaitė-Paulaitienė et al., 2017b). Out of 565 participating teenagers between 12 and 14 years old, almost 24% experienced physical abuse, which correlated with weaker emotion regulation skills – they were more likely to suppress their emotions and were less likely to rethink the situation to regulate their emotions. Interestingly, physical abuse experiences and poor emotion control were also associated with more psychosomatic symptoms, which further demonstrates how invalidating environment results in emotional and psychological difficulties. These studies highlight that adverse childhood experiences are prevalent in Lithuania, which reflects the importance of studying them and their implications throughout the lifetime. Considering emotional abuse was found to be the most prevalent adverse childhood experience in the Lithuanian sample, it is important to investigate how less direct invalidating experiences affect emotional and affect development (Marcinkevičiūtė & Marcinkevičius, 2024).

Finally, while there were no research studies found which would explore direct relationship between emotion regulation and mood disorders, recent study in Lithuania also found higher levels of anxiety in medical students to be associated with higher usage of maladaptive emotion regulation strategies, highlighting the significant effect emotion regulation has on the mental health (Žukaitė & Antinienė, 2022). There were no Lithuanian studies involving specifically emotional invalidation and

its relationship to mood instability. Mood instability is a key construct in mood disorders and significantly affects individual's well-being (even without a clinical diagnosis), thus there is a clear gap in literature studying its origins in the Lithuanian population.

1.6. The current project aims and hypotheses

Despite growing evidence for associations between mood instability, emotion regulation, emotion vulnerability and invalidating experiences, this has never been explored in a Lithuanian population with a wide age range. The importance of successful emotion regulation strategies for both general well-being and positive treatment trajectories in different psychological disorders is clearly reflected in the literature. However, the interaction between early environmental factors, temperamental traits and the emotion regulation in daily life remains under researched. Thus, the aim of this study was to evaluate these relationships in a diverse, non-clinical Lithuanian sample.

The goal of the study: To assess the interactions between emotion regulation strategies and mood instability in relation to invalidating experiences and emotional vulnerability.

Hypotheses:

H1. Greater mood instability will have a positive correlation with invalidating experiences both in the past and in the present.

H2. The relationship between mood instability and invalidating experiences in H1 will be mediated by the emotional regulation strategies in use in the adulthood. Invalidating environment will lead to emotional dysregulation and validating environment to more adaptive emotion regulation use which in turn will result in lower and higher mood stability respectively.

H3. Emotional vulnerability will result in higher mood instability.

H4. Emotional vulnerability will stand as a moderator between invalidating environment and mood instability. Higher emotional vulnerability and invalidating environment will predict higher mood instability.

2. METHODS

The current study was part of a research project of Psychology PhD student Xici Wan from the University of Exeter in the United Kingdom. This research project is a replication, ***conducted in the Lithuanian language***. The ethics permission for the study was obtained from Faculty of Philosophy, Vilnius University Committee on research ethics in psychology, February 25th, 2025. The data was collected ***online***, using the free to use survey tool Qualtrics and the M-Path app for ecological momentary assessment questions (Mestdagh et al., 2023).

2.1. Participants

In the current research paper, data from 64 participants from 20 to 60 years old (M (age) = 29.1) were analysed out of which 23 were men (M (age) = 25.8 (SD = 4.38)), 40 women (M (age) = 31.8 (SD = 12)) and one person selected "other" as their gender (25 years old). For the analyses with ecological momentary assessment variables, data from 60 participants were analysed, as 4 dropped out after completing the first part of the study. The recruitment process is represented in Figure 2. For this study, the inclusion criteria were: (1) being of age 18 or older, (2) availability to participate in the full study, (3) fluency in Lithuanian language, and (4) scoring below the moderate range on the DAS-21 depression subscale due to vulnerable nature of questions about childhood experiences. Participants were recruited using volunteer sampling – the invite to join the study was sent out to Vilnius University students via email as well as through convenience sampling by sharing the invitation in author's personal social media pages (see the invite in **Appendix**). All participants provided consent to use their data for academic purposes after being presented the information sheet in online survey tool Qualtrics (see the information sheet in **Appendix**).

2.2. Materials

Double translations from English to Lithuanian were performed for all questionnaires.

For the selection process, *Depression, Anxiety and Stress* scales (DASS-21) were used (Lovibond & Lovibond, 1995). DASS-21 was designed to evaluate depression, anxiety and stress states both in clinical and research settings. The 21 statements are rated on a 4-point Likert scale (from 0 = "*Did not apply to me at all*" to 3 = "*Applied to me very much or most of the time*"). All three subscales consist of seven items and have demonstrated good construct validity and internal consistency (Lovibond & Lovibond, 1995; Norton, 2007). In the current sample, Cronbach's alpha was calculated and the internal consistency for all subscales was good: depression $\alpha = 0.79$; anxiety $\alpha = 0.83$, stress $\alpha = 0.84$.

Emotional vulnerability Emotional vulnerability was measured with two questionnaires. One of the measurements used for emotional vulnerability was the *Affective Temperament Questionnaire* (ATQ, Azevedo et al., 2023)). ATQ was designed to assess variations in affective temperaments. The English version of ATQ has demonstrated good internal consistency and is a validated self-report instrument to investigate affective temperament (Light et al., 2009). The measure uses three-factor model including hyperthymic, cyclothymic and dysthymic temperaments. The questionnaire consists of 20 phrases that participants evaluated as descriptive of their usual self on a three-point scale (0 – "not at all"; 1 – "somewhat; 3 – "very much so"). For example, participants are asked whether they would describe themselves as "*Over-involved and meddlesome*" or "*Alternating between low confidence and over confidence*". The internal consistency for hyperthymic scale revealed moderate reliability ($\alpha = 0.68$), for cyclothymic – low internal consistency ($\alpha = 0.53$); Dysthymic temperament subscale was demonstrated to have moderate internal consistency ($\alpha = 0.63$). While both cyclothymic and dysthymic subscales were still used, as these constructs were essential for the current study, the results involving them are interpreted with caution.

The Emotional Vulnerability in Childhood Scale (EV-CHILD; Sauer & Baer, 2010) was used to assess emotional vulnerability during childhood. This measure was designed to reflect emotional sensitivity during childhood as well as reactivity. The scale consists of 22 statements about what one's emotions might been like during childhood (e.g., "*If things didn't go my way, I got quite distressed*" or "*When I felt guilty, this emotion was quite strong* "), each evaluated with a 6-point Likert scale (from "never" to "always"). Scale was shown to have high internal consistency and high correlations with borderline personality disorder. For the Lithuanian sample in the current study, EV – CHILD showed very good internal consistency (Cronbach's $\alpha = 0.94$).

Emotion Regulation. Emotional regulation was measured with three questionnaires. *The Emotion Regulation Profile-Revised* (ERP-R) scale was created to assess the individual differences in emotion regulation strategies (D. Nelis et al., 2011). It is used to measure two distinctive types of emotion regulation: negative emotion down-regulating and up-regulating positive emotions and includes 16 specific emotion regulation strategies (8 maladaptive and 8 adaptive). The measurement consists of 16 scenarios that describe real life-like emotion-evoking situations such as going through a breakup (negative) or discovering a picturesque nature location (positive). The participant is then asked to select one out of eight possible reactions that are the most resemblant to how they would react if such a situation happened in their real life. Four of the presented reactions are maladaptive and four – adaptive. The English ERP-R has previously been shown to have strong internal validity and reliability, making it a trustworthy tool for emotion regulation strategy assessment. As this is a scenario-based questionnaire with eight possible responses to each of them, which participants have to pick one of, the Cronbach's alpha test is not appropriate for this scale.

Difficulties in Emotion regulation (*DERS-18;*Victor & Klonsky, 2016)) scale was developed for multifaced emotion dysregulation evaluation. Victor and Klonsky (2016) adjusted the original questionnaire to make a short version of the scale (18 items). This questionnaire is developed to investigate six key areas: nonacceptance of emotional responses, impulse control difficulties, difficulties engaging in goal-directed behaviour, lack of emotional awareness, lack of emotional clarity, limited access to emotion regulation strategies, and difficulty in engaging in goal-directed behaviours. The scale consists of 18 statements that can be evaluated on a 5-point Likert scale, ranging from almost never to almost always (e.g., "*When I'm upset, I become embarrassed for feeling that way*" or "*When I'm upset, I have difficulty focusing on other things*"). The measure has good psychometric properties showing internal consistency, construct and predictive validity and test-retest reliability, making this an appropriate scale to assess emotion regulation difficulties. For the Lithuanian sample in the current study, Cronbach's alpha was 0.86 which demonstrates strong reliability for the full DERS scale. All subscales were also tested, alpha was 0.7 for the Awareness, 0.89 for impulse, 0.91 for goals and 0.55 (below acceptable threshold, however, acceptable for short subscales) for the strategies subscales.

Responses To Positive Affect (RPA) questionnaire was used to measure the tendency to react to positive mood with ruminative or dampening responses (Feldman et al., 2008; Look et al., 2010). This measure was developed as a complimentary scale for other questionnaires focusing more to responses to negative affect and is meant to be used to study regulation of positive emotions. The measure consists of three subscales – self-focused positive rumination, emotion-focused positive rumination and dampening. Each of the three are meant to reflect different emotion regulation strategies fused for positive emotions either by enhancing them, sustaining or reducing their intensity. The questionnaire consists of 17 statements (e.g., "*When you are feeling happy, how often do you think "I am living up to my potential"?"),* evaluated on a 4-point Likert scale ranging from almost never to almost always. The English version of this questionnaire was shown to have acceptable incremental and structural validities and internal consistency. In this paper, the calculated Cronbach's alpha for full RPA was 0.75, for the emotion-focused positive rumination scale – 0.71, for dampening scale – 0.74 and for self-focused positive rumination 0.75. Thus, RPA and all its subscales were demonstrated to have good internal consistency for the Lithuanian sample.

Mood instability. Trait mood instability was measured using the *Affective Lability Scale* (ALS-SF (Look et al., 2010; Oliver & Simons, 2004)). The scale was developed to assess the degree of fluctuations of mood experienced by individuals. The short version developed from an original 54-item scale consists of 18 statements (e.g., "*I switch back and forth between being extremely energetic and having so little energy that it's a huge effort just to get where I am going*") that can be evaluated using a 4-point scale from "very uncharacteristic of me to "very characteristic of me". The scale

maintains a six-factor structure with its six subscales measuring fluctuations between euthymia and hypomania, depression, anxiety and anger as well as biphasic shifts between anxiety and depression as well as hypomania and depression. The English ALS-EF has been validated and was shown to be a fitting tool to use to measure affect lability in research (Oliver & Simons, 2004). In the current sample, ALS showed very good internal consistency with Cronbach's alpha of 0.89. Cronbach alpha test was also performed on all ALS subscales: anxiety (α = .86); anger (α = .7); depression (α = .58); shift between anxiety and depression (α = .75); hypomania (α = .64); shifts between hypomania and depression (α = .79). Thus, ALS subscales showed good or acceptable internal consistency, excluding depression and to lesser extent hypomania subscales. While inclusion of subscales in calculations is desired and can provide deeper insights, depression subscale was not essential in this research. For this reason, depression subscale was excluded from the analyses, while hypomania subscale was still included, however, any analyses including it were interpreted with caution.

State mood instability. State mood instability was evaluated using The Internal States Scale (ISS, Bauer et al., 2000). This scale was designed to assess mood states in people with BD diagnosis, however, it also has been shown to be reliable across different contexts. The questionnaire consists of 15 items and four subscales including Activation (ACT), Well-being (WB), Perceived Conflict (PC), and Depression Index (DI). For the current study, activation and depression indexes were included in analyses. ACT and DI scales have been shown to correlate meaningfully with clinical mania and depression measurements (Bauer et al., 2000). In the current study, all ISS subscales were demonstrated to have good internal consistency (Cronbach's α (ACT) = 0.76; α (WB) = 0.88; α (PC) = 0.77; α (DI) = 0.76).

Momentary assessment questions. The momentary assessment questions were presented to participants via an M-path app and assessed their moods at the moment. The presented items included questions about the levels of mood (e.g., "*How positive are you feeling from 1 to 100?"*) as well as their emotion regulation strategies used at the moment of receiving the survey notifications (e.g., "*have you been doing any of the following in response to your feelings?*"). Multiple emotion regulation strategy options were presented as well as an option "*I am not trying to change my thoughts/feelings*". The ESM for emotion regulation strategies was based on the previous study, thus replicating the previously used methods, participants were allowed to choose multiple answers, as individuals tend to use multiple emotion regulation strategies at the time (Daros et al., 2020). To make the survey as brief and as understandable as possible, the strategies were also described in lay terms. For example, positive reappraisal was presented like this: "*changing my perspective to be more positive*", while attention reorientating: "*trying to distract myself from thoughts/feelings*").

Invalidating environment. Adulthood. The invalidation which might be experienced in present was assessed using *the Perceived Invalidation of Emotion Scale (PIES*, Zielinski & Veilleux,

2018). This tool was designed for perceiver emotional invalidation levels evaluation. It measures the extent to which individuals feel their emotions are disregarded or seen as inappropriate by other people. There are 10 items in the questionnaire describing different types of validation that participants rate on a 5-point Likert scale (from "Almost never" to "almost always) based on how often they experience it in their real life (e.g., "*When I share how I'm feeling, others don't seem to mirror or match my emotions. For example, they don't share sadness with me when I'm sad or happiness with me when I'm happy*"). The English PIES has been validated and shown to have reliability and construct validity as an appropriate measure for both the clinical and general population. In this research, PIES overall scale showed very good internal consistency with Cronbach's alpha of 0.88.

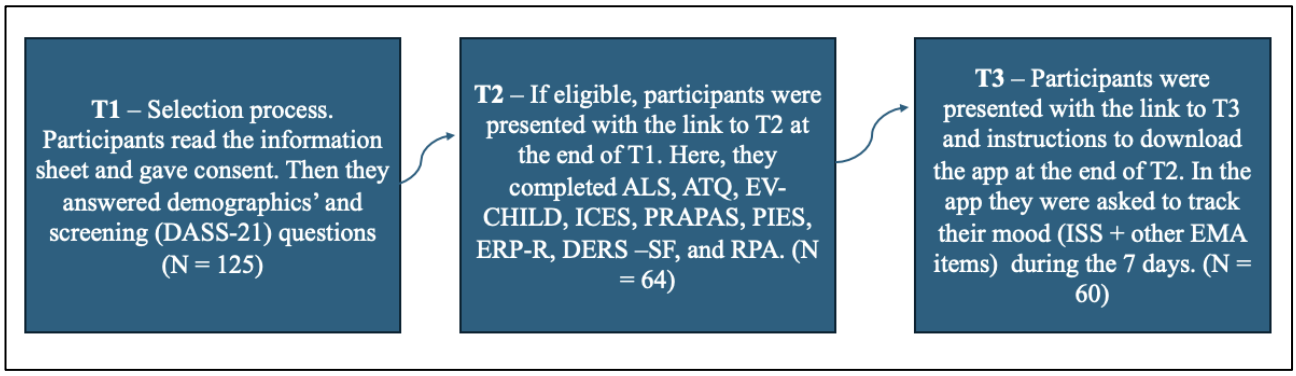
Invalidating environment. Childhood. Childhood invalidation was evaluated with two questionnaires. First one was the *Invalidating Childhood Environment Scale*, measuring the experiences of validation within the family during the childhood (ICES; (Mountford et al., 2007; Robertson et al., 2013). ICES has two main parts. The first part includes 14 statements (e.g., "*My parents made me feel OK if I told them I didn't understand something difficult the first time*") reflecting parental behaviours in eight themes (ignoring thoughts and judgements; ignoring emotions; negating emotions, negating thoughts and judgements, over-reacting to emotions, overacting to thoughts and judgements, overestimating problem-solving, and oversimplifying problems). These statements are rated using a 5-point Likert scale (ranging from never to all the time for both parents). The second part includes four different family environments (chaotic, validating, typical and perfect) that are evaluated on a 5-point Likert scale (ranging from "not like my family" to "like my family all the time"). The *Typical* family type is defined as one focused on success and controlling emotions, *Perfect* type includes families which encourage to hide emotions and push through any situation, while *Chaotic* families are mainly distinguished by parents being distant and not easily available to their child. The *Validating* type includes families in which children's emotions are validated and accepted appropriately (Robertson et al., 2013). The English ICES is validated and is a reliable tool to assess the impact of family dynamics. In Lithuanian sample of the current study, calculated Cronbach's alpha for overall ICES score was very good both for invalidation experience part of questions and the second part for family environments (respectively 0.94 and 0.75).

Parental Responses to Adolescents Positive Affect Scale (PRAPAS) was used for paternal responses to positive emotions evaluation (S. Nelis et al., 2019). PRAPAS was designed to assess parents' responses to their adolescents' positive emotional experiences. It includes two scenarios describing positive emotion-causing situations (e.g., receiving a good grade in the test). Participants then rate possible behaviours of their parents (e.g., "*tell me that I shouldn't be too happy, because I will have to work hard if I want to keep getting good grades"*) on a 5-point scale from "very unlikely"

to "very likely" that their parents would have responded the described way. The scale also includes two subscales – parental dampening (minimizing and invalidating positive experience) or parental enhancing (affirming and celebrating positive experience). The English scale was shown to have a good internal consistency. In the current research, PRAPAS scale showed good internal consistency for both paternal (α (enhancing) = 0.93; α (dampening) = 0.84) and maternal (α (enhancing) = 0.91; α (dampening) = 0.86) subscales.

2.3. Procedure

2 Figure Procedure of the current project.



First after clicking the survey link, participants were presented with information about the study and after providing informed consent were directed to the first part – selection process (T1). If eligible, at the end of the selection survey, participants were provided a link to the main survey (T2). Afterwards, participants were invited to install an application (M-path) on their smartphones that was used to collect experience sampling data (T3). This included participants receiving short in-the-moment questions related to their mood five times per day for 7 days. The survey notifications were scheduled to appear between 9:30 AM and 9:30 PM, every three hours. The surveys stayed open for half an hour after the first notification so that they accurately reflect the moods and opinions of participants as they were in the "*here and now*" moment. The participants received reminder notifications twice during the 30-minute windows if they did not respond. The ESM was extended by one additional day for those participants, who failed to respond to more than four assessments on a given day. The ESM also included questions about emotion regulation strategies used in the moment with multiple choices available. The debrief explaining the research in more detail was provided after the ESM part was closed.

2.4. Data analysis

The statistical analysis for this project was done using RStudio Version 2024.12.1+563 and SPSS 29. To review and organise collected data, descriptive statistics, and the internal validity of questionnaire subscales (Cronbach alpha) were calculated. The Shapiro-Wilk criterion and the histograms were used to evaluate the normality of the data. It was found that most of questionnaires' data was not normally distributed. Because of this Spearman's correlation test was used for correlations between mood stability (momentary assessment, ALS) and invalidating experience (ICES, PIES, PRAPAS). Before conducting the multiple or linear regression analyses for first, second and third hypotheses, the assumptions for regression were tested using the R package Global Validation of Linear Model Assumptions (GVLMA). The assumptions were assessed by visually assessing the scatterplots for linearity of variable relationships, variance inflation factor was assessed for multicollinearity issues, while independence of residuals was tested using Durbin-Watson test. For homoscedasticity, Breusch-Pagan and Non-Constant variance tests were selected and the Shapiro-Wilk test, along with visual inspection of Q-Q plots and histograms was used for residuals' normality check (Pena, 2022; Pena & Slate, 2006). The assumptions were not violated for any of the models.

For the second hypothesis, multiple regression was performed. For the third hypothesis, Hayes mediation model 4 was used (Hayes, 2022). For the fourth hypothesis, moderation analyses were performed to test whether emotional vulnerability moderated the relationship between invalidation and mood instability using the PROCESS model 1 (Hayes, 2022). To check for the moderation assumptions, scatter plots were visually examined with linear regression lines for each of the combination. The assumptions were not violated for any of the combinations of independent and dependent variables.

When calculating ecological momentary assessment scores of state mood instability, standard deviations (SD) were calculated for each full entry of every participant, to create a variable for fluctuation of each measured mood. The ISS subscale scores were calculated for each participant's entry and the SDs were used to create single ISS subscales' scores per participant per subscale. Furthermore, participant responses to momentary emotion regulation questions (e.g., "Are you ashamed about how you feel?) were counted for each entry (Yes = 1; No = 0) and then the proportion was calculated for each participant based on the number of entries they had to create one score per participant per emotion regulation question.

3. RESULTS

The descriptive statistics for all main variables explored in the current study are presented in tables 1 to 4. All variables demonstrated good variability, indicating that the current sample consisted of a broad range of experiences in invalidation, emotional vulnerability, mood instability and emotional regulation strategy use. Maladaptive emotion regulation strategy usage (M (maladaptive strategy use score) = 4.44) was less prevalent compared to adaptive (M (adaptive strategy use score) = 11.67), however, that is expected in a healthy population. From all state mood instability variables, the most variation was recorded in happiness (M = 17.1) and anxiety (M = 16.97).

1 Table*: Means, standard deviations and minimum/maximum values of invalidation variables*

	N	Minimum	Maximum	Mean	SD
Current perceived invalidation (PIES)	64	10	32	16.81	5.925
Childhood invalidation (ICES total)	64	15	53	31.33	9.630
Maternal enhancing responses (PRAPAS)	63	15	66	40.62	12.615
Paternal enhancing responses (PRAPAS)	64	14	69	32.36	13.373
Maternal dampening responses (PRAPAS)	63	10	41	19.35	8.180
Paternal dampening responses (PRAPAS)	64	8	35	16.17	6.015

2 Table*: Means, standard deviations and minimum/maximum values of mood instability variables*

	N	Minimum	Maximum	Mean	SD
Trait mood instability (ALS total)	64	20	64	35.11	9.162
Activation subscale (ISS)	60	2	26	9.28	4.771
Depression subscale (ISS)	60	2	33	13.52	7.346
Anger fluctuations	60	2	28	13.39	7.333
Sadness fluctuations	60	3	36	15.71	7.470
Happiness Fluctuations	60	6	28	17.10	5.314
Anxiety Fluctuations	60	3	33	16.97	7.148

3 Table: *Means, standard deviations and minimum/maximum values of emotional vulnerability variables*

	N	Minimum	Maximum	Mean	SD
Hyperthymia	64	0	9	4.83	2.179
Cyclothymia	64	1	10	5.25	2.116
Dysthymia	64	0	10	4.20	2.033
Emotional vulnerability (Childhood)	64	25	108	63.55	20.801

4 Table: *Means, standard deviations and minimum/maximum values of emotion regulation variables*

	N	Minimum	Maximum	Mean	SD
Adaptive strategy use (ERP-R)	64	1	22	11.67	3.546
Maladaptive Strategy use (ERP-R)	64	0	15	4.44	2.731
DERS total	64	26	76	38.34	9.380
Emotion Focus subscale (RPA)	64	7	16	11.47	2.225
Dampening subscale (RPA)	64	8	28	13.59	3.829
Self-focus subscale (RPA)	64	4	16	9.81	2.949

3.1. Relationship between mood instability and invalidating experience

To investigate hypothesised relationships between mood instability and invalidating experiences in past and present, Spearman's correlations were conducted for trait instability (ALS total score and all subscales), state mood instability (ISS Acceptance and Depression subscales and ESM measures' SD's), and total score of childhood invalidating environment (ICES and its subscales) as well as current invalidation (PIES) and PRAPAS subscales (maternal/paternal enhancing and dampening responses to adolescent's positive affect). See table 5 for the Spearmans's coefficients.

The analysis revealed a significant positive relationship between trait mood instability measured by ALS and invalidation experienced in childhood (total ICES scores). There were no significant correlations between ALS total and current invalidation (PIES total), or parental responses

to positive emotions (PRAPAS). When exploring ALS subscales, positive significant correlation was found between scores of invalidating environments in childhood and the fluctuations between euthymia and anxiety subscale as well as biphasic shifts between anxiety and depression subscale. The biphasic shifts between anxiety and depression subscale also positively correlated with perceptions of Perfect family style and negatively correlated with enhancing paternal responses to positive affect.

Spearman's correlation test was also used to investigate the relationship between state mood instability, for fluctuations of all moods. The results revealed no significant correlation between happy or angry mood fluctuations or the general mood instability score and any of the variables reflecting total experienced invalidation in the past or the present. However, invalidating environment in the childhood was positively and significantly correlated with variability of experienced sadness as well as anxiety. Notably, significant negative correlation was found between the perception of the Perfect family type measured by the ICES scale and variability of sad as well as anxious moods.

Finally, Spearman's test was also used to assess the correlations between the subscales of Internal State scale (ISS) and invalidation measures for the present and the past. The activation scores were shown to have positive significant relationship with validating family style and the ISS depression subscale was found to have negative correlation with perceptions of perfect family style.

Linear regression was then performed to further investigate whether childhood invalidation predicts mood instability (DV – trait mood instability (ALS total) and predictor – childhood invalidation (ICES total). Assumptions for linearity, outliers (Cook's distance < 1), multicollinearity (VIF < 4), and residual normality were tested and met. Total childhood invalidation was shown to predict mood instability ($R^2 = .08$, $F(1, 63) = 5.4$, $p = .023$), explaining 8% of variance.

5 Table. *Spearman's coefficients between ALS and its subscales, state mood instability and invalidating experiences in the present and the past*

	Maternal enhancing responses (PRAPAS)	Paternal enhancing responses (PRAPAS)	Maternal dampening responses (PRAPAS)	Paternal dampening responses (PRAPAS)	Childhood invalidation (ICES total)	Chaotic	Perfect	Typical	Validating	Current perceived invalidation (PIES)
Trait mood instability (ALS total)	.052	-.187	.058	.133	**.319***	.240	-.218	.178	.099	.135
Anger (ALS)	-.077	-.095	.059	.098	.188	.146	-.086	-.045	.001	.244
Anxiety (ALS)	.025	-.213	.248	.159	**.344****	.210	-.214	.116	.123	.185
Hypomania (ALS)	-.003	-.086	.069	.175	.209	.143	-.121	.234	.121	.111
Biphasic shifts between hypomania and depression	.067	-.184	-.145	.022	.198	.112	-.017	.192	.097	.137
Biphasic shifts between anxiety and depression	-.168	**-.339****	.082	.063	**.408****	.231	**-.375****	.096	.135	.037
Anxiety fluctuations (ecological momentary assessment)	-.059	-.005	.003	-.153	**.312***	.207	**-.283***	.115	.168	.041

Sadness fluctuations (ecological momentary assessment)	-.240	-.117	.054	-.150	**.265***	.244	**-.316***	.174	.090	.059
Anger fluctuations (ecological momentary assessment)	-.156	-.070	-.049	-.148	.119	.154	-.220	.075	.009	.138
Happiness fluctuations (ecological momentary assessment)	.219	.025	-.059	-.043	.002	.029	.013	-.095	-.051	-.072
Activation (ISS)	-.045	-.085	.099	.009	.211	.233	-.065	.160	**.260***	-.022
Depression (ISS)	-.121	-.065	-.052	-.170	.139	.124	**-.351****	.131	.030	-.043

Note. *p < .05; **p < .01. Spearman's rank-order correlations.

3.2. Mediating role of emotion regulation

To investigate the second hypothesis, the Spearman's correlations were performed to explore the relationships between emotion regulation strategies and past and present invalidation (see **table 6**) as well as state and trait mood instability variables (see **table 7**). None of the emotion regulation variables were shown to correlate with invalidation experienced in childhood. The significant positive correlations were found between current invalidation and total emotion dysregulation (DERS), Clarity subscale (DERS) as well as being more ashamed or confused about one's emotions based on ecological momentary assessment questions. Also, the level of non-accepting one's emotions (DERS subscale) was negatively associated with growing up in a family perceived as *perfect* and positively correlated with a *chaotic* family type (ICES subscales). Enhancing reactions to positive emotions from both parents (PRAPAS) correlated with higher emotion focus scores (DERS subscale) and negatively correlated with maternal dampening responses to positive affect (PRAPAS). Interestingly, maternal enhancing responses also negatively correlated with maladaptive emotional regulation scores in general (ERP-R maladaptive emotion regulation strategy score) as well as positively correlated with emotion focus and self-focus responses to positive affect (RPA). Finaly, perceiving one's family as *chaotic* (ICES subscale) positively correlated with being more ashamed of one's emotions in the moment (ecological momentary assessment question).

Meanwhile, when investigating emotion regulation strategy usage associations with mood instability, ALS total score was shown to significantly positively correlate with emotion dysregulation scores (DERS total), DERS Clarity, Impulse, Goals, Non-acceptance, Strategies subscales as well as dampening responses to positive affect (RPA).

When investigating state mood instability, depression subscale of ISS negatively correlated with usage of adaptive emotion regulation strategies and positively correlated with maladaptive strategies in ERP-R as well as with dampening responses to positive emotions (RPA) and being more confused about one's emotions in the moment. Activation subscale (ISS) positively correlated with being more ashamed about one's emotions in the moment.

6 Table. *Spearman's correlations between emotion regulation and invalidation variables*

	Maternal enhancing responses (PRAPAS)	Paternal enhancing responses (PRAPAS)	Maternal dampening responses (PRAPAS)	Childhood invalidation (ICES total)	Chaotic	Perfect	Current perceived invalidation (PIES)
Maladaptive Strategy use (ERP-R)	**-.283***	-.198	.046	.141	.146	-.136	-.031
Clarity subscale (DERS)	.011	-.151	-.029	.177	.021	-.117	**.325****
Non-acceptance subscale (DERS)	.124	-.159	.079	.246	**.264***	**-.276***	.141
DERS total	.036	-.112	.001	.205	.086	-.168	**.254***
Emotion Focus subscale (RPA)	**.253***	**.287***	**-.251***	-.225	-.080	.050	-.100
Self-focus subscale (RPA)	**.280***	.179	-.240	-.200	-.050	.120	-.021
Ashamed (ecological momentary assessment, DERS)	-.085	-.093	-.005	.094	**.318***	-.118	**.309***
Accepting (ecological momentary assessment, DERS)	.175	.130	-.112	-.131	-.152	.042	**-.315***
Confused (ecological momentary assessment, DERS)	-.128	-.115	.038	.115	.150	-.239	**.287***

Note. *p < .05; **p < .01. Spearman's rank-order correlations.

7 Table: *Spearman's correlations between emotion regulation variables and mood instability*

	Trait mood instability (ALS total)	Anger (ALS)	Anxiety (ALS)	Hypomania (ALS)	Biphasic shifts between hypomania and depression	Biphasic shifts between anxiety and depression	Anger fluctuations (ecological momentary assessment)	Sadness fluctuations (ecological momentary assessment)	Anxiety fluctuations (ecological momentary assessment)	Activation (ISS)	Depression (ISS)
Adaptive strategy use (ERP-R)	-.243	-.131	-.243	-.064	-.119	**-.257***	-.036	-.128	-.005	-.038	**-.304***
Maladaptive Strategy use (ERP-R)	.206	.102	.201	0,026	.126	.214	.029	.189	-.040	-.035	**.311***
Awareness subscale (DERS)	-.175	-.147	.015	-.219	.068	-.226	-.226	-.144	**-.301***	.030	-.131
Clarity subscale (DERS)	**.370****	**.313***	**.331****	**.252***	**.385****	.188	.001	.082	.078	-.016	-.048
Impulse subscale use (DERS)	**.338****	**.477****	.171	.073	**.271***	.154	-.002	-.026	.224	.203	.127
Goals subscale use (DERS)	**.368****	**.340****	**.249***	.025	.222	**.352****	.163	.188	.225	.129	.206
Non-acceptance subscale (DERS)	**.466****	.191	**.375****	**.280***	**.359****	**.291***	.132	.216	.166	.248	.070

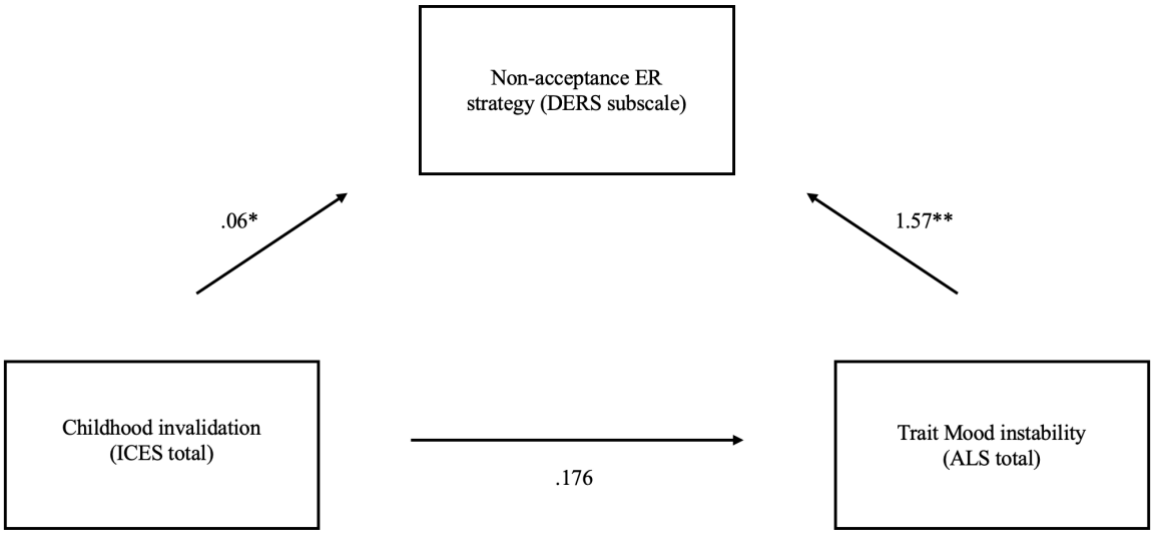
Strategies subscale (DERS)	**.253***	**.343****	.139	.122	**.417****	.205	.224	.125	.239	.018	.021
DERS total	**.422****	**.394****	**.341****	.103	**.439****	**.292***	.122	.167	.203	.151	.141
Emotion Focus subscale (RPA)	.084	-.022	-.083	.191	-.025	.036	**.256***	.224	**.333****	.008	.125
Dampening subscale (RPA)	**.297***	.093	.185	.236	.079	.076	.068	.011	-.122	-.004	**.354****
Self-focus subscale (RPA)	.125	-.018	-.018	.237	.105	.074	.245	.184	**.268***	.039	.096
Ashamed (ecological momentary assessment, DERS)	.082	-.077	.121	-.060	.046	.226	**.377****	**.389****	.113	**.263***	.208
Confused (ecological momentary assessment, DERS)	.120	-.032	.147	.057	.037	**.279***	**.329***	**.400****	.118	.128	**.368****

Note. *p < .05; **p < .01. Spearman's rank-order correlations.

The mediation analyses were conducted to test whether emotion regulation scores mediate the relationship between mood instability and invalidation experiences in childhood. The total effect of childhood invalidation on mood instability was significant (B=0.269, p=.023, 95% CI [0.038, 0.501]). However, the direct effect was non-significant (B = 0.198, p = .063) as well as the indirect effect with emotion dysregulation (B = .071, 95% CI [–0.011, 0.171]), indicating that emotion regulation difficulties (DERS total) did not significantly mediate the relationship.

When looking into DERS subscales, as mediators, non-acceptance of emotional responses subscale was shown to mediate the relationship (See Figure 3). The non-acceptance and childhood invalidation explained 23.38% of variance in trait mood instability (F [2, 61] = 9.31, p < .001). The mediation effect was shown to be present (indirect effect = .093, 95%, CI [.02 – 0.2], direct effect = .176, p = .115, total effect = .269, p = .023). The mediation analysis (using 5,000 bootstrap samples) indicated a significant indirect effect of childhood invalidation on mood instability via non-acceptance (*B* = 0.093, *SE* = 0.044, *z* = 2.10, *p* = .036, 95% CI [0.01, 0.19]). In the model, childhood invalidation showed borderline significant association with non-acceptance of emotions (B = 0.059, p = .05), and non-acceptance predicted mood instability (B = 1.573, p < 001). The direct effect between childhood invalidation and mood instability became not significant when controlling for non-acceptance (B = .1759, p = .115). These findings suggest that non-acceptance mediates the relationship between childhood invalidation and mood instability.

3 Figure *Childhood invalidation, non-acceptance emotion regulation strategy and trait mood instability mediation model.*



Note. **p < .05; **p < .001. The values are unstandardised.*

3.3. Relationship between mood instability and emotional vulnerability

To investigate the relationship between emotional vulnerability and trait mood instability, Spearman's correlation was conducted). Total trait like mood instability (ALS total) was shown to have a positive significant relationship with cyclothymia (ATQ) and emotional vulnerability in childhood measured by EV-CHILD questionnaire. Among ALS subscales, positive significant correlation was found between cyclothymia and anxiety as well as biphasic fluctuations between depression and anxiety subscales. The fluctuation between anxiety and depression subscale also positively correlated with emotional vulnerability in childhood scale.

The Spearman's correlation analyses were also performed to investigate how emotional vulnerability might predict state mood instability. The ATQ subscales, EV-child total score and ISS activation and depression subscales, as well as specific mood fluctuations were investigated. Childhood emotional vulnerability correlated with ISS activation and ISS depression subscales ($p = .045$) as well as fluctuations of sadness measured during ecological momentary assessment. Hyperthymia scores also correlated positively and significantly with fluctuations of anger.

Multiple regression was then performed to examine whether cyclothymic temperament (ATQ) and emotion vulnerability in childhood together predict higher trait mood instability (ALS total). The overall model was significant ($F(2,61) = 5.4$, $p = .007$), explaining 15% of mood instability variance (See **Table 9**)

9 Table. *The roles of emotional vulnerability and cyclothymia as predictors of trait mood instability*

Outcome	Trait mood instability (ALS total)				
Predictors	*Beta (β)*	*p*	*F*	*P*	R^2
			5.407	.007	.388
Cyclothymia (ATQ)	.319	.011			
Emotional vulnerability in childhood (EV - CHILD)	.160	.193			

Note. Beta – Standardised regression coefficient, p – significance of Beta coefficient, F – F statistics of the overall model, P – significance of overall model, R^2 – coefficient of determination.

8 Table. *Spearman's coefficients between emotional vulnerability and mood instability*

	Emotional vulnerability (Childhood)	Hyperthymia (ATQ)	Cyclothymia (ATQ)	Dysthymia (ATQ)
Trait mood instability (ALS total)	**.31***	.01	**.34****	.19
Anger (ALS)	.16	.05	.15	.11
Anxiety (ALS)	.23	-.10	**.28***	.08
Hypomania (ALS)	.21	.20	**.24***	.03
Biphasic shifts between hypomania and depression (ALS)	.18	.06	.2	.07
Biphasic shifts between depression and anxiety (ALS)	**.33****	-.11	**.31***	**.26***
SD Angry	.14	**.28***	-.17	-.17
SD Sad	**.34****	.11	-.02	.014
SD Happy	-.06	-.06	-.01	-.08
SD Anxious	.14	.07	.09	.04
ISS Activation	**.4****	.19	.011	-.05
ISS Depression	**.26***	-.05	.08	.08

Note. * p < .05; ** p < .01. ALS = Affective Lability Scale; SD = Standard deviation of ecological momentary assessment-reported mood; ISS = Internal State Scale.

3.4. The role of emotional vulnerability

To investigate whether emotional vulnerability (EV-child total, ATQ subscales) moderated the relationship between invalidating environment (ICES total) and mood instability (ALS total, ALS subscales and momentary assessment variables), series of moderation tests were performed. To assess whether the data is suitable for moderation analysis, Spearman's correlation was first performed to investigate whether invalidation variables correlate with emotional vulnerability (See **table 10**). Positive significant correlation was found between all invalidation variables and childhood emotional vulnerability (EV-CHILD). Moreover, cyclothymia (ATQ) correlated positively and significantly with childhood invalidation (ICES total). Notably, currently perceived invalidation (PIES total), paternal dampening reactions to positive emotions (PRAPAS) and hyperthymia (ATQ) did not significantly correlate with any of the variables. The Spearman's correlation analyses with mood instability variables and invalidation are reflected in the **table 5**, while between mood instability and emotional vulnerability variables – **table 8**.

10 Table *Spearman correlation coefficients including invalidation and emotional vulnerability Variables (N = 60–64)*

	Childhood invalidation (ICES total)	Maternal enhancing responses (PRAPAS)	Paternal enhancing responses (PRAPAS)	Maternal dampening responses (PRAPAS)	Chaotic	Perfect	Typical	Validating
Cyclothymia (ATQ)	**.25***	-.14	.15	.24	.156	-.127	.118	.146
Dysthymia (ATQ)	.245	-.044	-.161	.039	.141	**-.3***	.1	.05
Childhood emotional vulnerability (EV-CHILD)	**.480****	**-.414****	**-.313***	**.33****	**.34****	**-.41****	**.52****	**.42****

Note. *p < .05. **p < .01. Spearman's rank-order correlations.

Moderation analyses were performed with trait mood instability (ALS total) as an outcome variable and cyclothymia or childhood emotional vulnerability as moderators. The models were checked for moderation assumptions before preforming the analysis. While EV-CHILD scores correlated with invalidation variables, the VIF scores were lower than 5 and thus multicollinearity was not a concern. Nevertheless, none of the interactions did not reach statistical significance (all p > .1), thus biological vulnerability scores did not moderate the relationship in the current sample (see **table 11** for an example).

11 Table. *Childhood invalidation * Childhood emotional vulnerability model explaining trait mood instability*

			95% CI		
	B	SE	LL	UL	p
Childhood Invalidation (ICES total)	.555	.358	-.159	1.271	.271
Childhood emotional Vulnerability (EV-CHILD total)	.242	.189	-.135	.619	.204
Interaction (ICES total x EV-CHILD total)	-.006	.006	-.0167	.005	.309

Note. B – unstandardized coefficient, CI – confidence interval; SE – standard error, LL and UL – lower and upper limits of confidence interval, p – p value.

4. DISCUSSION

The current research aimed to evaluate the potential associations between mood instability, emotion regulation strategies, emotional vulnerability and invalidating experiences. Both state and trait mood instability were investigated in this paper to further analyse the differences between mood instability as a personality characteristic versus momentary response to external or internal stimuli. The findings contributed to the previously limited understanding of the development of mood instability in the Lithuanian population specifically. They added to this research field by including a wide range of age groups as well as both ecological momentary assessment tools and retrospective questionnaires. The results revealed that in the current sample, past but not presently perceived invalidation significantly correlated with mood instability, contributing to the growing evidence supporting Linehan's biosocial model (Crowell et al., 2009; Lee et al., 2023; Linehan, 1993; Sauer & Baer, 2010). Non-acceptance of emotional responses (maladaptive emotion regulation strategy) stood out as a mediator between invalidation and mood instability. Childhood emotional vulnerability positively correlated with higher levels of trait and state mood instability measures. Nevertheless, emotional vulnerability variables did not moderate the relationship between invalidation and mood instability, contradicting the fourth hypothesis.

Importantly, the results of the current study have both practical and theoretical implications. The novel identification of non-acceptance of emotions as a mediator between invalidating childhood experience and mood instability provides further direction for therapies that focus on emotion regulation skill training (e.g., dialectical behavioural therapy or emotion-focused therapy). It also brings insight for the Biosocial model theoretical framework, suggesting that specific emotion regulation strategies might have a greater role in mood instability development compared to emotion dysregulation as a generalised construct. Furthermore, the findings add to existing literature highlighting the role of early life experiences and emotional vulnerability in the emotion regulation and mood instability development. This supports the importance of practices focusing on emotion validation training for parents and psychoeducation about emotions. Considering that mood instability is a prevalent problem in Lithuania, both in clinical population and individuals with no prior psychiatric diagnoses, the current findings are a meaningful addition to current understanding of this construct in this cultural context, which can inform future studies that aim to improve emotional health in the country.

4.1. Invalidation and mood instability

The first hypothesis suggested that invalidating experiences both in the past and present will be positively associated with the trait and state mood instability. The statistical analyses revealed that trait mood instability significantly correlated with invalidation experienced in childhood, but not with the currently perceived invalidation. Interestingly, when investigating ALS subscales, it was found that biphasic shifts between anxiety and depression, as well as more fluctuations between euthymia and anxiety were also significantly associated with childhood invalidation separately. There was no significant association found between most state mood instability measures and invalidation, however, specifically, fluctuations of sadness and anxiety were shown to correlate with invalidating experiences in childhood. This is in line with the previous studies, which showed that childhood emotional invalidation is associated with mood swings, decreased well-being and psychopathology. For example, Krause and colleagues (2003) concluded that childhood emotional invalidation is associated with depression and anxiety symptoms. Moreover, the current findings support the framework of the biosocial model, suggesting that higher mood instability in adulthood is associated with early life invalidating experiences (Linehan, 1993). Thus, the current findings provide further evidence to the literature suggesting that invalidation early in life is associated with mood fluctuations in the adulthood (Krause et al., 2003; Patel et al., 2015) and has a long-term effect on affective development (Lee et al., 2022; Teicher et al., 2015).

However, the current results contradict the previous findings that linked state mood instability with currently perceived emotional invalidation (Zielinski et al., 2023). Such results support the notion that most mood instability problems develop early in life, and the invalidating experiences in adulthood have a lesser effect in comparison. However, it is also important to consider the differences in the research design of the studies before making any conclusions. The two studies were conducted in different cultural contexts – Zielinski and colleagues (2023) recruited psychology undergraduates in United States (M (age) = 19.21), while the current study included participants from different backgrounds and in a wider age range (M (age) = 29.1) and was conducted in Lithuania. The cultural backgrounds, emotional maturity and different social experiences of different age groups could have contributed to how emotional invalidation is understood and evaluated by the participants. For this reason, more investigations are required to be able to make any conclusions. Future research could include participants from more countries and use more than one measure for currently experienced invalidation so to understand its importance more accurately.

4.2. Role of emotion regulation in the relationship between mood instability and invalidation

The second hypothesis proposed that emotion regulation problems will mediate the relationship between childhood invalidation and mood instability. The Spearman's correlation analyses demonstrated emotion regulation strategies to be significantly associated with both past and present invalidation and mood instability (see table 6 and table 7). For example, maternal enhancing responses to positive affect negatively correlated with usage of maladaptive emotion regulation strategies, while dampening responses were associated with lower use of emotion focus positive rumination, which reflects savouring positive moments (e.g., thinking "I am so grateful I achieved this"). This is in line with previous studies and the biosocial model, highlighting early experiences in development of ability to regulate emotions as well as the importance of emotion regulation skills in mood disorders (Lee et al., 2023; Vanderlind et al., 2020). It also supports research which found maternal invalidation to have more meaningful impact on affective development compared to paternal, as no significant correlations were found between dampening paternal responses with any of emotion regulation or mood instability variables (Keng & Soh, 2018). Meanwhile, total score of emotion dysregulation was positively associated with trait mood instability and depression subscale of the Internal State scale. This further supports the biosocial model which suggests that higher mood instability is related to poor emotion regulation skills (Linehan, 1993). Thus, the current data replicated the associations between invalidation, emotion regulation and mood instability found in previous research.

The mediation analysis with the emotional dysregulation (DERS total score) as a mediator between childhood invalidation and trait mood instability was not significant, suggesting that even though invalidating experiences are associated with higher trait mood instability, emotional dysregulation does not mediate this relationship in the current sample. Previous research supporting the biosocial model suggested that usage of maladaptive strategies in general functions as a mediator between invalidation and mood instability, which was not confirmed in the current sample (Demir et al., 2020; Kanj et al., 2023). Similarly, study by Gill and colleagues (2018) found that emotional dysregulation scores measured by the DERS questionnaire did not mediate the relationship between childhood invalidation and developed BPD symptoms, which include mood instability. Both these and the current study findings raise the question whether emotional dysregulation as a whole is the key mechanism through which early experiences predict mood instability in adulthood. It is also important to consider using more emotional dysregulation evaluating questionnaires, as while widely used and showing good internal consistency, DERS questionnaire has been critiqued for asking

questions about unconscious processes, assuming respondents to reflect on these accurately and being too ambiguous (Smith & Racine, 2024)

Interestingly, the supplementary analyses investigating separate DERS subscales revealed that greater non-acceptance of emotions mediated the relationship between invalidating childhood experiences and trait mood instability later in life. This proposes another route for research demonstrating that investigating specific strategy usage instead of dysregulation as a whole might be more crucial than thought before. Such results are novel and partially align with literature. Previous studies concerning non-acceptance of emotions linked it with poor well-being and psychopathology and even defined it as the core mechanism in emotion regulation (Bailen et al., 2022; Mennin et al., 2007). Moreover, non-acceptance was shown to predict the intensity of experienced negative affect, which also emphasises the importance of interventions including acceptance training for mood disorders such as Dialectic Behaviour Therapy or Emotion – Focused therapy (Bailen et al., 2022). In the current study, non-acceptance was measured using DERS subscale, in which participants answered how often they react to their experienced emotions negatively (Gratz & Roemer, 2004). To further investigate the role of non-acceptance, future studies could employ more varied measurements, such as the Five Facet Mindfulness Questionnaire, which includes acceptance of emotions as one of the Nonjudge subscale elements and interprets it as one of mindfulness tools (Baer et al., 2022). This approach could contribute to understanding how accepting one's emotions can be learned and applied in managing mood instability difficulties (Baer et al., 2022; Bailen et al., 2022). Thus, the findings of the current study contribute to evidence supporting the importance of acceptance of emotions and its application as part of mindfulness practises as well as interventions targeting mood instability. Taken together, these results suggest that separate emotion regulation strategies should be included in the future research investigating the biosocial model as well as mood instability.

4.3. Emotional vulnerability and mood instability

The results revealed that emotional vulnerability is associated with both state and trait mood instability. This is in line with previous literature, suggesting that emotional vulnerability as a temperamental trait is associated with higher levels of mood instability (Janiri et al., 2021). Specifically, model including cyclothymic temperament and emotional vulnerability in childhood predicted higher trait mood instability. These results also contribute to Linehan's social model, suggesting that emotional vulnerability is one of the key elements in mood fluctuations and stability, presenting further support, first time in the Lithuanian sample (Lee et al., 2023). Furthermore, Lee and colleagues (2023) findings suggest that separate emotional vulnerability factors might independently predict BPD symptom development and in the current sample, cyclothymic

temperament showed to be positively correlating with total trail mood instability, and separately with shifts between euthymia and hypomania, anxiety or depression and biphasic shifts between depression and anxiety. However, it is important to note that in the current sample, the cyclothymic subscale had low internal consistency, which might decrease the reliability of these findings. The state mood instability variables were also significantly associated with emotional vulnerability in childhood. Both higher scores in depression and activation subscales were associated with higher vulnerability, which is in line with previous research as well as the biosocial model (Janiri, Moccia, Conte, et al., 2021; Lee et al., 2023). The current findings demonstrate that emotional vulnerability could be a key factor increasing emotional reactivity and mood fluctuations in the moment.

The significant correlations found between invalidation in childhood and emotional vulnerability found because of exploratory analyses, further contribute to research supporting the biosocial model. For example, Lee and colleagues (2023) suggested that higher emotional vulnerability might contribute both to teenagers perceiving their parents as more invalidating, while child's emotional vulnerability might increase invalidating reactions in parents, resulting in a self-perpetuating cycle. However, to confirm the bidirectional relationship between variables, longitudinal data is required, thus, future studies should explore this connection further using a longitudinal research design.

The moderation analyses performed were not significant and did not support the fourth hypothesis, which suggested that emotional vulnerability would moderate the relationship between childhood invalidation and mood instability. Such findings might indicate that these constructs might have individual, additive effects on mood instability rather than amplify each other's effects. The findings contradicted the previous literature and partially the biosocial framework which suggested that emotional vulnerability and childhood invalidation interact and in that way result in mood instability or emotion regulation problems (Linehan, 1993). However, emerging evidence has also shown emotional vulnerability to be connected to internalising symptoms and mood instability independently and thus, it might affect development of mood disorders separately from other constructs included in the biosocial model (Gill et al., 2018). Thus, the current findings indicate that emotional vulnerability and its role in mood instability should be studied separately, to clarify its independent role in the development of such problems as well as the potential implications for the treatment and prevention should be considered. Nevertheless, it is also important to consider that the current results can also be explained by the specifics of the sample, as all participants were from non-clinical population and recruited using convenience sampling which decreases the generalisability of the findings. Future research should aim to recruit a wider and more diverse group of participants to replicate the current results.

Overall, the findings discussed in the section highlight emotional vulnerability as a key construct in mood instability development. More investigations are needed to find out the exact role it has and how this construct interacts with childhood invalidation or emotion regulation when predicting mood instability. However, based on the current findings, emotional vulnerability stood as an independent predictor of mood instability, and if this is replicated in future research, it could be applied in interventions or preventative efforts focusing on mood instability problems.

4.4. The limitations and directions for future studies

While the current study provided novel findings and was the first to investigate the biosocial model in the Lithuanian population, there were also some shortcomings. Firstly, while diversity in age is considered to be a strength, the sample was relatively small, and participants were recruited using convenience sampling. Moreover, pre-existing clinical diagnoses were not controlled for, limiting the generalizability of the findings. Future research should aim for larger and more heterogeneous samples.

Moreover, when calculating scores for ecological momentary assessment questions, standard deviation was used. While this is a common way to deal with ecological momentary assessment data, SD does not account for temporal sequence or directionality of mood fluctuations. SD is also sensitive to outliers and thus, if some participants provided little input and had higher scores on one of the days that could have significantly affected their ISS scores. Future studies should also include alternative ecological momentary assessment measures, such as mean squared successive differences, in order to capture temporal dynamics and reduce the outlier sensitivity (Solhan et al., 2009).

The key limitation when investigating emotional vulnerability was that two out of three factors in the Affective Temperament Questionnaire – cyclothymic and dysthymic had insufficient internal consistency. This might have contributed to the validity of significant results, including these traits. Future studies should either include different measures or perform factor analysis for the Lithuanian version of the Affective Temperament Questionnaire, as this was the first study to use it.

It is also worth mentioning that as this study was cross-sectional, it was not possible to confirm the possible bidirectional effects of the correlations found (for example, between childhood invalidation and emotional vulnerability). Longitudinal studies would be more fitting to further investigate these interactions.

Finally, the exploratory findings revealed that specific maladaptive emotion regulation strategies (in this case, non-acceptance of emotions) might mediate the relationship between invalidation experienced in childhood and mood instability, which raises a question whether emotional dysregulation is the key factor in development of affective problems, as previously

suggested by the biosocial model. It is important to further investigate this in future studies, using a wider variety of measurements. Such findings might give direction for a better understanding of mood disorders as well as provide valuable insight for the interventions directed at managing problems involving mood instability.

CONCLUSIONS

1. In the current sample, higher childhood invalidation was shown to predict higher trait mood instability scores in adulthood. Fluctuations in state-like sadness and anxiety were also associated with childhood invalidation. Interestingly, currently perceived invalidation was not significantly associated with any of the mood instability variables.

2. The total score of usage of maladaptive emotion regulation strategies, positive emotions' regulation strategies, or overall emotion dysregulation did not mediate the relationship between invalidation and mood instability. However, the usage of non-acceptance emotion regulation strategy did significantly mediate the relationship between invalidating experiences in childhood and trait mood instability.

3. Emotional vulnerability was associated with higher trait mood instability levels. Emotional vulnerability in childhood also significantly correlated with higher state mood instability scores. Moreover, cyclothymia and emotional vulnerability in childhood were shown to be predictors of higher trait mood instability scores.

4. Emotional vulnerability did not moderate the relationship between experiences of invalidation and either state or trait mood instability.

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APPENDIX

KVIETIMAS DALYVAUTI KLINIKINĖS PSICHOLOGIJOS MAGISTRO TYRIME!

Sveiki!

Esu antro kurso klinikinės psichologijios magistrantė. Kviečiu dalyvauti klinikinės psichologijos tyrime "Emocijų reguliacijos strategijų sąsajos su nuotaikos svyravimais atsižvelgiant į nepalankias vaikystės patirtis ir emocinį pažeidžiamumą".

Tyrimą sudaro trys etapai - trumpa atranka (3min) pagrindiniai klausimai (30 min) ir savaitę trunkantis nuotaikos sekimas mobilioje M - path programėlėje. Nors klausimynas gana ilgas, būčiau be galo dėkinga ir prisidėtumėte prie psichologijos mokslo tobulėjimo Lietuvoje!

Spustelk čia, kad pradėtum klausimyną

Androido aplikacija | Apple aplikacija

Dalyvavimo kriterijai...

- Turite būti 18 metų ar vyresni;
- Esate Lietuvis ir lietuvių yra jūsų gimtoji kalba;
- Atrankos dalyje nesurinksite daugiau nei vidutinio balo Depresijos, nerimo ir streso skalėje;
- Turite galimybę atlikti pilną tyrimą.

Jei turite klausimų, drąsiai kreipkitės atsakydami tiesiogine žinute arba rašykite man luka.kemezyte@fsf.stud.vu.lt!

Informuoto sutikimo forma

Tyrimo pavadinimas

Associations of emotion regulation strategies with mood instability in relation to invalidating childhood experiences and emotional vulnerability

Tyrimo tikslas

Šiuo tyrimu siekiame suprasti kokios yra suaugusių asmenų emocijų reguliacijos ypatybės, kaip jos siejasi su asmens nuotaikų kaita ir kokį poveikį šioms sąsajoms turi vaikystės patirtys.

Dalyvavimas yra savanoriškas

Dalyvavimas šiame tyrime yra visiškai savanoriškas. Jei nuspręsite dalyvauti, galėsite bet kada pasitraukti iš tyrimo be jokių paaiškinimų ir be jokių neigiamų pasekmių.

Tyrimas susideda iš kelių dalių:

1. Pirmiausiai jus kviesime atsakyti į keletą atrankos dalyvauti tyrime klausimų – užpildyti demografinę anketą ir atsakyti į klausimus apie jūsų patiriamą stresą ir nerimą. Atsakymai į šiuos klausimus truks iki 10 min.

2. Jei esate pilnamečiai asmenys, kurių gimtoji kalba yra lietuvių ir šiuo metu nepatiriate padidėjusio streso ar nerimo, kviesime jus dalyvauti sekančiame etape – užpildyti klausimynus apie jūsų savijautą ir patirtis vaikystėje. Ši dalis truks apie 30-40 min.

3. Užpildžius elektroninį klausimyną kviesime į sekantį etapą, kuris truks 7 dienas – paprašysime atsisiųsti M-path aplikaciją į išmaniuosius telefonus, kurios pagalba galėsite registruoti ir patys stebėti savo nuotaikas bei savijautą (programėlė atsiųs jums priminimą prašydama atsakyti į kelis trumpus klausimus apie Jūsų savijautą 5 kartus per dieną nuo 9.30 val. iki 21.30 val. (9.30 val., 12.30 val., 15.30 val., 18.30 val., ir 21.30 val.). Kiekvienos iš 7 dienų pabaigoje Jūsų prašysime užpildys trumpą apklausą, atspindinčią jų bendrą nuotaiką ir veiklą tą dieną (trukmė iki 5 min.).

Kokie yra dalyvavimo tyrime privalumai?

Dalyvaudami šiame tyrime ne tik padėsite mokslininkams geriau suprasti emocijų reguliacijos ir nuotaikos svyravimo ryšius su ankstyvaisiais gyvenimo įvykiais, bet ir atrinkti tyrime dalyvauti asmenys turėsite galimybė stebėti, registruoti ir analizuoti savo emocinės savijautos pokyčius 7 dienų laikotarpyje, naudojantis mobiliąja programėle.

Duomenų konfidencialumas

Jūsų neprašysime pateikti asmeninių duomenų, pateikiant atsakymus į klausimus, prašysime susigalvoti savo kodą, kuris bus naudojamas viso tyrimo metu. Tai bus dviejų raidžių ir dviejų skaitmenų derinys (pvz.; jūsų pavardės pirmos dvi raidės ir telefono numerio paskutiniai du skaitmenys). Svarbu, kad kodą atsimintumėte, nes jis bus naudojamas susieti jūsų pirmos ir antros tyrimo dalies duomenims. Jūsų visi pateikti atsakymai bus konfidencialūs, o moksliniuose darbuose bus naudojami apibendrintai, negalint identifikuoti asmens.

Jei nuspręsite nutraukti savo dalyvavimą tyrime, galėsite kreiptis į tyrėjus ir atsiimti savo duomenis pateikę naudotą kodą - visi jūsų duomenys bus pašalinti ir toliau nebenaudojami tyrime.

Jei turite klausimų ar reikia daugiau informacijos, prašome drąsiai kreiptis į tyrėjų komandos vadovę doc. dr. Neringą Grigutytė el. paštu: Neringa.grigutyte@fsf.vu.lt

Tyrimą organizuoja VU mokslininkai doc. dr. Neringa Grigutytė, doktorantė Miglė Rudytė ir klinikinės psichologijos magistrantė Luka Kemežytė, bendradarbiaudami su kolegomis iš Ekseterio Universiteto (Jungtinė Karalystė) psichologijos doktorantūros studentu Xici Wan ir Dr. Kim Wright.