MODELING CAREGIVER-CHILD EMOTION REGULATION AND SOCIALIZATION PROFILES IN DAILY LIFE: A LATENT CLASS ANALYSIS EXPLORING ASSOCIATIONS WITH REGULATION SUCCESS AND EMOTIONAL LABILITY IN PRESCHOOL

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DISSERTATION ABSTRACT

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Title: Modeling Caregiver-Child Emotion Regulation and Socialization Profiles in Daily Life: A Latent Class Analysis Exploring Associations with Regulation Success and Emotional Lability in Preschool

The influence of caregiver responses to child emotions (ERSBs) on child emotion regulation development in preschool is well established. However, less is known about *how* caregivers regulate their own emotions (emotion regulation; ER) during daily parent-child interactions, or the relationship between caregiver ER and ERSB patterns. There is also a need to identify contextual and environmental variables which moderate the association between daily ER and ERSBs on regulation success, to inform targeted interventions which are responsive to differences in the presentations and needs of caregiver-child dyads. This dissertation used Ecological Momentary Assessment methods (N = 197, 3 surveys per day over 7 days) and Latent Class Analysis (LCA) to model daily ER and ERSB strategy profiles that the caregivers of preschool children use in daily life. Logistic regressions were run at the caregiver level to determine how caregiver ER is associated with caregiver responses to child emotions (ERSBs; also referred to as emotion socialization). Linear regressions modelled the relationships between caregiver ER and ERSB profiles and perceived success of regulating their own and their child's emotions. Across all measurement occasions, results indicated regulation success was highest for caregivers in ER and ERSB profiles characterized by frequent endorsement of "no regulation."

However, ERSB and ER profiles characterized by high diversity (e.g., flexibility) in strategy were most successful for regulating the emotions of children with high emotional lability, and for regulating caregiver emotions at timepoints when caregivers endorsed experiencing a negative emotion, respectively. Thus, results of this study suggest that competence with diverse ER and ERSB strategies, and flexible application of strategies across situations, may be particularly beneficial for caregivers managing difficult or variable emotions in themselves and their child.

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CHAPTER I

INTRODUCTION

Picture caregivers from two families who recently began attending therapy, with goals for parenting skill improvement. Both caregivers have 3-year-old children, and report difficulty managing their daily stress and managing frustration. They are attending parent management training (PMT), which teaches, among other things, how to use specific strategies to manage the emotional reactions that they experience while parenting (own emotion regulation; ER), as well as help manage their child's emotions (emotion regulatory socialization behaviors; ERSBs).

After several weeks of meeting with a therapist, caregiver 1 reports high levels of success with consistent implementation of the ER and ERSB skills. When it comes to regulating their own responses to their child's emotions, after trial-and-error with a variety of approaches, they have found that combining two of the evidenced-based ER strategies practiced in session have successfully helped them manage their own emotions and engage more calmly and warmly with their child. They have noticed that as they grow more regulated, their child does as well, and they must put forward less and less energy into managing their child's emotions.

Caregiver 2 is experiencing increased frustration, however. They successfully role play the ER and ERSB skills in session, but struggle to match and apply them to managing their child's unpredictable emotions in daily life. Some ERSBs seem to exacerbate their child's distress, in fact, and thus make it more difficult for the caregiver to regulate themselves. Given the caregiver's lack of perceived success of their efforts, they report increased frustrations, and decreased efficacy in managing their own and their child's emotions.

As most parents of young children are happy to tell you, caregiving is an emotionally evocative experience (Dix, 1991), and caregiver responses to their own and their child's emotions in daily life have a profound impact on child development (Eisenberg, 2020). Indeed, the caregiving context is understood to be a primary ecological context involved in shaping self-regulation development in early childhood (Montroy et al., 2016; Eisenberg et al., 1998). The prominent influence of caregiving on child regulatory development underscores the relevance of caregiver-mediated approaches to prevention and early intervention for a range of internalizing and externalizing behaviors in childhood (Hajal & Paley, 2020; Havighurst & Kehoe, 2017). Research in the past decade has made incredible strides towards identifying sets of parenting behaviors associated with positive child developmental outcomes, and this knowledge base comprises the foundation of a range of successful, evidence based PMT programs.

The processes influencing how caregivers choose ERSB strategies and respond to their child's emotions in ways that are more or less supportive of the child's own ER development is part of a suite of parenting behaviors referred to as "emotion socialization" (Eisenberg, 2020). Emotion socialization processes in daily life are complex and dynamic. As demonstrated by the vignette, caregiver ER impacts their ability to engage in ERSBs, and, in turn, caregiver ERSBs, and the child emotions and behaviors elicited by those ERSBs, impact a caregiver's ER capacity and choices. How competent a parent is at simultaneously managing their own emotions *and* a child's individual needs and behaviors are thus key variables involved in shaping a caregiver's momentary socialization behaviors, and the impact of those responses on child behavior over time (Dix, 1991; Hajal & Paley, 2020). Little is known about the processes by which the type and combination of strategies a caregiver implements to regulate their own emotions impact their implementation of ERSBs, and how successful they feel in managing their child's behavior with the ERSBs, in daily life (Zimmer-Gembeck, 2021). These gaps are particularly pertinent to understanding how intervention can best support caregivers of children with a range of ER competencies, given evidence that the development of children with greater emotional reactivity and intensity (i.e., greater emotional lability) in preschool may be most impacted by caregiver ERSB choices (Morris, 2007). Furthermore, child temperament is known to evoke caregiver ERSB responses, such that more labile or negative child emotions are linked with caregiving behaviors that are traditionally less supportive of child regulation development (Eisenberg, 2020). The present study thus aims to advance the state of the affective science and emotion socialization literature by 1) identifying common profiles of ER and ERSBs used by caregivers of preschool-aged children in daily life, 2) identifying which caregiver ER and ERSB profiles may act as facilitators and barriers to a caregiver's perceived success in managing their child's emotions, and 3) clarifying the role of child emotional lability and difficult behavior in moderating the success of caregiver ER and ERSB profiles.

Preschool Self-Regulation (SR) and Emotion Regulation (ER)

A remarkably strong body of evidence supports the link between the caregiving context and preschool self-regulatory development. The ages of 3-7 mark a critical shift from reactive or co-regulated behavior to independent modulation of affect, behaviors, and cognitions to guide goal-directed behavior, otherwise known as *self-regulation* (SR) (Karoly, 1993). SR is a complex, multifaceted construct which comprises several interrelated functional domains (e.g., emotional, motor, physiological, cognitive, social, motivational). This breadth has resulted in inconsistency in operationalization and measurement across studies interested in the implications of SR development in this period (Eisenberg et al., 2018). Across disciplines, SR is interchangeably referred to as executive functioning (Blair et al., 2014), effortful control (Graziano et al., 2010; Lengua et al., 2007), and ER (Riva Crugnola et al., 2016). Despite conceptual variability, there is consistent empirical agreement that the development of SR skills in early childhood is shaped by both biological and environmental variables (Bridgett et al., 2015; Morris et al., 2007), has strong links to prospective adolescent and adult academic and mental health outcomes when measured in preschool (Moffit, 2011), and is thus a critical focus for early identification and prevention efforts.

Emotion regulation (ER) is one facet of self-regulation which has increased in interest due to its consistent and strong prospective associations with negative developmental outcomes in childhood (Graziano et al., 2007), and strides made in the past two decades in measurement and conceptualization of the construct (McRae & Gross, 2020), and empirical evidence suggesting sensitivity to intervention in preschool children (Morawska et al., 2019). ER is commonly defined as the internal and external processes involved in initiating, maintaining, and modulating that emergence, intensity, and expressions of emotion to accomplish one's goals (Gross & Thompson, 2007; Hajal &Paley, 2020). The *internal* component of ER comprises the neurobiological and cognitive resources used to manage emotional arousal, including cognitive reframing, attention, and arousal modulation (Morris et al., 2017). Since the cognitive capacities underlying ER develop across early childhood, preschoolers rely heavily on *external* resources to modulate their emotions. Caregivers are consistently documented as the most proximal external resource involved in scaffolding the development of internal ER skills in preschool, underscoring the importance of prioritizing caregiver-mediated approaches to early emotional and behavioral interventions in this developmental period (Zachary et al., 2019; Hajal & Paley, 2020).

Moreover, early differences in ER are consistently and strongly predictive of important proximal and distal outcomes, thus situating them as an important focus for early childhood intervention. When measured in preschool, difference in ER skills predict school readiness, internalizing and externalizing disorders in childhood and adolescence, peer and family relationship quality, academic achievement, and in adulthood, substance abuse, mental health, and criminal convictions (Baker, 2018; Moffitt et al., 2011). ER demonstrates relative developmental stability from infancy through and beyond preschool, in the absence of intervention (Feldman, 2009; Kim & Kochanska, 2012). However, changes in preschool ER following targeted early intervention have demonstrated downstream impact on these adult outcomes (Moffitt et al., 2011). Given this established body of research on preschool ER, the caregiving context, and lifespan development, researchers have called for studies which specify in greater detail how to best intervene with child ER processes at various stages in early childhood development, especially in sensitive periods such as preschool (Moraskawa, 2019).

Emotion Regulatory Socialization Behaviors and Preschool ER

A large body of research characterizes patterns of *Emotion Regulatory Socialization Behaviors* (ERSBs) and their associations with child ER development (Eisenberg, 2020). ERSBs refer to caregiver responses to child emotion which shape children's understanding, experience, expression, and regulation of emotion (Eisenberg, 1998). Specifically, patterns of “positive caregiving behaviors” (e.g., warmth, attentiveness, responsivity, and positive reinforcement for appropriate behaviors and skill development) are theorized to influence the development of ER competencies through reductions in child negative arousal, which creates a scaffolded and calm space for an aroused child to practice regulating their emotions, behaviors, and cognitions (Speidel et al., 2020). On the other hand, caregiver responses to child emotions or behaviors that are hostile, punitive, emotionally overreactive, or dismissive are thought to exacerbate child negative arousal in these moments, leading to less fruitful opportunities to develop ER skills, and increasing child behavioral difficulties over time (Eisenberg, 2020). Repeated negative emotional exchanges over days and years may result in children having unpredictable, inconsistent, and maladaptive ways of experiencing and responding to their emotions (Sanders et al., 2015).

Cross-sectional and longitudinal research support associations between caregiver ERSBs and child SR and ER development in both typically-developing and clinical samples of children (Lunkenheimer, 2007; Kochanska , 2015). A 2006 meta-analysis by Karreman et al., found that, across 41 studies, there were significant positive associations between caregiver's limit setting, guidance, and positively framed directions ("positive control") and child SR, and negative associations between criticism, intrusiveness, and anger ("negative control") and SR in samples of 2-5 year old children (Karreman et al., 2006). Despite individual studies documenting significant associations between caregiver positive and negative control and ER in preschool (e.g., Feldman & Klein, 2003; Putnam et al., 2002), when ER components were isolated from SR in the meta-analyses, associations between caregiving behaviors and child ER did not reach significance. The authors theorized this pattern was a result of the young age of the children in the sample, and the fact that non-ER facets of SR (e.g., compliance, inhibition) are thought to be precursor skills which lay the foundation for ER development. More recent studies in racially and socioeconomically diverse sample of preschool children, however, *have* documented significant associations between a range of caregiver behaviors and teacher-reported child ER in preschool (e.g., Caiozzo et al., 2018; Qiu et al., 2022). Despite some inconsistency, the extant literature on preschool SR development consistently points to ERSBs as a compelling target with potential to meaningfully support and alter early ER development trajectories in early childhood.

Preschool Emotional Lability

Emotional lability has emerged as a particularly compelling aspect of development to understand about increasing the specificity of ERSB- and caregiver-mediated intervention training in preschool. Emotional lability and ER are distinct but tightly intertwined constructs (Oattes et al., 2018). Emotional lability is described as rapid and/or intense pattern of emotional variation resulting from an inability to sustain a consistent emotional state over time (Gross, 2007), and is strongly associated with anxiety, attention difficulties, child aggression and bullying behavior, social difficulties, and parenting stress when measured in childhood (Walerius et al., 2014). Emotional lability is furthermore characterized by strong arousal responses to both negative and positive emotions (Dunsmore et al., 2013). Given that emotionally labile children experience emotional shifts in intense and sudden ways, it is somewhat unsurprising that lability and ER have been found to be inversely associated, such that high emotional lability is linked with greater difficulty regulating emotions (Kim-Spoon et al., 2013). The unfortunate paradox is that, while strong emotional lability requires development of equally strong ER skills, calm and fruitful opportunities to develop ER skills may be fewer and farer between for children who are highly reactive, and thus elicit frequent and strong reactivity from their environments.

Notably, research suggests that negative parenting behavior may have greater impact on the self-regulation development in cohorts of emotionally dysregulated preschool-aged children (Morris et al., 2007). Children with early ER difficulties may be particularly sensitive to overly harsh, controlling, or permissive parenting (Morris et al., 2017). In a study of preschool-aged children, caregiver psychological control was more strongly related to externalizing and internalizing behaviors in a subset of children with strong negative reactivity (Morris et al., 2002). Additionally, longitudinal studies of school-aged children have identified supportive caregiving behaviors as a significant developmental protective factor in children with higher levels of emotional dysregulation at baseline. One study of children (M = 10.67 years) with diagnosed ADHD, a neurodevelopmental disorder with emotional reactivity as a foundational symptom, found that children high on emotional lability were more susceptible to both supportive and non-supportive emotion socialization practices (Breaux et al., 2017). One theory to explain differential responses to ERSBs in more emotionally reactive children draws from the literature on individual differences in behavioral, physiological, and genetic sensitivity to environmental stimuli, such that individuals with a strong predisposition towards strong emotional reactivity would similarly be more sensitive to social stimuli (Obradović and Boyce, 2009). For these reasons, considering baseline levels of child emotional reactivity and sensitivity is especially relevant to understanding how to support caregiver management behaviors and ERSB use.

Given the strong impact of ERSBs on preschool ER, and of preschool ER skills on lifespan outcomes, surprisingly few studies have focused on identifying barriers and facilitators to a caregiver's implementation of ERSBs with fidelity, in the context of responding to children across the spectrum of emotional reactivity in preschool. These are important gaps for two main reasons. First, parent training literature has identified baseline child emotional and behavioral difficulty as an important predictor of the overall effectiveness of caregiver-mediated behavioral interventions on preschool ER outcomes (Leineman, 2020; Lundahl et al., 2006). This may be due to the frequency and intensity of caregiving contexts in which caregivers of children with difficult emotions and behaviors must implement the ERSB skills they learn through intervention. Caregiving children higher on emotional reactivity may thus require higher levels of stamina and skill fluency to manage more reactive and unpredictable emotions and behaviors. Second, caregiver mental health and emotion management are consistently implicated as a barrier to effective parent behavioral training engagement, implementation of learned behaviors, and attrition (Ludmer et al., 2017; Leineman, 2020). Caregivers of children with more labile emotions are at increased likelihood of experiencing their own internalizing symptoms and emotion dysregulation, both due to biological (e.g., heritable aspects of temperament) and environmental risk factors (e.g., child behavior evoking less sensitive caregiving responses over time). Given that caregivers of children with more difficult emotions may benefit most from effective parenting tools and are also at increased risk of difficulties acquiring and implementing tools learned through intervention, it is especially critical to pinpoint successful behavioral characteristics of caregivers who experience consistent daily success with implementing ERSBs across the spectrum child emotional reactivity.

Caregiver Emotion Regulation

A central aspect of the parenting experience is thus successful regulation of a caregiver's own emotions in daily life, which is a complicated, multi-faceted task (e.g., Bonanno & Burton, 2013; Webb et al., 2012). While parenting preschool-aged children, caregivers must respond sensitively to the emotional needs of a young child with limited regulatory capacities, while simultaneously managing their own emotional reactions and experiences. Emerging literature increasingly documents the impact of parent ER difficulties on parent stress and well-being, positive parenting behaviors, and parenting self-efficacy (Qiu et al., 2022; Hajal & Paley, 2020). The complexity of caregiver-child regulatory interactions, and implications for immediate and prospective parent and child mental and emotional health, incited calls for more research to better understand parent ER in the context of caregiving 30 years ago (Dix, 1991). However, in 2022, despite an abundance of research documenting associations between caregiving behaviors and child SR and ER development, the field continues to lack a body of research exploring the processes by which a caregiver's own ER strategies influence ERSBs and other caregiving behaviors.

Currently, the limited body of research that explores caregiver ER strategy use in the parenting context draws from Gross and Thompson's (2007) process model of emotion regulation, due to the extensive body of research which applies the model to adult populations, and thus provides a strong theoretical foundation to generate caregiving-related hypotheses (Lorber et al., 2012). The present study defined both ER and ERSBs in the context of the process model to maintain theoretical consistency in our characterization of caregiver (ER) and child (ERSB) regulation of emotions. The process model of emotion regulation outlines five families of ER strategies: 1) Situation selection includes *avoidance* of initial engagement with an emotion eliciting event altogether (e.g., ER: avoiding taking the family to a particular public place; ERSB: not bringing child into a room with their broken toy), while the remaining for strategies describe ways to respond to emotional events once they have already occurred. For instance, strategies within the 2) situation modification family include taking action to change an emotionally eliciting situation once already engaged (e.g., ER: turning off the TV during an upsetting news story; ERSB: handing a child a comfort item when they seem worried). The 3) attentional deployment family includes *distracting* oneself from an emotion eliciting situation (e.g., ER: attending to chores; ERSB: handing a child a tablet to stop their crying) or *ruminating* on an emotion eliciting stimuli by recurrently directing attention towards the causes and consequences of emotion (e.g., ER: continually replaying a distressing conversation in your head). Within the 4) cognitive change family, ER strategies include *cognitive reappraisal* of the emotional event, otherwise described as reinterpreting the situation and / or goals (e.g., ER: thinking about a time you have successfully overcome the emotion in the past; ERSB: provides reasons *why* child has to wait for candy), or *acceptance* of the emotion with nonevaluative judgement (e.g., ER: taking time to cry, feel pride, feel anger, etc., and letting it subside naturally without attempting to move on quickly; ERSB: telling child it's normal to feel the emotion). Lastly, the 5) response modulation family of strategies refers to changing emotional expression, such as *suppression* of outward expressions of emotion (e.g., ER: smiling to express happiness, when internally feeling anger towards family member; ERSB: telling child to stop crying).

Caregiver ER and ERSBs

There is thus growing understanding that the execution of positive caregiving behaviors–which provide children with advantageous opportunities to practice regulation–require that a caregiver can flexibly modulate and maintain their own emotional states amid caring for a dysregulated and distressed child. For this reason, a proliferation of theory and models have emerged with aims to conceptualize the complex relationships between emotion, regulation, parenting, and child development (e.g., Bariola et al., 2011; Bridgett et al., 2015; Dix, 1991; Hollenstein et al., 2017; Laurent, 2014; Morris et al., 2017; Schwartz et al., 2012; Yap et al., 2007). The model by Morris et al. (2007) is particularly well known and referenced and outlines a pathway through which parents shape their child's ER skills and lability through parenting behavior, modeling, observation, and family emotional climate. Overall, the models share the foundational understanding that parents influence the emotional development of their children through both direct (e.g., 'positive' responses to child emotions) and indirect (e.g., modeling of emotional experiences and ER) means, both of which require that a caregiver successfully manages their own emotions through ER. Parent ER has furthermore grown to be a prominent aspect in more recent caregiver ERSB and ER development models (e.g., Leerkes & Augustine, 2019; Shaffer & Obradovic, 2017).

There is uncertainty in the current literature regarding which aspects of caregiver ER impact on ERSBs and child outcomes in meaningful ways. Zimmer-Gembeck et al. (2021)

recently conducted a meta-analytic review of 53 studies on the relationships between parent ER, ERSBs, and child ER. Based on their review, most of the research has tested two dimensions of caregiver ER as predictors of ERSBs and child ER: “difficulties with ER,” and “ER skills” (e.g., specific ER strategies including emotional suppression, cognitive reappraisal). The dependent outcomes were most often conceptualized as “positive” and / or “negative” parenting or ERSB behaviors, and were primarily measured through global self-report, with some based on observation in a lab setting. Analysis of the outcomes overall yielded strong effect sizes between parent ER difficulties with negative parenting behaviors, and between parent ER difficulties and child internalizing and externalizing behavior. There was not a significant association between ER difficulties and positive parenting behaviors, however, suggesting that, while difficulties with ER may not impact a parent’s ability to respond positively, they may increase the likelihood of negative responses to child emotions across contexts.

Somewhat fewer of the studies focused on specific ER strategies, compared to measures of caregiver ER difficulties globally (Zimmer-Gembeck et al., 2021). Research which has considered ER strategies yields highly inconsistent results thus far, which may be reflective of the lack of contextual sensitivity in measurement, and a paucity of studies to draw from in general. Most studies have focused on *expressive suppression* and *cognitive reappraisal* in relation to ERSBs. Zimmer-Gembeck et al. (2021) reported inconsistent associations between expressive suppression, cognitive reappraisal, and ERSBs. While parent cognitive reappraisal had a significant effect on child internalizing behaviors, neither ER skill demonstrated significant impacts on child externalizing behavior. The authors noted inadequate power due to the small number of samples which have explored specific parent ER strategies (N = 5, out of total of N =

53) as a major limitation of these analyses compared to analyses looking at ER difficulties as a broad construct.

Other studies have documented significant associations between caregiver ER strategies and ERSBs patterns, however. A different study exploring the role of maternal ER in the context of discipline encounters found strong associations between parent expressive suppression, cognitive reappraisal, and ERSBs, when examined in the context of discipline characterized by overreactive caregiver emotions and behaviors, or inadequately firm, or "lax" caregiving behaviors (Lorber et al., 2013). A parent's global reports of reappraisal use, in addition to reappraisal in the context of discipline, were both associated with lax and overreactive discipline practices. Parent expressive suppression use was associated with lax and overreactive discipline *only* in the context of discipline encounters, however, and did not predict ERSBs when measured using global parent report measures. These findings speak to the context-specificity of measuring and understanding the impacts of parent ER on ERSBs. ER strategies which overall yield inconsistent or null associations with ERSBs when measured on a global scale, may hold new and important meaning when measured in ways that account for context and situation. The inconsistencies in caregiver ER and ERSB research underscores the need for studies seeking to clarify the impact of caregiver ER strategies in context, to enrich our understanding of a strategy's overall usefulness of explicit ER training in caregiver-mediated intervention framework to meaningful outcomes in daily life.

Caregiver ER and ERSB Success

Beyond documenting associations between ER strategies and ERSB use, however, to more fully understand how to support caregivers in meeting child emotion management goals and guiding socially valid interventions, it is important to likewise quantify the perceived effectiveness of a caregiver's ER and ERSB usage within their daily context. *ER success* is defined as "how well an individual is able to achieve his or her emotional goals while using a particular ER strategy" (McRae, 2013). *ERSB success* is a somewhat more complex construct to define. Due to a lack of research previously defining the construct, the present study defines ERSB success as how efficacious caregivers' felt in managing their child's emotions using any given combination of ERSB strategies throughout the course of a day. In other words, how successful did the caregiver perceive their socialization effort to be in the moment. It is important to note, however, that previous research suggests there may be an important difference between momentary perceptions of ERSB success, and the long-term impact of ERSB behaviors on caregiver operant learning and child emotion regulation development (Grusec, 2002). Whereas more emotionally suppressive ERSB strategies (e.g., scolding, threats) often result in immediate elimination of the child's negative behavior, and thus negative reinforcement for the caregiver which increases the likelihood of the caregiver's future use of suppressive ERSBs, in the long-term, suppressive ERSB strategies may inhibit the development of child ER, as they do not cultivate a supportive space for children to learn and practice effective emotion management skills.

Considering ER and ERSB success is important about integrating caregiving context into understanding the utility of caregiver ER and ERSB strategies. While there is strong documentation of ERSBs and ER strategies that are more positive or negative for adaptive emotional development in children and adults more generally, as demonstrated by Lorber et al., (2013), some ER and ERSB strategies which generally contribute to "negative" outcomes on a global scale may be adaptive to successfully navigating certain caregiving situations (e.g., suppressing child emotions quickly in public), or in light of certain contextual variables (e.g., caregiving an emotionally child reactive child). Therefore, measuring perceived ER and ERSB success as an outcome, in addition to discrete ER and ERSB strategies, will allow us to delineate strategies and profiles which may be uniquely reinforcing to parents in the context of managing the behavior of children with a range of emotional presentations, and thus predict future use of the socialization behavior.

Current Study

Aims and Contributions

The current study thus builds upon and extends existing understanding of caregiver ER and ERSBs by detailing various caregiver emotional management patterns which facilitate successful child socialization in daily life. This knowledge provides greater specificity regarding which features of parent emotional management to prioritize as targets of parent-mediated child ER interventions to support generalizability of caregiver ERSB success from intervention to daily life.

The present research contributes to the existing literature in a several key ways. First, this study increases the ecological validity of current caregiver ER and ERSBs understanding by assessing momentary use of ER and ERSB strategies in daily life through Ecological Momentary Assessment (EMA). Second, the present study expands beyond measurement of specific ER strategies by taking a person-centered approach to EMA data. In addition to individual ER strategies, a person-centered approach allows for observation of the number of ER strategies used by caregivers, the combinations of strategies they choose to implement over the course of a week. EMA data collection allows for the analysis of nested data, or specific measurement occasions nested within caregivers. Using nested data, the current study uses a multilevel latent class analytic (LCA) model for categorical observed variables to statistically model various caregiver profiles of momentary ER and ERSBs use, while simultaneously accounting for caregiver differences in momentary profile use across measurement occasions. Third, this study offers insight into the social validity of ER and ERSB profiles by analyzing mean differences in perceived ER and ERSB success between the latent class profiles at the between-person level. Lastly, the present study considers the role of child emotional lability as a moderator of latent ER and ERSB profiles and perceived ER and ERSB success. While ERSBs have often been studied as predictors of child lability (e.g., Rogers et al., 2015, Speidel et al., 2020), no studies to my knowledge have explored how the success of ERSBs may vary based on the child's levels of emotional regulation or lability. This is an important contribution, given recent calls from leader in the field to expand models of caregiver ERSB and child ER models by confirming key child and caregiver moderators to and from ERSBs (Eisenberg, 2020).

Research Questions

The present study specifically addresses the following research questions:

Research Question 1: Given the lack of studies on profiles of momentary ER and ERSB in daily life, the present study clarifies: (a) Which caregiver ER strategies are typically used in combination with one another in daily life (e.g., how many profiles of momentary ER strategies can be distinguished and how are they characterized?); (b) Which caregiver ERSB strategies are typically used in combination with one another in daily life (e.g., how many profiles of momentary ER strategies can be distinguished and how are they characterized?); (c) Which caregiver ER and ERSB profiles are related to one another in daily life?

Research Question 2: Given the lack of studies which explore success as an outcome of ER and ERSBs, the present study clarifies: (a) Do mean levels of ER success differ across ER profile; (b) Do mean levels of ERSB success differ across ER profiles; (c) Do mean levels of ERSB success differ across ERSBs profiles?

Research Question 3: Given lack of clarity regarding moderators of caregiver ER and ERSBs in daily life, the present study examines: (a) Are the relationships between any ER / ESRB classes and ER / ERSB success moderated by child emotional lability?

Hypotheses

Based on previous research and theory, I hypothesized the following pattern of results:

Hypothesis 1: Given previous research which demonstrates the utility of ER flexibility and repertoire in daily life (Grommisch et al., 2020), and considering the theoretical role of repertoire in broader ER processes (Gross, 2015), I expected to find variability in caregiver use of ER profiles over the week, such that some caregivers will use fewer ER strategies more consistently, and some will use a greater diversity of strategies over this. I hypothesized that ER and ERSB classes would reveal that strategies generally considered as more supportive of emotional expression in previous ER and ERSB literature (e.g., cognitive reappraisal, acceptance), would be used in combination with one another more frequently, whereas strategies generally considered as less supportive of emotional expression (e.g., expressive suppression, ignoring) would be used in combination with one another more frequently. This prediction is based on trends in previous ER and ERSB literature to characterize regulation and socialization strategies dichotomously based on their generally ‘positive’ versus ‘negative’ associations with child ER and development (e.g., Shenk & Fruzetti, 2011; Karreman et al., 2006). Lastly, I hypothesized that ER profiles comprised of strategies characterized by engagement with emotions (e.g., cognitive reappraisal, acceptance; Gross and John, 2013), would be associated with use of ERSB strategies that are more supportive of emotional expression, whereas ER profiles that are less supportive of emotional expression (e.g., expressive suppression, ignoring) would be associated with the use of ERSB strategies that are less supportive of emotional expression.

Hypothesis 2: Given the findings of previous studies which have conducted multilevel LCA with populations of non-caregivers (e.g., Grommisch et al., 2020), I hypothesized that across research questions 2 a – c, there would be a 'sweet spot' in caregiver repertoire, such that ER and ERSB profiles characterizes by moderately sized repertoire of ER and ERSB strategies (e.g., ~ between 3-4 strategies), with a mix of traditionally supportive and unsupportive ER strategies, would report the greatest mean levels of ER and ERSB success. This is based on research that links a limited repertoire of ER strategies to psychopathology (Stelzer et al., 2021). I expected that using a moderate number of strategies would be associated with greater success than a larger number of ERSB and ER strategies, given research on the importance of persistence in the face of initial negative feedback to developing healthy patterns of ER (e.g., persisting with strategies strategically given evidence and history of success in context, rather than cycling through strategies aimlessly in the face of adverse responses; Southward et al., 2018).

Hypothesis 3: Given previous research which has documented differences in the impact of ER and ERSBs in the context of specific caregiving situations (e.g., Lorber et al., 2013), as well as theory from parenting literatures regarding the importance of consistent and predictable responses when managing children with difficult emotions and behaviors (Lobo et al., 2020), I hypothesized that the associations between certain ER profiles and ERSB profiles and regulation success would be moderated by child's level of emotional lability. I specifically predicted that profiles with fewer, traditionally emotionally-supportive strategies (e.g., cognitive reappraisal, acceptance) would be more successful for children with increasing levels of emotional lability, while a more diverse emotional repertoire will be perceived as more successful for children lower on emotional lability.

CHAPTER II

METHOD

Participants

Caregiver Demographics

Participants were 197 primary caregivers (M_{age} = 34.19). Caregivers were primarily female (N = 189; 95.9%), with 7 male and 1 nonbinary participant. This sample size was determined sufficient for the current analyses given previous EMA studies with similar numbers of participants and data observations which conducted multilevel Latent Class Analyses (LCA) (Hajal et al., 2019). In the multilevel latent class modeling context, the number of participants has a greater impact on statistical power than the number of data observations (Bolger and Laurenceau, 2013). As such, a sample size of N = 180 is sufficient to detect effect sizes of *r* = .25. Other important indicators of power in multilevel latent analyses include class separation and number of indicators, which I assessed and reported for each model.

Educational attainment of caregivers varied, with 23 (11.7%) having a high school degree, 27 (13.7%) having an associate degree, 50 (25.4%) having a masters or professional degree, 9 (4.6%) having a doctorate, and 6 (3%) indicating having a certificate or "other." The sample included a diverse range of incomes, with a mean of $111,208 and a range of $900 to $500,000 per year (as compared to median US income in 2020 of $67,521) (US census Bureau, 2021). Regarding financial stress, 71 (36%) indicated having no financial stress, 65 (32.9%) indicated some financial stress, and 61 (30.9%) indicated high financial stress. Most caregivers (N = 88, 44.7%) reported being home full time with their child, while 38 (19.3%) reported working part-time outside the home, and 68 (34.5%) reported working full-time outside the home. The sample was primarily married (N = 171, 86%), identified as White (N = 162, 82.2%), and non-Hispanic (N = 162, 82.2%) (as compared to 57.8% of US sample in 2020 identifying as white and non-Hispanic). Most participants (N = 186, 94.4%) indicated being mothers, with 7 identifying as fathers, and 2 identifying as biological and adopted grandparents, respectively. Regarding social support, mean number of close family contacts was 3.99. See Table 1 for more details on caregiver demographics.

Table 1.

Caregiver Demographics

	N	Percent	Mean	SD	Min	Max
Age	197		34.19	5.69	23	65
Gender						
Female	189	95.9%				
Male	7	3.5%				
Non-binary / Gender Fluid	1	0.5%				
Education						
High School Degree	23	11.7%				
Associate degree	27	13.7%				
Master's / Professional degree	50	25.4%				
Doctorate	9	4.6%				
Certificate / other	6	3%				
Income	193		$111,208	$82,689	$900	$500,000
Financial Stress						
No	71	36%				
Somewhat	65	32.9%				
Yes	61	30.9%				
Time working						
Home full time with child	88	44.7%				
Working part time	38	19.3%				
Working full time	68	34.5%				
Retired	1	0.5%				
Unemployed / looking for work	2	1.0%				
Relationship status						
Married	171	86%				
Cohabitating	9	46%				
Separated	6	3%				
Divorced	5	2.5%				
Single	6	3%				
Cohabitating with partner?						
Yes	181	91.8%				
No	16	8.2%				

Table 1, continued

	N	Percent	Mean	SD	Min	Max
Race						
White	162	82.2%				
Black	13	6.6%				
Asian	6	3%				
Native American	1	0.5%				
Biracial	7	3.5%				
Latinx	1	0.5%				
Other	7	3.5%				
Ethnicity						
Hispanic	35	17.7%				
Non-Hispanic	162	82.2%				
Relationship to child						
Mother	186	94.4%				
Father	7	3.5%				
Adoptive Mother	1	0.5%				
Grandparent	1	0.5%				
Adoptive Grandparent	1	0.5%				
Number of close family contacts			3.99	4.84	0	50

Child Demographics

See Table 2 for child demographics. Target children included 197 preschool-aged kids with a mean age of 3.1 years. Most children fell between ages 18 months – 4 years, with 51 (25.9%) reported as ages 1 or 2, 70 (35.5%) age 3, and 44 (22.3%) age 4. An additional 20 (10% of sample) children were identified as age 5. Of the sample, 84 (42.4%) were identified by the primary caregiver as female, 107 (54.0%) were identified as male, 1 (0.01%) was identified as non-binary, and 2 (0.01%) caregivers declined to provide the gender identity of their child. Most children were identified as White (N = 162, 82.2%), followed by Black (N = 13, 6.6%), Asian (N = 6, 3%), Biracial (N = 7, 3.5%), Native American (N = 1, 0.5%), Latinx (N = 1, 0.5%), and Other (N = 7, 3.5%). Most of the sample were identified as non-Hispanic (N = 162, 82.2%), while 35 (17.7%) identified as Hispanic. These demographic characteristics provide important information about the diversity of the sample and will be considered in the interpretation of study results.

Table 2.

Child Demographics

	N	Percent
Gender		
Female	84	42.4%
Male	107	54.0%
Non-Binary / Gender Fluid	1	0.01%
Prefer no answer	2	0.01%
Race		
White	162	82.2%
Black	13	6.6%
Asian	6	3%
Native American	1	0.5%
Biracial	7	3.5%
Latinx	1	0.5%
Other	7	3.5%
Ethnicity		
Hispanic	35	17.7%
Non-Hispanic	162	82.2%

Recruitment

Recruitment took place through social media advertisements (Instagram), direct outreach to parenting groups and community organizations through email and social media, and snowball recruitment. Study participation was open to all primary caretakers or young children (e.g., mothers, fathers, grandparents, other kinds of kin care, etc.). To be eligible, participants need to (a) have had 50% custody for the last 12 months of a child between the ages of 18 months and 5 years, (b) be fluent in English.

Procedure

All study activities took place remotely, to increase access to participation to individuals from diverse geographic locations within the United States. Participants completed a “application survey" to ensure eligibility. The application explained eligibility criteria, study procedures and compensation, and required participants to provide an electronic signature to consent to the study purpose, duration, risks, benefits, alternatives to participation, and compensation. Full participation consisted of completing an intake survey (~30 minutes, included demographic information and additional surveys not included in the scope of this dissertation), up to 21 daily emotion check-in surveys (~2 minutes each) received to their mobile devices via SMS three times daily for seven days, and an optional 2-minute follow-up reflection survey. Daily emotion check-ins were delivered each day at 11am, 3pm, and 7pm local time. To earn compensation for each check-in, participants were instructed that they needed to complete the survey within 1 hour of when it was received. Prior to participation in the daily check-ins, participants were emailed an instructional video and flier outlining completion of the emotion check-ins and compensation procedures and instructed to reach out by email or social media with questions. Participants were reimbursed up to $56, contingent upon their EMA compliance and completion.

Measures

Caregiver Emotion Regulation (ER)

At each emotion check-in survey (N = 21), participants were asked to indicate their strongest emotional experience in the past four hours from a list of 19 common emotion words (joyful, angry, accomplished, irritable, grateful, worried, content, stressed, strong, sad, proud, lonely, interested, hopeless, excited, guilty, attentive, frustrated, empty; Kerr et al, 2021). They were then asked to report how they responded to that peak emotional experience, by selecting as many strategies as they wanted from a list of 11 ER strategies. Eight ER strategies were included to align with stages of Gross' (2015) process model of ER, and included cognitive reappraisal ("I took a step back and changed the way I was thinking about the situation"), response modulation (expressive suppression: "I hid my emotions from others" and social sharing: "I shared the emotion with others"), situation modification ("I physically changed the situation (e.g., I changed location)", three types of attentional deployment (i.e., avoidant distraction: "I attended to other responsibilities (e.g., doing the dishes, laundry);" positive distraction: "I tried to do something pleasant (e.g., watched favorite show, take a bubble bath);" and rumination: "I thought about the emotion over and over"). In addition, we included two strategies which emerge frequently across ER literature but are not encompassed by in Gross' process model, which were acceptance ("I accepted the emotion") and ignoring ("I ignored the emotion"); Grommisch et al., 2020. We lastly included an item to capture a lack of ER strategy usage, which was no regulation ("I did not try to change the emotion").

Emotion Regulatory Socialization Behaviors (ERSBs)

In addition, participants were asked to indicate the strongest emotional experience felt by their *child* in the past four hours, from the same list of 19 common emotion words (Kerr et al., 2021) provided to capture their own emotions. Caregivers were then asked to report how they responded to their child's peak emotional experience, by selecting as many strategies as they wanted from a list of 10 ERSB strategies. Caregivers had the option to indicate if they were not with their child and forego the ERSB questions. We chose to align ERSB strategies with the ER strategies for conceptual consistency and alignment. ER strategies included cognitive reappraisal ("Offered them other ways to interpret the situation (e.g., "explained reasoning, etc."), response modulation (expressive suppression: "I verbally encouraged them to change their emotion (e.g., "don't cry")" and social sharing: "I encouraged them to share how they were feeling (e.g., "tell me more")), situation modification ("I physically changed the situation (e.g., hid broken toy so they couldn't see it, removed child from environment)"), two types of attentional deployment (i.e., avoidant distraction: "I encouraged them to do something more productive (e.g., pick up toys);" positive distraction: "I tried to do something pleasant I encouraged them to do something pleasant (e.g., watch cartoons)"); emotional acceptance ("I expressed that it was OK to feel their emotion") and ignoring ("I ignored their behavior or feelings"); and no regulation ("I did not try to change their emotion"). Rumination was not included as an ERSB strategy, due to lack of empirical support for this as a common regulatory approach for managing child emotions.

ER Success

After indicating which strategies they used to regulate their emotion, caregivers responded to a question which asked, "how successful do you think your response was?" on a 7-point Likert scale ranging from *Unsuccessful* to *Very Successful.* In the instructional video, participants were asked to consider how successful they were in managing their emotion using the previously indicated ER strategy.

ERSB Success

After indicating which ERSB strategies they used to regulate their child's emotion, caregivers responded to another question which asked, "how successful do you think your response was?" on a 7-point Likert scale ranging from *Unsuccessful* to *Very Successful.* In the instructional video, participants were asked to consider how successful they were in managing their child's emotion using the previously indicated ERSB strategy.

Child Emotional Lability

Historically, emotional lability has been measured by retrospective caregiver report or laboratory measures (Porges et al. 1994; Shields & Cicchetti 1997). However, recent research has turned towards use of dynamic measurement to encapsulate child emotion dysregulation with greater ecological validity (Slaughter et al., 2020). One way to capture emotional lability in ecologically valid ways is by collecting using repeated reports of affective valence and intensity as they naturally fluctuate in daily life (Rusell & Gajos, 2020). Caregivers were asked to report the intensity of their child's current emotional experience at each time point, on a 6-point Likert scale ranging from *Very Negative* to *Very Positive*. Temporality of emotion changes was captured by (a) taking the difference between successive within-day rating points (i.e., between morning to afternoon, afternoon to evening), (b) squaring each within-day difference score, and (c) taking the average of the within-day squared difference score across all days in which EMA ratings were provided. This process is referred to as Mean Squared Successive Difference (MSSD) and has been implemented to obtain ecologically valid emotion lability measures in previous EMA studies (e.g., Walerius, 2016, Van Beveren, et al., 2019).

For descriptive analysis purposes, lability groups were made based on resulting MSSD lability scores to group children across the spectrum of emotional lability (e.g., high, medium, low lability groups).

Analyses

Caregiver-reported family income and child gender and age were collected as part of the application survey. Caregiver income was included as a covariate given the variable's strong association with parenting behaviors in previous research (Lansford et al., 2004). Child age and caregiver-reported child gender (referred to as "child gender" from here on) were included as control variables given their documented implications for emotion regulation development (Montroy et al., 2016). Caregiver work status was assessed at intake (e.g., work full-time, work part-time, home full-time). Caregiver time working was included as a categorical covariate to assess relationship with LCA class membership to control for any affect the time caregivers spent with their child might have on survey compliance and responses. This variable was not included as a covariate in research questions 1 – 3 to maintain model parsimony, given that there was no significant association between work status and regulation success. EMA compliance (e.g., total percent of timepoints completed during the week) was included as a covariate in all models due to variability in caregiver survey noncompliance. Compliance is commonly used as a covariate in EMA research involving children and adolescents for the purposes of accounting for bias in survey completion (Wen et al., 2017).

Descriptive Analyses

Descriptive analyses were run to survey the relationship between relevant covariates (e.g., child age, child gender, SES, time spent with child) and constructs of interest to the study (e.g., regulation frequency, regulation strategies used, emotions experienced, regulation success, child lability, and regulation success), and provide context for the study's findings. Although child behavioral difficulty was not a primary construct in the present study, child behavioral difficulty profiles of the sample were detailed in relation to variables in interest, given the relevance of child behavioral difficulty to parenting behaviors in the parenting and behavior management literature (Bolger et al., 1995). Detailing the child difficulty profiles of the present sample is important in providing context for the caregiver regulation and socialization profiles being characterized by this research.

Categorical variables were made for some demographics of interest for the purpose of descriptive observations. Parent income was coded as a categorical variable with four levels: $900 – 50,000, $50,000 – 80,000, $80,000 - 140,000, and $140,000+. Income cutoffs were chosen based on groups which would ensure a relatively equal number of participants in each group. Lability scores were divided into groups ranging from no lability (MSSD = 0), low lability (MSSD = 0–1), medium lability (MSSD = 1–2), medium / high lability (MSSD = 2–3), and high lability (MSSD = 3–8.06). While other studies have used MSSD to quantify emotional lability in EMA studies (see Houben et al., 2015 for meta-analyses), MSSD scores vary across studies based on the methods of data collection. Thus, due to lack of existing literature as guidance, lability category cutoffs were grouped in increments of 1 point, with the high lability group including a much wider range of scores given low sample size. Regulation success (ER and ERSB) were divided into three groups based on Likert scale success ratings: low success (ratings of 1–2), medium success (ratings of 3–4), high success (ratings of 5–6). Caregiver work status (e.g., work full-time, work part-time, work full-time), was used as a measure of time spent with child in descriptive analyses, given lack of other available variables to capture this construct.

For descriptive analyses with continuous outcomes (e.g., behavioral difficulty, number of strategies, regulation success, child emotional lability), I ran one-way ANOVAS followed by Tukey's honest significance test to test for mean differences with Holm correction for multiple comparisons. For descriptive analyses between categorical variables (e.g., income, age group, caregiver time at home, child identified gender, discrete emotions), I ran Pearson's chi-squared tests of independence with Yate's continuity correction followed by pairwise proportion tests with Bonferroni correction for multiple comparisons. Significant mean differences for ANOVAs and Chi-Squared analyses are indicated in tables with superscripts.

Research Question 1

To address research question 1 and 2, I implemented the standard three-step approach with maximum likelihood estimation and modal class assignment to latent class membership to other variables, as outlined Bakk et al., (2013). The first step includes fitting a measurement model to identify latent profiles of ER (question 1a) and ERSB (question 1b) strategies used by caregivers in daily life. The second step involves assigning participants to latent classes based on their posterior probability of being in the class given their pattern of responses on categorical indicator variables (i.e., ER or ERSB strategies) at each timepoint (Muthén & Muthén, 2000). Caregivers were assigned to clusters in which their posterior probability of membership was greater than 0.80, given guidance from Weller et al., (2020) that posterior probabilities closer to 1.00 are desirable, between 0.80 – 0.90 are acceptable, and below 0.80 are unacceptable (as cited by B. O. Muthén & Muthén, 2000). Caregivers whose posterior probability were less than 0.80 were sorted into their own ER and ERSB clusters labeled "no ER / ERSB cluster." The third step involves using participant's assigned latent class in further regression or mean difference analyses to test their relationship with external variables of interest and covariates. This approach has been used by recent peer reviewed multi-level LCA articles (e.g., Allison et al., 2016, Choi et al., 2021)

To identify clusters of ER and ERSB strategy use at the caregiver level, I first estimated latent profiles of caregiver ER and ERSB strategy use at the measurement occasion level, ignoring the multilevel data structure. To determine the optimal number of occasion-level classes, I compared models with using a number of statistical fit criteria, including the Bayesian Information Criterion (BIC; Killian et al., 2019), which is considered to be the most reliable indicator of LCA model fit (Vermunt, 2002), as well as the Akaike information criterion (AIC). Lower BIC and AIC indicate a better model fit. Based on the number of latent classes found in past research exploring latent ER profiles in daily life (Hajal et al., 2019; Grommisch et al., 2020), I began with a 2 latent class model, and from there compared to models with 3, 4 and 5 factors. I reported the average latent class posterior probability, or the average probability of the chosen latent model in accurately predicting the probability of class membership for individuals.

Probabilities great than .80 are considered acceptable (Weden & Zabin, 2005). I also reported entropy (Wang et al., 2017), which is an indicator of how accurately the model defines classes. Entropy scores higher than .80 are generally considered acceptable, although there is no clear cut-off point (Muthén, 2008). There are suggestions in the extant LCA literature that G-squared and p-value statistics are not meaningful in LCA when the sample is large, and the Bayesian Information Criterion (BIC) or Akaike Information Criterion (AIC) should be used to determine optimal group size instead (Nylund-Gibson & Choi, 2018).

Once the optimal number of ER and ERSB classes were identified at the measurement occasion level, I then followed the steps outlined above to identify profiles of strategy use at the caregiver level. In step two, the number of classes were fixed to the best fitting number of classes determined in step one, while number of models with 2, 3, 4, and 5 clusters (e.g., caregiver-level profiles of class use) were again compared using AIC, BIC, and entropy. LCA analyses were run using the *glca* package in R (Kim et al., 2022).

To answer research question 1c (how ER classes are related to ERSB classes), I ran a binary logistic regression using the latent variables. Predictors in the model were the latent ER classes determined by research question 1a, and the outcome variables were the 10 individual ERSB strategies. These analyses allow me to determine the probability of each ERSB behavior being present at each timepoint given the caregiver's latent ER class. To prepare data for these analyses, latent ER profiles and ERSB behaviors were dummy coded into binary variables. Latent predictors were added to the model in a stepwise fashion, with the reference group being a latent ER class hypothesized to yield the greatest ER and ERSB success.

Research Question 2

To test for mean differences in caregiver perceived ER and ERSB regulation success between caregiver ER and ERSB clusters, I first ran a one-way ANOVA between ER and ERSB categorical cluster variables and continuous ER and ERSB success outcome. Pairwise multiple comparison correction were run between groups to determine differences between groups.

To determine how caregiver ER and ERSB clusters predicted caregiver perceived regulation success, I ran linear regressions between categorical caregiver ER and ERSB clusters and ER and ERSB success. Specifically, models were run between (1) ER clusters and ER success, (2) ER clusters and ERSB success, and (3) ERSB cluster and ERSB success. Regression models controlled for child age, child identified gender, income, and survey compliance.

Research Question 3

Mean Squared Successive Difference (MSSD) was calculated to obtain a score of emotional lability for each child at the individual caregiver level over the course of the week. To determine whether the association between ER and ERSB profiles and ER and ERSB success was moderated by child emotional lability, I ran another series of latent regression models. First, I identified significant associations between ER / ERSB latent classes and ER / ERSB success found in research question 2. Next, child lability was added as an interaction term in the success models described in research question 2.

CHAPTER III

RESULTS

Data Cleaning

Missing Data

See Table 3 for summary of EMA survey compliance. Overall, participants completed 2938 of 4134 (71%) of total possible EMA surveys. Most caregivers had either excellent compliance (e.g., more than 90% of check-ins completed; N = 71, 35.8%), or inadequate compliance (e.g., less than 75% of check-ins completed; N = 72, 36.3%). Of the sample, 31 (15.6%), caregivers had adequate compliance (e.g., completed between 75 – 90% of check-ins, and 21 (10.6%) had very poor compliance (e.g., less than 20% of check-ins completed).

Table 3.

EMA Survey Compliance

	N	% of sample
Excellent compliance (>90% check ins completed)	71	35.8%
Adequate compliance (75%-90% of check ins completed)	31	15.6%
Inadequate compliance (<75% of check-ins completed)	72	36.3%
Very poor compliance (< 20% of check-ins completed)	21	10.6%
OVERALL COMPLIANCE OF SAMPLE	71% (2938 of 4134 total possible timepoints completed)	

Excluded Data

There were 34 observations completed outside of the expected data window and were removed (this did not exclude any participants, only some observations for some participants).

63 observations suggested evidence of backfilling (were completed within 1 hour of the previous check-in) and were removed. This removed 1-4 data points for 41 participants.

Descriptive Analyses

Child Behavioral Difficulty Descriptives

Child difficulty means across demographic categories are presented in Table 4. Overall, caregivers reported relatively low levels of child behavioral difficulty across measurement occasions, with 1070 of 2938 timepoints (27.2%) having child behavioral difficulty ratings of 1 (on Likert scale of 1-6, where 1 = not at all difficult and 6 = very difficult) (See Appendix A for survey items). The mean child difficulty rating across timepoints was 2.25 (SD = 2.30). One-way ANOVAs with Tukey mean comparisons were run between child behavioral difficulty and SES, time caregiver spends with child during the day, child age, child gender identity, regulation success (ER and ERSB), and child lability groups. Significant group differences are reported below; all other differences were not significant at $p < .05$.

Table 4.

Child Behavioral Difficulty Descriptives

	n	*M*	Median	SD	Min	Max
Difficulty overall	2938	2.25	2.30	2.00	1.00	6.00
Income						
$900 – 50,000	464	2.50[a]	1.35	2.00	1.00	6.00
$50,000 – 80,000	810	2.35[b]	1.31	2.00	1.00	6.00
$80,000 - 140,000	613	2.14[abc]	1.22	2.00	1.00	6.00
$140,000+	591	2.43[c]	1.32	2.00	1.00	6.00
Income mean difference	$F(3, 2474) = 8.536, p < .001$					
Time working						
Home full time	1339	2.37	1.25	2.00	1.00	6.00
Work part time	466	2.23[a]	1.32	2.00	1.00	6.00
Work full time	705	2.43[a]	1.43	2.00	1.00	6.00
Time mean difference	$F(2, 2507) = 3.523, p < 0.030$					

Table 4, continued

	n	*M*	Median	SD	Min	Max
Child Age						
1–2	676	2.26^{ab}	1.23	2.00	1.00	6.00
3	974	2.59^{acd}	1.35	2.00	1.00	6.00
4	616	2.24^{ce}	1.30	2.00	1.00	6.00
5	295	1.99^{bde}	1.21	2.00	1.00	6.00
Age mean difference	$F(3, 2557) = 21.67, p < .001$					
Child gender						
Male	1389	2.39^{ac}	1.33	2.00	1.00	6.00
Female	1118	2.30^{b}	1.29	2.00	1.00	6.00
Non-binary	19	1.05^{cd}	0.23	1.00	1.00	2.00
Prefer no answer	35	3.00^{abd}	1.11	3.00	1.00	5.00
Gender mean difference	$F(3, 2557) = 10.33, p < .001$					
ER Success						
Low ER success	202	3.35^{ab}	1.54	3.00	1.00	6.00
Medium ER success	570	3.06^{ac}	1.30	3.00	1.00	6.00
High ER success	1627	2.00^{bc}	1.14	2.00	1.00	6.00
Mean difference	$F(2, 2162) = 289.20, p < .001$					
ERSB Success						
Low ERSB success	113	3.95^{ab}	1.40	4.00	1.00	6.00
Medium ERSB success	574	3.07^{ac}	1.30	3.00	1.00	6.00
High ERSB success	1874	2.03^{bc}	1.14	2.00	1.00	6.00
Mean difference	$F(2, 2558) = 274.9, p < .001$					
Lability						
0 (none)	267	2.05^{abcd}	1.29	2.00	1.00	6.00
0–1 (low)	1128	2.33^{a}	1.29	2.00	1.00	6.00
1–2 (medium)	661	2.39^{b}	1.28	2.00	1.00	6.00
2–3 (medium / high)	340	2.45^{c}	1.35	2.00	1.00	6.00
3–8 (high)	156	2.60^{d}	1.45	2.00	1.00	6.00
Mean difference	$F(4, 2547) = 5.686, p < .001$					

Note. Significant mean differences between categorical subgroups indicated by superscript

Income and Child Behavioral Difficulty. ANOVAs indicated significant differences between income and child behavioral difficulty ratings across measurement occasions (F (3, 2474) = 8.536, $p < .001$). Based on Tukey mean comparison analyses, caregivers in the $80,000 - 140,000 SES group indicated significantly lower child behavioral difficulty (M = 2.14) than caregivers in $900 – 50,000 group (M = 2.50), $50,000 – 80,000 group (M = 2.35), and $140,000+ group (M = 2.43).

Caregiver Time Working and Child Behavioral Difficulty. There were significant mean differences in behavioral difficulty ratings based on caregiver time spent working, $F(2, 2507) = 3.523$, $p = 0.03$. Caregivers who reported working part-time (M = 2.23) indicated significantly lower child behavioral difficulty than caregivers who reported working full-time

Child Gender and Child Behavioral Difficulty. There were no significant mean differences between children identified as male (M = 2.39) and female (M = 2.30) regarding caregiver ratings of child behavioral difficulty. There were significant differences between male and female behavioral difficulty and non-binary (M = 1.05) children, and between male and female and children whose caregivers indicated that they preferred not to report child gender (M = 3.00), $F(3, 2557) = 21.67$, $p < .001$.

Child Age and Behavioral Difficulty. There were significant mean differences in caregiver ratings of child behavioral difficulty based on child age, $F(3, 2557) = 21.67$, p < .001. Caregivers of children 5-years-old (M = 1.99) reported significantly lower child behavioral difficulty than all other ages. Caregivers of children 3 years old (M = 2.59) reported significantly higher behavioral difficulty than caregivers of children 1-2 years old (M = 2.26), 4 years old (M = 2.24), and 5 years old (M = 1.99). Regarding proportion of measurement occasions, Chi-Square comparisons indicated significant differences by age for low ($\chi^2(3, 2938) = 43.30$, $p < .001$), moderate ($\chi^2(3, 2938) = 22.10$, $p < .001$)., and high difficulty ($\chi^2(3, 2938) = 17.95$, $p < .001$). Pairwise mean comparison controlling for repeated assessment indicated that children 3 years old had a significantly higher proportion of high (10%) and medium difficulty (35%) timepoints, and significantly lower proportion of low difficulty (55%) timepoints than the other age groups (see Table 5).

Table 5.

Proportion of Child Difficulty Ratings Indicated across Measurement Occasions by Child Age

	Age 1-2 (n = 676)	Age 3 (n = 974)	Age 4 (n = 616)	Age 5 (n = 295)	*p*-value
Low difficulty	0.66[a]	0.55[abc]	0.66[b]	0.73[c]	< .001
Moderate difficulty	0.28[a]	0.35[abc]	0.27[b]	0.23[c]	< .001
High difficulty	0.06[a]	0.10[ab]	0.07	0.05[b]	< .001

Note. Significant differences in proportion of difficulty rating by age indicated by superscripts. After correcting for multiple comparisons, $\alpha = p < .004$.

Child Lability and Behavioral Difficulty. There were significant mean differences in caregiver ratings of child behavioral difficulty by child lability, $F(4, 2547) = 5.686$, $p < .001$. Child behavioral difficulty increased with increasing child lability, and children with lability scores of 0 (e.g., no lability) (M = 2.05) had significantly lower mean difficulty ratings across measurement occasions than children score 0 – 1 (M = 2.33), 1 – 2 (M = 2.39), 2 – 3 (M = 2.45), and 3 – 8 (M = 2.60).

Emotion Descriptives

The emotions caregivers indicated for themselves and their child across EMA measurement occasions are shown in Table 6. Pearson's Chi-Squared estimation with pairwise mean comparison controlling for repeated assessments were run for all emotion frequency analyses. Caregivers reported being "excited" at a significantly greater proportion of measurement occasions when they were with their child versus away from their child ($\chi^2(3, 2939) = 1623.50$, $p < .001$). There were no other significant differences in frequency of caregiver discrete emotions based on whether they were with their child at the measurement occasion. "Content" was the most frequently endorsed emotion by caregivers for themselves (37% of occasions with child, 35% of occasions away from child) and for their child (45% of occasions).

Table 6.

Proportion of Occasions Emotions were Endorsed: Caregiver With and Without Child

	Caregiver Emotions			Child emotions
	Caregiver and child together n = 2556	Caregiver and child apart n = 376	*p*-value	Caregiver and child together n = 2561
Positive valence				
Accomplished	0.12	0.12	0.39	0.02
Attentive	0.03	0.00	0.71	0.03
Content	0.37	0.35	0.47	0.45
Excited	0.02	0.00	< .001	0.06
Grateful	0.08	0.06	0.93	0.01
Interested	0.01	0.01	0.46	0.06
Joyful	0.11	0.11	0.67	0.29
Proud	0.10	0.02	0.81	0.01
Strong	0.01	0.01	1.00	0.00
Negative valence				
Angry	0.00	0.00	0.89	0.00
Empty	0.03	0.03	1.00	0.00
Frustrated	0.03	0.02	0.49	0.02
Guilty	0.01	0.00	0.47	0.00
Hopeless	0.01	0.01	1.00	0.00
Irritable	0.07	0.04	0.24	0.03
Lonely	0.01	0.01	1.00	0.00
Sad	0.02	0.01	0.42	0.02
Stressed	0.08	0.10	0.11	0.00
Worried	0.04	0.04	1.00	0.01

Note. After correcting for multiple comparisons, $\alpha = p < .0012$.

Overall, caregivers reported positively valanced emotions for themselves at 72.7% (n = 1857) of measurement occasions (negative emotion occasions: n = 802), and positively valanced emotions for their child at 92.7% (n = 2372) of measurement occasions (negative emotion occasions: n = 187) (Table 7). Of occasions with caregiver negative emotions (n = 802), the most frequently endorsed negative emotion was “stressed” (27%), followed by “irritable” (21%).

Table 7.

Percent of Measurement Occasions with Positive and Negative Emotion Valence

Parent Positive n = 1857	Parent Negative n = 704	Child Positive n = 2372	Child Negative n = 187
72.7%	27.3%	92.7%	7.3%

Caregiver Emotions by Child Age. Table 8 reports significant differences in the proportion of measurement occasions caregivers reported each emotion for themselves and their child by age of child. Regarding caregiver emotions, caregivers of children 3 and 4 years reported their own emotion as “accomplished” across significantly higher proportion of measurement occasions (10%, respectively) than caregivers of children 1-2 and 5 years (9%, respectively) ($\chi^2(3, 2938) = 8.15$, $p = .04$), although this difference was not significant after correcting for multiple comparisons. Caregivers of children 3 years reported their own emotion as “joyful” across significantly lower proportion of measurement occasions (6%) than caregivers of children of all other ages (11 – 15%) ($\chi^2(3, 2938) = 23.52$, $p < .001$). Caregivers of children 5 years reported their own emotion as “excited” across significantly lower proportion of measurement occasions (0%) than caregivers of children 4 years (4%) ($\chi^2(3, 2938) = 446.83$, $p < .001$).

Table 8.

Proportion of Measurement Occasions Emotions were Indicated by Child Age

	Child Emotions by Child Age				
	1-2 n = 676	3 n = 974	4 n = 616	5 n = 295	*p*-value
Pos. valence					
Accomplished	0.01[a]	0.02	0.03[a]	0.03	0.03
Attentive	0.02	0.02	0.03	0.04	0.14
Content	0.49[ac]	0.49[bd]	0.40[ab]	0.39[cd]	< .001
Excited	0.05	0.05	0.00	0.00	< .001
Grateful	0.00	0.01	0.01	0.01	0.28

Table 8, continued

Child Emotions by Child Age					
	1-2	3	4	5	*p*-value
Interested	0.06	.058	0.06	0.05	0.86
Joyful	0.27	0.28	0.30	0.34	0.13
Proud	0.01	0.00	0.01	0.02	0.04
Strong	0.00	0.00	0.01	0.01	0.05
Neg. valence					
Angry	0.01	0.00	0.00	0.00	0.62
Empty	0.00	0.00	0.00	0.00	---
Frustrated	0.02	0.02	0.02	0.00	0.17
Guilty	0.00	0.00	0.00	0.00	0.54
Hopeless	0.00	0.00	0.00	0.00	---
Irritable	0.03	0.03	0.02	0.02	0.78
Lonely	0.00	0.00	0.00	0.00	0.63
Sad	0.01	0.02	0.01	0.01	0.96
Stressed	0.00	0.00	0.00	0.00	0.62
Worried	0.00	0.01	0.00	0.01	0.45
Caregiver Emotions by Child Age					
	1-2 n = 676	3 n = 974	4 n = 616	5 n = 295	*p*-value
Pos. valence					
Accomplished	0.09	0.10	0.10	0.09	0.02
Attentive	0.03	0.16	0.16	0.05	0.23
Content	0.38	0.49	0.33	0.37	0.25
Excited	0.02	0.02	0.03	0.00	< .001
Grateful	0.07	0.06	0.07	0.06	0.67
Interested	0.01	0.01	0.02	0.01	0.29
Joyful	0.12[a]	0.06[abc]	0.11[b]	0.15[c]	< .001
Proud	0.01	0.02	0.01	0.01	0.65
Strong	0.01	0.01	0.01	0.01	0.89
Neg. valence					
Angry	0.00	0.01[a]	0.01	0.00[a]	0.01
Empty	0.03[a]	0.04[b]	0.02	0.05[ab]	0.01
Frustrated	0.03	0.03	0.03	0.05	0.66
Guilty	0.00	0.01	0.01	0.02	0.09
Hopeless	0.01	0.00	0.01	0.02	0.29
Irritable	0.05	0.07	0.06	0.01	0.47
Lonely	0.02[a]	0.01	0.00[a]	0.01	0.04
Sad	0.03	0.02	0.01	0.02	0.26
Stressed	0.05[a]	0.09[a]	0.07	0.07	0.03
Worried	0.05	0.04	0.03	0.03	0.33

Note. Significant mean differences emotions between age groups indicated by superscripts. After correcting for multiple comparisons, $\alpha = p < .001$.

Child Emotions by Child Age. There were also significant differences in the proportion of measurement occasions caregivers reported child emotions by child age. Caregivers of children 4 years reported their child's emotion as "accomplished" across a higher proportion of measurement occasions (3%) than caregivers of children 1-2 (1%) ($\chi^2(3, 2938) = 9.58$, $p = .03$), although this was not significant after correcting for multiple comparisons. Caregivers of children 4 years also reported their child's emotion as "excited" across significantly higher proportion of measurement occasions (5%) than caregivers of all other ages ($\chi^2(3, 2938) = 446.83$, $p < .001$). Caregivers of children 1 – 2 and 3 years reported their child's emotion as "content" across significantly higher proportion of measurement occasions (49%, respectively) than caregivers children ages 4 (40%) and 5 (39%) ($\chi^2(3, 2938) = 16.07$, $p = < .001$).

Caregiver Emotions by Child Gender. Table 9 reports significant differences in the proportion of measurement occasions caregivers reported each emotion for themselves by caregiver-reported gender of child. There were no significant differences in the frequency of endorsing emotions between caregivers of male and female identified children.

Caregivers who responded "decline to answer" in response to reporting their child's gender, reported their emotion as "worried" at significantly higher proportion of occasions (17%) than caregivers who reported their child's gender as female (4%) and male (3%) ($\chi^2(3, 2938) = 19.50$, $p < .001$).

Table 9.

Proportion of Measurement Occasions Emotions were Indicated by Child Gender

	Caregiver Emotions by Child Gender				
	Female n=1114	Male n=1114	Fluid n=19	Decline n=35	*p*-value
Pos. valence					
Accomplished	0.11	0.11	0.26	0.03	.05
Attentive	0.03	0.04	0.05	0.03	.94
Content	0.39	0.35	0.32	0.26	.05
Excited	0.00	0.00	0.00	0.00	---
Grateful	0.06	0.07	0.00	0.14	.12
Interested	0.01	0.01	0.05	0.00	.31
Joyful	0.09	0.10	0.16	0.03	.29
Proud	0.01	0.02	0.00	0.00	.32
Strong	0.01	0.02	0.00	0.00	.20
Neg. valence					
Angry	0.01	0.00	0.00	0.00	.75
Empty	0.03	0.03	0.00	0.00	.89
Frustrated	0.02	0.03	0.00	0.03	.38
Guilty	0.01	0.00	0.00	0.13	.05
Hopeless	0.01	0.01	0.00	0.00	.89
Irritable	0.06	0.06	0.11	0.06	.85
Lonely	0.01	0.01	0.00	0.00	.22
Sad	0.02	0.02	0.00	0.03	.71
Stressed	0.07	0.08	0.05	0.17	.14
Worried	0.04[a]	0.03[b]	0.00	0.17[ab]	< .001
	Child Emotions by Child Gender				
	Female n=1118	Male n=1389	Fluid n=19	Decline n=35	*p*-value
Pos. valence					
Accomplished	0.01	0.02	0.00	0.00	.38
Attentive	0.02	0.02	0.05	0.00	.67
Content	0.41	0.38	0.26	0.54	.02
Excited	0.00	0.00	0.00	0.00	---
Grateful	0.01	0.01	0.00	0.00	.71
Interested	0.09[a]	0.06[b]	0.05	0.20[ab]	< .001
Joyful	0.24[ad]	0.26[bc]	0.58[ab]	0.06[cd]	< .001
Proud	0.00	0.01	0.00	0.03	.34
Strong	0.00	0.00	0.00	0.00	.91
Neg. valence					
Angry	0.01	0.00	0.00	0.00	.06
Empty	0.00	0.00	0.00	0.00	---
Frustrated	0.01	0.02	0.00	0.03	.17
Guilty	0.00	0.00	0.00	0.00	.88

Table 9, continued

Child Emotions by Child Gender					
	Female n=1118	Male n=1389	Fluid n=19	Decline n=35	*p*-value
Neg. valence					
Hopeless	0.00	0.00	0.00	0.00	---
Irritable	0.16	0.20	0.00	0.06	.57
Lonely	0.00	0.00	0.00	0.00	.52
Sad	0.01	0.02	0.05	0.00	.20
Stressed	0.00	0.00	0.00	0.00	.97
Worried	0.00	0.00	0.00	0.00	.94

Note. Significant mean differences in emotions between gender groups indicated by superscripts. After correcting for multiple comparisons, $\alpha = p < .007$.

Child Emotions by Child Gender. Table 9 also reports significant differences in the proportion of measurement occasions caregivers reported each emotion for their child by caregiver-reported gender of child. There were no significant differences in the frequency of endorsing child emotions between caregivers of male and female-identified children.

Caregivers who responded “decline to answer” in response to reporting their child’s gender, reported their child’s emotion as “interested” at significantly higher proportion of occasions (20%) than caregivers who reported their child’s gender as female (9%) and male (6%) ($\chi^2(3, 2938) = 21.55$, $p < .001$). There were no significant differences in the frequency of endorsing emotions between caregivers of male and female-identified children. Caregivers who reported their child’s gender as gender fluid reported their child’s emotion as “joyful” at significantly higher proportion of occasions (58%) than caregivers who reported their child’s gender as female (24%), male (25%), and decline to answer (6%) ($\chi^2(3, 2938) = 17.11$, $p < .001$). There were no significant differences in the frequency of endorsing emotions between caregivers of male and female-identified children.

Regulation Strategy Descriptives

Number of Regulation Strategies Used. Table 10 summarizes the number of ER and ERSB strategies caregivers used at measurement occasions based on child age and reported gender, caregiver time working, emotion valence, regulation success, and child lability. Overall, caregivers reported using significantly more ER strategies to regulate their emotions at occasions when they were with their child (M = 1.80 strategies, SD = 1.12, range = 1 – 8 strategies) compared to occasions when they were away from their child (M = 1.58, SD = 0.99, range = 1 – 6 strategies). Across measurement occasions, caregivers reported using 1.91 strategies on average to regulate their child's emotions (SD = 1.30, range 1 – 8 strategies).

Table 10.

Mean number of ER and ERSB Strategies Used across Measurement Occasions

	Mean Number of ER Strategies					
	n	*M*	SD	Median	Min	Max
Caregiver with child	2556	1.80	1.12	1.00	1.00	8.00
Caregiver no child	376	1.58	0.99	1.00	1.00	6.00
Mean difference	$F(1, 2930) = 15.525, p < .001$					
Child Age						
1-2	675	1.90^{abc}	1.12	2.00	1.00	7.00
3	971	1.91^{cde}	1.17	2.00	1.00	6.00
4	615	1.64^{bd}	1.10	1.00	1.00	8.00
5	295	1.54^{ae}	0.91	1.00	1.00	5.00
Age mean difference	$F(6, 2549) = 8.31, p < .001$					
Child gender						
Male	1388	1.80^{c}	1.12	1.00	1.00	7.00
Female	1114	1.75^{b}	1.09	1.00	1.00	8.00
Non-binary	19	2.16^{a}	0.76	2.00	1.00	3.00
Prefer no answer	35	3.09^{abc}	1.52	3.00	1.00	6.00
Age mean difference	$F(3, 2552) = 16.99, p < .001$					
Time working						
Home full time	1336	1.84^{a}	1.11	1.00	1.00	7.00
Work part time	465	1.67^{ab}	1.00	1.00	1.00	6.00
Work full time	704	1.86^{b}	1.22	1.00	1.00	8.00
Time mean difference	$F(2, 2502) = 4.91, p = 0.01$					

Table 10, continued

	Mean Number of ER Strategies					
	n	*M*	SD	Median	Min	Max
Caregiver valence						
Caregiver negative	700	2.11	1.27	2.00	1.00	7.00
Caregiver positive	1856	1.68	1.04	1.00	1.00	8.00
Mean difference	$F(1, 2554) = 74.22, p < .001$					
Child valence						
Child negative	186	2.17	1.26	2.00	1.00	6.00
Child positive	2370	1.77	1.11	1.00	1.00	8.00
Mean difference	$F(1, 2554) = 22.21, p < .001$					
ER Success						
Low ER success	199	2.13^{b}	1.29	2.00	1.00	7.00
Medium ER success	569	2.02^{a}	1.19	2.00	1.00	6.00
High ER success	1626	1.63^{ab}	0.99	1.00	1.00	8.00
Mean difference	$F(2, 2158) = 48.25, p < .001$					
ERSB Success						
Low ERSB success	112	2.07^{b}	1.21	2.00	1.00	6.00
Med. ERSB success	572	2.04^{a}	1.20	2.00	1.00	6.00
High ERSB success	1872	1.71^{ab}	1.08	1.00	1.00	8.00
Mean difference	$F(2, 2553) = 22.44, p < .001$					
Lability score						
0 (none)	267	1.59^{ab}	0.98	1.00	1.00	7.00
0 -1 (low)	1125	1.75	1.09	1.00	1.00	8.00
1 -2 (medium)	661	1.90^{b}	1.12	2.00	1.00	6.00
2 – 3 (med / high)	338	1.92^{a}	1.24	1.00	1.00	7.00
3 – 8 (high)	156	1.83	1.19	1.00	1.00	6.00
Mean difference		$F(4, 2542) = 5.09, p < .001$				
	Mean Number of ERSB Strategies					
	n	*M*	SD	Median	Min	Max
Caregiver with child	2561	1.91	1.30	1.00	1.00	8.00
Caregiver no child	---	---	---	---	---	---
Mean difference	---	---	---	---	---	---
Child Age						
1-2	676	2.03^{ab}	1.35	1.00	1.00	8.00
3	974	2.13^{c}	1.39	2.00	1.00	8.00
4	616	1.66^{bcd}	1.15	1.00	1.00	8.00
5	295	1.48^{ad}	0.93	1.00	1.00	6.00
Age mean difference	$F(6, 2554) = 19.65, p < .001$					

Table 10, continued

	Mean Number of ERSB Strategies					
	n	*M*	SD	Median	Min	Max
Child gender						
Male	1389	1.95^{b}	1.30	1.00	1.00	8.00
Female	1118	1.82^{a}	1.27	1.00	1.00	8.00
Non-binary	19	2.82	1.08	3.00	1.00	4.00
Prefer no answer	35	2.89^{ab}	1.92	3.00	1.00	7.00
Age mean difference	$F(3, 2557) = 11.76, p < .001$					
Time working						
Home full time	1339	1.99^{a}	1.36	1.00	1.00	8.00
Work part time	466	1.74^{ab}	1.23	1.00	1.00	8.00
Work full time	705	1.83^{b}	1.25	1.00	1.00	8.00
Time mean difference	$F(2, 2507) = 6.55, p = 0.002$					
Caregiver valence						
Caregiver negative	704	2.08	1.38	2.00	1.00	8.00
Caregiver positive	1857	1.85	1.27	1.00	1.00	8.00
Mean difference	$F(1, 2559) = 14.94, p = .001$					
Child valence						
Child negative	187	2.50	1.63	2.00	1.00	8.00
Child positive	2374	1.87	1.26	1.00	1.00	8.00
Mean difference	$F(1, 2559) = 41.96, p < .001$					
ER Success						
Low ER success	202	2.16^{bc}	1.39	2.00	1.00	8.00
Medium ER success	570	2.44^{ac}	1.50	2.00	1.00	8.00
High ER success	1627	1.83^{ab}	1.25	1.00	1.00	8.00
Mean difference	$F(1, 2162) = 69.61, p < .001$					
ERSB Success						
Low ERSB success	113	2.57^{b}	1.67	2.00	1.00	8.00
Med. ERSB success	574	2.43^{a}	1.47	2.00	1.00	8.00
High ERSB success	1874	1.72^{ab}	1.16	1.00	1.00	8.00
Mean difference	$F(2, 2558) = 86.38, p < .001$					
Lability score						
0 (none)	267	1.58^{abcd}	0.99	1.00	1.00	7.00
0 -1 (low)	1128	1.92^{d}	1.29	1.00	1.00	8.00
1 -2 (medium)	661	2.02^{c}	1.41	1.00	1.00	8.00
2 – 3 (med / high)	340	1.92^{b}	1.32	1.00	1.00	8.00
3 – 8 (high)	156	1.94^{a}	1.26	1.00	1.00	6.00
Mean difference	$F(4, 2547) = 5.67, p < .001$					

Note. Significant mean differences between categorical subgroups indicated by superscript.

Child Age and Number of ER / ERSB Strategies. There were significant mean differences in number of strategies caregivers use to regulate their own emotions based on child age, $F(1, 2930) = 15.525$, $p < .001$. Caregivers of children 5-years-old reported significantly fewer ER strategies (M = 1.54) than caregivers of children all other ages (ages 1 – 2: M = 1.90; age 3: M = 1.91, age 4: M = 1.64). Regarding number of ERSB strategies to regulate child emotions, caregivers of children 5-years-old also reported using significantly fewer ERSB strategies (M = 1.48) than caregivers of all other ages (1 – 2: M = 1.35; 3: M = 1.39; 4: M = 1.66) ($F(6, 2554) = 19.65$, $p < .001$).

Child Gender and Number of ER Strategies. There were significant differences in the number of ER and ERSB strategies caregivers reported using by child gender. Caregivers who declined to report child gender reported using significantly more ER strategies to regulate their own emotions (M = 3.09) than caregivers who reported that their children were male (M = 1.80), female (M = 1.75), and non-binary (M = 2.16) ($F(3, 2552) = 16.99$, $p < .001$).

Child Gender and Number of ERSB Strategies. Regarding the number of ERSB strategies to caregivers used to regulate child emotions, caregivers who declined to report child gender also reported using significantly more ERSB strategies to regulate their child's emotions (M = 2.89) than caregivers who reported male (M = 1.95), female (M = 1.82), and non-binary (M = 2.82) children ($F(3, 2557) = 11.76$, $p < .001$). There were not significant differences between male and female-identified children in number of ER and ERSB strategies used.

Caregiver Time Working and Number of ER and ERSB Strategies. There were significant mean differences in number of ER and ERSB strategies used based on caregiver time spent working. Caregivers who reported working part-time indicated using significantly fewer ER strategies to regulate their own emotions (M = 1.67) at measurement occasions than caregivers who reported being home full-time (M = 1.84) and those who reported working part-time (M = 1.86), $F(2, 2502) = 4.91$, $p = 0.01$. Regarding number of ERSB strategies to regulate child emotions, caregivers who worked part-time indicated using significantly fewer ER strategies to regulate their child's emotions (M = 1.74) at measurement occasions than caregivers who were home full-time (M = 1.99) and those who worked part-time (M = 1.83), $F(2, 2507) = 6.55$, $p = 0.002$.

Caregiver and Child Emotion Valence and Number of ER Strategies. Caregivers reported using significantly more ER strategies to regulate their own emotions at occasions with negative caregiver emotions (M = 2.11) than positive caregiver emotions (M = 1.68), $F(1, 2554) = 74.22$, $p < .001$, and significantly more ER strategies to regulate their own emotions at occasions with child negative emotions (M = 2.17) than positive child emotions (M = 1.77), $F(1, 2554) = 22.21$, $p < .001$.

Caregiver and Child Emotion Valence and Number of ERSB Strategies. Regarding number of ERSB strategies used to regulate child emotions, caregivers reported using significantly more ER strategies to regulate their child's emotions at occasions when they were experiencing a negative emotion (M = 2.08) than occasions when they were experiencing a positive emotions (M = 1.85), $F(1, 2559) = 14.94$, $p = .001$, and significantly more ERSB strategies to regulate their child's emotions at occasions with child negative emotions (M = 2.50) than positive child emotions (M = 1.58), $F(1, 2559) = 41.96$, $p < .001$.

ER Success and Number of ER and ERSB Strategies. At occasions with high caregiver-perceived ER success of regulating their own emotions, caregivers reported using significantly fewer ER strategies to regulate their emotions (M = 1.63) than occasions with medium (M = 2.02) and low (M = 2.13) ER success ($F(2, 2158) = 48.25$, $p < .001$). Also, at occasions with high caregiver-perceived ER success, caregivers reported using significantly fewer ERSB strategies to regulate their child's emotions (M = 1.83), than at timepoints with medium (M = 2.44) and low (M = 2.16) ER success, $F(1, 2162) = 69.61$, $p < .001$.

ERSB Success and Number of ER and ERSB Strategies. Similarly, at occasions with high caregiver perceived ERSB success of regulating their child's emotions, caregivers reported using significantly fewer ER strategies to regulate their own emotions (M = 1.71), compared to occasions with medium (M = 2.04) and low (M = 2.07) ERSB success, $F(2, 2553) = 22.44$, $p < .001$. Also, at occasions with high caregiver perceived ERSB success of regulating their child's emotions, caregivers reported using significantly fewer ERSB strategies to regulate their child's emotions (M = 1.72), compared to occasions with medium (M = 2.43) and low (M = 2.57) ERSB success, $F(2, 2553) = 86.38$, $p < .001$.

Child Lability and Number of ER and ERSB Strategies. Lastly, there were significant differences in number of ER and ERSB strategies reported being used based on child lability group. In general, caregivers of children in the lowest and highest lability groups reported using the fewest ER and ERSB strategies, and caregivers of children in the middle lability groups reported using the greatest number of ER (M = 1.92) ($F(4, 2542) = 5.09$, $p < .001$) and ERSB (M = 2.02) ($F(4, 2547) = 5.67$, $p < .001$) regulation strategies. Caregivers of children in the no lability group used significantly fewer ER (M = 1.59) and ERSB (M = 1.58) strategies than caregivers of children in all other lability categories.

Type of Regulation Strategies Used. Table 11 shows the proportion of measurement occasions caregivers reported using each ER and ERSB strategy. The most common ER strategies caregivers reported using to regulate their own emotions at measurement occasions with their child were acceptance (36% of occasions), avoidant distraction (17% of occasions), and labeling (17% of occasions). The most common ERSB strategies caregivers reported using to regulate their child's emotions were acceptance (20% of occasions), labeling (22% of occasions), and social sharing (19% of occasions). Caregivers also reported a high frequency of "no regulation" for themselves (46% of occasions) and for their child (66% of occasions). Comparatively, at timepoints when the caregiver reported experiencing a negative emotion, caregivers indicated "no regulation" for their own emotions 15% of the time, and "no regulation" for regulating their child's emotions 58% of the time.

Table 11.

Proportion of Measurement Occasions ER and ERSBs were Used

	Proportion of Time ERs Used			Proportion of Time ERSBs Used
	Caregiver and child together n = 2556	Caregiver and child apart n = 376	*p*-value	Caregiver and child together n = 2561
Acceptance	0.36	0.32	.13	0.20
Avoidant Distract.	0.17	0.13	.04	0.10
Ignore	0.05	0.06	.44	0.02
Labeling	0.17	0.13	.06	0.22
Positive Distract.	0.08	0.05	.01	0.14
Reappraisal	0.11	0.07	.04	0.15
Situation Mod.	0.08	0.04	.03	0.09
Social Sharing	0.00	0.00	---	0.19
Suppression	0.07	0.02	< .001	0.06
Rumination	0.07	0.04	.05	---
No Regulation	0.46	0.59	< .001	0.66

After correcting for multiple comparisons, $\alpha = p < .002$.

ER and ERSB Strategy Selection by Caregiver Valence. Proportion of measurement occasions caregivers reported using each ER and ERSB regulation strategies differed significantly by caregiver and child emotion valence (see Table 12). Regarding caregiver emotion valence and ER strategies, at measurement occasions in which caregivers reported a negative emotion for themselves, caregivers more frequently reported using avoidant distraction ($\chi^2(3, 2932) = 111.85$, $p < .001$), positive distraction ($\chi^2(3, 2932) = 19.57$ $p < .001$), ignoring

($\chi^2(3, 2932) = 97.31$, $p < .001$), labeling ($\chi^2(3, 2932) = 43.13$, $p < .001$), reappraisal ($\chi^2(3, 2932) = 14.72$, $p < .001$), suppression ($\chi^2(3, 2932) = 111.89$, $p < .001$), and rumination ($\chi^2(3, 2932) = 91.62$, $p < .001$) compared to when they reported experiencing a positively-valenced emotion. There were also differences in proportion of measurement occasions ERSB strategies were endorsed by caregiver emotion valence. At measurement occasions in which caregivers reported a negative emotion for themselves, they more frequently reported regulating their child's emotions with avoidant distraction ($\chi^2(3, 2561) = 35.33$, $p < .001$), ignoring ($\chi^2(3, 2561) = 17.17$, $p < .001$), situation modification ($\chi^2(3, 2561) = 17.45$, $p < .001$), and suppression ($\chi^2(3, 2561) = 21.11$, $p < .001$) compared to when caregivers reported experiencing a positive emotion.

Table 12.

Proportion of Measurement Occasions ER and ERSBs Used by Caregiver Emotion Valence

ERSBs by Caregiver Valence			
	Caregiver positive n=1857	Caregiver Negative n=704	*p*-value
Acceptance	0.19	0.20	.70
Avoidant Distraction	0.07	0.15	< .001
Ignore	0.01	0.04	< .001
Labeling	0.22	0.24	.39
Positive Distraction	0.14	0.14	.80
Reappraisal	0.14	0.18	.01
Situation Modification	0.08	0.13	< .001
Social Sharing	0.19	0.16	.09
Suppression	0.04	0.09	< .001
No Regulation	0.69	0.58	< .001
Rumination	--	--	--
ERs by Caregiver Valence			
Acceptance	0.38	0.32	.10
Avoidant Distraction	0.12	0.30	< .001
Ignore	0.00	0.11	< .001
Labeling	0.15	0.23	< .001
Positive Distraction	0.07	0.12	< .001
Reappraisal	0.10	0.14	.004
Situation Modification	0.06	0.11	< .001
Social Sharing	0.00	0.00	---

Table 12, continued

ERs by Caregiver Valence			
Suppression	0.04	0.16	< .001
No Regulation	0.58	0.15	< .001
Rumination	0.04	0.15	< .001

ER and ERSB Strategy Selection by Child Valence. The proportion of measurement occasions caregivers reported using each ER and ERSB regulation strategies differed significantly by child emotion valence (see Table 13).

Table 13.

Proportion of Measurement Occasions ER and ERSBs Used by Child Emotion Valence

	ERSBs by Child Valence			ERs by Child Valence		
	Child positive n=2374	Child negative n=187	*p*-value	Child positive n=2370	Child negative n=186	*p*-value
Acceptance	0.19	0.32	< .001	0.36	0.36	.99
Avoidant Distract.	0.09	0.18	< .001	0.17	0.24	.90
Ignore	0.02	0.04	.15	0.05	0.06	.35
Labeling	0.21	0.36	<.001	0.17	0.22	.15
Positive Distract.	0.14	0.16	0.53	0.08	0.11	.31
Reappraisal	0.14	0.30	< .001	0.11	0.15	.12
Situation Mod.	0.08	0.20	< .001	0.07	0.12	.75
Social Sharing	0.18	0.19	.87	0.00	0.00	---
Suppression	0.05	0.11	< .001	0.07	0.13	.47
No Regulation	0.16	0.47	< .001	0.47	0.37	.05
Rumination	--	--	--	0.00	0.18	.03

Regarding ER strategy use, at measurement occasions when caregivers reported negative child emotions, caregivers were more likely to report regulating their own emotions using rumination ($\chi^2(3, 2561) = 4.32$, $p = 0.03$), although this difference was not significant after correcting for multiple comparisons. Regarding ERSB strategy use, at measurement occasions when caregivers reported a negative child emotion, caregivers were more likely to report regulating their child's emotions using acceptance ($\chi^2(3, 2561) = 17.18$, $p < .001$), avoidant distraction ($\chi^2(3, 2561) = 14.43$, $p < .001$), labeling ($\chi^2(3, 2561) = 19.77$, $p < .001$), reappraisal ($\chi^2(3, 2561) = 34.08$, $p < .001$), situation modification ($\chi^2(3, 2561) = 28.02$, $p < .001$), and suppression ($\chi^2(3, 2561) = 10.84$, $p < .001$) to regulate their child's emotion.

ER Strategy Selection by Child Age. Table 14 shows significant differences in proportion of ER and ERSB strategy use across measurement occasions by child age, using Chi-Squared estimation with pairwise mean comparison. Regarding ER strategies, caregivers of children ages 1 – 2 reported using the greatest proportion of emotion acceptance (44%) to regulate their own emotions compared to other age groups, and caregivers of children ages 5 reported using the lowest proportion of acceptance (23%) ($\chi^2(3, 2932) = 44.09$, $p < .001$). Caregivers of children ages 1 – 3 used labeling to regulate their own emotions a significantly greater proportion of measurement occasions than caregivers of children aged 5 ($\chi^2(3, 2932) = 21.50$, $p < .001$). Caregivers of children aged 3 used reappraisal to regulate their own emotions at a greater proportion of measurement occasions (13%) than caregivers of children aged 5 (7%) ($\chi^2(3, 2932) = 11.74$, $p = .008$), although this difference was not significant after correcting for multiple comparisons. Caregivers of children aged 3 also indicated "no regulation" for their own emotions at significantly fewer occasions (38%) than caregivers of children 1 – 2 (49%), 4 (50%), and 5 (55%) ($\chi^2(3, 2932) = 31.08$, $p < .001$).

Table 14.

Proportion of Measurement Occasions ER and ERSBs Used by Child Age

	ERs by Child Age				
	Age 1-2 n = 675	Age 3 n = 971	Age 4 n = 615	Age 5 n = 295	*p*-value
Acceptance	0.44^{ab}	0.38^{c}	0.31^{ad}	0.23^{bcd}	<.001
Avoid. Distract.	0.16	0.20	0.14	0.15	.01
Ignore	0.04^{a}	0.07^{ab}	0.03^{b}	0.03	.001

Table 14, continued

ERs by Child Age					
	Age 1-2 n = 675	Age 3 n = 971	Age 4 n = 615	Age 5 n = 295	*p*-value
Labeling	0.20[a]	0.20[b]	0.15	0.09[ab]	<.001
Positive Distract.	0.09	0.09	0.08	0.05	.16
Reappraisal	0.10	0.13[a]	0.09	0.07[a]	.004
Situation Mod.	0.07	0.10	0.07	0.08	.29
Social Share	0.00	0.00	0.00	0.00	---
Suppression	0.09	0.08	0.06	0.07	.26
No regulation	0.49[a]	0.38[abc]	0.50[b]	0.55[c]	<.001
Rumination	0.07	0.08	0.07	0.05	.29
ERSBs by Child Age					
	Age 1-2 n = 676	Age 3 n = 974	Age 4 n = 616	Age 5 n = 295	*p*-value
Acceptance	0.21 [ac]	0.24 [bd]	0.16 [ab]	0.12 [cd]	<.001
Avoid. Distract.	0.08[a]	0.13[abc]	0.07[b]	0.06[c]	<.001
Ignore	0.03	0.02	0.02	0.01	.38
Labeling	0.27[ac]	0.27[bd]	0.17[abe]	0.10[cde]	<.001
Positive Distract.	0.18[abc]	0.14[a]	0.10[b]	0.11[c]	<.001
Reappraisal	0.14[a]	0.20[abc]	0.12[b]	0.09[c]	<.001
Situation Mod.	0.12[ab]	0.10[cd]	0.06[ad]	0.05[bc]	<.001
Social Share	0.17[a]	0.23[ab]	0.17	0.12[b]	<.001
Suppression	0.05	0.08	0.04	0.03	.004
No regulation	0.69[a]	0.59[abc]	0.69[b]	0.73[c]	<.001
Rumination	--	--	--	--	--

Note. Significant mean differences in strategy use by child age group indicated by superscripts. After correcting for multiple comparisons, $\alpha = p < .001$.

ERSB Strategy Selection by Child Age. Regarding ERSB strategies, caregivers of children aged 3 reported using the greatest proportion of emotion acceptance (24%) to regulate their child's emotions compared to other age groups, and caregivers of children ages 5 reported using the lowest proportion of acceptance (12%) ($\chi^2(3, 2561) = 30.26$, $p < .001$). Caregivers of children aged 1 – 3 (27%) used labeling to regulate their own emotions a significantly greater proportion of measurement occasions than caregivers of children aged 4 (17%) 5 (10%) ($\chi^2(3, 2561) = 56.62$, $p < .001$). Caregivers of children aged 3 used social sharing to regulate their own emotions a significantly greater proportion of measurement occasions (23%) than caregivers of children aged 1-2 (17%), 4 (17%), 5 (12%) (χ^2(3, 2561) = 21.31, $p < .001$). Caregivers of children aged 3 used reappraisal to regulate their own emotions a significantly greater proportion of measurement occasions (20%) than caregivers of children aged 1-2 (14%), 4 (12%) 5 (9%) (χ^2(3, 2561) = 23.17, $p < .001$), and indicated "no regulation" for their child's emotions at significantly fewer occasions (59%) than caregivers of children 1 – 2 (69%), 4 (69%), and 5

(73%) (χ^2(3, 2561= 33.28, $p < .001$). There were no significant differences in regulating child emotions by age using ignoring or suppression after correcting for multiple comparisons.

ER and ERSB Strategy Selection by Child Gender. Table 15 shows significant differences in proportion of ER and ERSB strategy use across measurement occasions by child gender, using chi-squared estimation with pairwise mean comparison. There were no significant differences between caregivers of female and male-identified children in the proportion of measurement occasions each ER and ERSB strategy was used.

Table 15.

Proportion of Measurement Occasions ER and ERSBs Used by Child Gender

	ER strategies				
	Female n=1114	Male n=1114	Non-binary n=19	Decline n=35	*p*-value
Acceptance	0.35[a]	0.36[b]	0.79[ab]	0.71	<.001
Avoidant Distract	0.16[a]	0.17[b]	0.00[c]	0.43[abc]	<.001
Ignore	0.05[a]	0.04[b]	0.00	0.17[ab]	< 0.01
Labeling	0.16[a]	0.17[b]	0.74[abc]	0.31[c]	<.001
Positive Distract	0.07	0.09	0.00	0.14	.09
Reappraisal	0.11	0.11	0.11	0.11	.99
Situation Mod	0.09	0.07	0.00	0.14	.06
Social Share	0.00	0.00	0.00	0.00	---
Suppression	0.07	0.08	0.00	0.11	.39
No regulation	0.46	0.46	0.47	0.49	.98
Rumination	0.07	0.07	0.05	0.03	.77

Table 15, continued

	ERSB strategies				
	Female n=1118	Male n=1389	Non-binary n=19	Decline n=35	*p*-value
Acceptance	0.20[a]	0.18[b]	0.79[ab]	0.37	<.001
Avoidant Distract	0.08[a]	0.11	0.00	0.23[a]	<.001
Ignore	0.02	0.02	0.00	0.09	< 0.05
Labeling	0.22[a]	0.22[b]	0.63[acb]	0.23[c]	<.001
Positive Distract	0.12[a]	0.15	0.00	0.31[a]	< 0.01
Reappraisal	0.14	0.17	0.05	0.26	0.03
Situation Mod	0.08[a]	0.10[b]	0.00	0.29[ab]	<.001
Social Share	0.17[a]	0.20[b]	0.47[ab]	0.23	< 0.01
Suppression	0.05	0.06	0.00	0.00	0.09
No regulation	0.68	0.64	0.84	0.66	0.08
Rumination	---	---	---	---	---

Note. Significant mean differences in strategy use by child gender indicated by superscripts. After correcting for multiple comparisons, $\alpha = p < .001$.

The caregivers of the child identified as non-binary reported using "acceptance" to regulate their own (79%) ($\chi^2(3, 2561) = 33.51$, $p < .001$) and their child's (79%) ($\chi^2(3, 2561) = 50.51$, $p < .001$) emotions, and "labeling" to regulate their own (74%) ($\chi^2(3, 2561) = 46.40$, $p < .001$) and their child's (63%) ($\chi^2(3, 2561) = 18.17$, $p < .001$) emotions significantly more than female and male-identified children. Caregivers of children whose gender they declined to answer reported using "avoidant distraction" to regulate their own (43%) ($\chi^2(3, 2561) = 21.62$, $p < .001$) emotions, "ignoring" to regulate their own (17%) ($\chi^2(3, 2561) = 15.95$, $p = .001$) emotions, and "situation modification" to regulate their child's emotions (29%) ($\chi^2(3, 2561) = 23.32$, $p < .001$) more than caregivers of children identified as female and male.

Regulation Success Descriptives

ER and ERSB regulation success means across demographic categories and measurement occasions are presented in Table 16. Caregivers reported their perceived ER and ERSB regulation success at each EMA measurement occasion, after indicating which strategies they used (e.g., "how successful was this strategy in regulating [your or your child's] emotion," 1 = not at all successful, 6 = very successful; see Appendix A for all survey items). Overall, caregivers reported higher mean ER success of regulating their emotions at timepoints when they were not with their child (n = 377, M = 4.87) compared to timepoints when they were with their child (n = 2561 = 4.75), t(509) = 1.72, *p* = .09. Caregivers reported a mean ERSB success of 5.03 for regulating their child's emotions (n = 2561). One-way ANOVAs with Tukey mean comparisons were run between regulation success and income, time caregiver spends with child during the day, child age, child gender identity, and child lability groups. There were no significant differences in caregiver reported ER or ERSB success based on income, time spent working during the day.

Table 16.

Mean ER and ERSB Success Descriptives

	ER success					
	N / n	*M*	SD	Median	Min	Max
Caregiver with child	2561	4.75	1.37	5.00	1.00	6.00
Caregiver no child	377	4.87	1.29	5.00	1.00	6.00
Income						
$900 – 50,000	464	4.74	1.41	5.00	1.00	6.00
$50,000 – 80,000	810	4.79	1.30	5.00	1.00	6.00
$80,000 - 140,000	613	4.79	1.38	5.00	1.00	6.00
$140,000+	591	4.64	1.43	5.00	1.00	6.00
Mean Difference	$F(3, 2474) = 1.734, p = .16$					
Time working						
Home full time	1339	4.78	1.30	5.00	1.00	6.00
Work part time	466	4.64	1.50	5.00	1.00	6.00
Work full time	705	4.70	1.40	5.00	1.00	6.00
Mean Difference	$F(2, 2507) = 1.937, p = .14$					
Child Age						
1–2	671	4.83[a]	1.34	5.00	1.00	6.00
3	974	4.57[abc]	1.38	5.00	1.00	6.00
4	616	4.82[b]	1.39	5.00	1.00	6.00
5	295	5.03[c]	1.26	6.00	1.00	6.00
Mean Difference	$F(3, 2557) = 10.57, p < .001$					

Table 16, continued

	ER success					
	N / n	*M*	SD	Median	Min	Max
Child gender						
Male	1389	4.72[ac]	1.37	5.00	1.00	6.00
Female	1118	4.77[bd]	1.37	5.00	1.00	6.00
Non-binary	19	5.89[abe]	0.46	6.00	4.00	6.00
Decline	35	4.06[cde]	0.80	4.00	3.00	6.00
Mean Difference	$F(3, 2557) = 7.675, p < .001$					
Lability						
0	267	5.17[abcd]	1.24	6.00	1.00	6.00
0–1	1128	4.82[ae]	1.33	5.00	1.00	6.00
1–2	661	4.64[b]	1.36	5.00	1.00	6.00
2–3	340	4.54[ce]	1.46	5.00	1.00	6.00
3–8.06	156	4.51[d]	1.42	5.00	1.00	6.00
Mean Difference	$F(4, 2547) = 11.58, p < .001$					
	ERSB success					
	N / n	*M*	SD	Median	Min	Max
Caregiver with child	2561	5.03	1.19	5.00	1.00	6.00
Caregiver no child	---	---	---	---	---	---
Income						
$900 – 50,000	464	5.02	1.26	5.00	1.00	6.00
$50,000 – 80,000	810	5.09	1.11	5.00	1.00	6.00
$80,000 - 140,000	613	5.00	1.27	5.23	1.00	6.00
$140,000+	591	4.97	1.14	5.00	1.00	6.00
Mean Difference	$F(3, 2474) = 1.191, p = .31$					
Time working						
Home full time	1339	5.01	1.16	5.00	1.00	6.00
Work part time	466	5.00	1.32	6.00	1.00	6.00
Work full time	705	5.06	1.16	5.00	1.00	6.00
Mean Difference	$F(2, 2507) = 0.477, p = .62$					
Child Age						
1–2	671	4.83[ab]	1.00	4.00	1.00	6.00
3	974	4.93[c]	1.17	5.00	1.00	6.00
4	616	5.19[acd]	1.13	6.00	1.00	6.00
5	295	5.28[bd]	1.05	6.00	1.00	6.00
Mean Difference	$F(3, 2557) = 11.65, p < .001$					
Child gender						
Male	1389	5.00[a]	1.22	5.00	1.00	6.00
Female	1118	5.08[b]	1.16	5.00	1.00	6.00
Non-binary	19	6.00[abc]	0.00	6.00	6.00	6.00
Decline	35	4.51[c]	0.98	5.00	2.00	6.00
Mean Difference	$F(3, 2557) = 7.405, p < .001$					

Table 16, continued

	ERSB success					
	N / *n*	*M*	SD	Median	Min	Max
Lability						
0	267	5.55^{abcd}	0.91	6.00	1.00	6.00
0–1	1128	5.07^{ae}	1.15	5.00	1.00	6.00
1–2	661	4.93^{bf}	1.18	5.00	1.00	6.00
2–3	340	4.90^{c}	1.31	5.00	1.00	6.00
3–8.06	156	4.62^{def}	1.30	5.00	1.00	6.00
Mean Difference		$F(4, 2547) = 20.76, p < .001$				

Note. Significant mean differences between clusters indicated by superscripts.

ER and ERSB Mean Success by Child Age. See Table 17. ANOVAS indicated significant differences in caregiver reported ER and ERSB success by child age. Caregivers of children aged 3 reported significantly lower ER success of regulating their own emotions (n = 974, M = 4.57) compared to caregivers of each other age $F(3, 2557) = 10.57, p < .001$. Caregivers of children aged 3 also reported significantly lower ERSB success of regulating their child's emotions (n = 974, M = 4.93) compared to caregivers of children age 4 (n = 616, M = 5.19), and caregivers of children ages 1 – 2 also reported significantly lower ERSB success of regulating their child's emotions (n = 671, M = 4.83) compared to caregivers of children age 4 (n = 616, M = 5.19) and age 5 (n = 295, M = 5.28).

ER and ERSB Success Frequency by Child Age. Table 17 shows differences in the proportion of measurement occasions in which caregivers reported low, medium, or high ER and ERSB success by child age. There were no significant differences in the proportion of low ER and ERSB success measurement occasions based on child age. Caregivers of children ages 1 – 3 years reported significantly greater proportion of medium success ER (1 – 2 years = 26%; 3 years = 24%) ($\chi^2(3, 2938) = 14.41, p = .002$) and ERSB (1 – 2 = 25%; 3 years = 25%) ($\chi^2(3, 2938) = 15.40, p = .002$) measurement occasions than caregivers of children ages 4 (ER = 19%; ERSB = 20%) and 5 (ER = 15%; ERSB = 14%). Caregivers of children age 3 reported significantly lower proportion of high ER success (58%) measurement occasions than children of all other ages ($\chi^2(3, 2938) = 24.43$, $p < .001$), and lower proportion of high ERSB success (71%) than children ages 4 (77%) and 5 (82%). Caregivers of children ages 1 – 2 years reported the lowest proportion of high ERSB success timepoints (69%), which was significantly less than ages 4 and 5 ($\chi^2(3, 2938) = 20.36$, $p < .001$).

Table 17.

Proportion of Occasions with Low, Medium, and High ER and ERSB success by Age

	ER success				
	Age 1-2 n = 676	Age 3 n = 974	Age 4 n = 616	Age 5 n = 295	*p*-value
Low success	0.07	0.09	0.08	0.05	.09
Med Success	0.26[a]	0.24[c]	0.19[ab]	0.15[bc]	<.001
High Success	0.66[a]	0.58[abc]	0.65[b]	0.73[c]	<.001
	ERSB success				
	Age 1-2 n = 676	Age 3 n = 974	Age 4 n = 616	Age 5 n = 295	*p*- value
Low success	0.06	0.05	0.03	0.03	.16
Med Success	0.25[a]	0.25[b]	0.20	0.14[ab]	< .001
High Success	0.69[ac]	0.71[bd]	0.77[ab]	0.82[cd]	< .001

Note. After correcting for multiple comparisons, $\alpha = p < .004$

ER and ERSB Mean Success by Child Gender. See Table 16. ANOVAS indicated significant differences in caregiver reported ER and ERSB success by caregiver-reported child gender. There were no significant differences in caregiver-reported ER or ERSB success between children identified as male and female. The caregiver of the child identified as non-binary reported significantly higher ER (n = 19, M = 5.89) ($F(3, 2557) = 7.675$, $p < .001$) and ERSB (n = 19, M = 6.00) ($F(3, 2557) = 7.405$, $p < .001$) success than male, female, and children whose caregivers declined to report gender.

ER and ERSB Success Frequency by Child Gender. Table 18 shows differences in the proportion of measurement occasions rated by caregivers as having low, medium, or high ER and ERSB success by child gender. There were no significant differences in the proportion of low ER and ERSB success measurement occasions between male and female-identified children.

Table 18.

Proportion of Occasions with Low, Medium, and High ER and ERSB success by Child Gender

	ER success				
	Female n=1118	Male n=1389	Non-binary n=19	Decline n=35	*p*-values
Low success	0.07	0.09	0.00	0.00	.12
Medium success	0.21[ab]	0.23[c]	0.00[a]	0.37[bc]	.01
High success	0.64[a]	0.63[b]	0.95[ab]	0.34[b]	< .001
	ERSB success				
	Female n=1118	Male n=1389	Non-binary n=19	Decline n=35	*p*-value
Low success	0.04	0.05	0.00	0.06	.78
Medium success	0.21[a]	0.24[b]	0.00	0.31[ab]	.02
High success	0.75[ac]	0.72[bd]	1.00[ab]	0.63[cd]	.01

Note. After correcting for multiple comparisons, $\alpha = p < .004$.

ER and ERSB Mean Success by Child Lability. See Table 16. ANOVAS also indicated significant differences in caregiver reported ER and ERSB success by child emotional lability. There were significant differences in caregiver-reported ER success by child lability group, $F(4, 2547) = 11.58$, $p < .001$. Specifically, caregivers of children in the no lability group indicated significantly higher mean success of regulating their own emotions (n = 267, M = 5.17) compared to caregivers of children in all other lability groups. There were also significant differences in caregiver reported ERSB success by child lability group, $F(4, 2547) = 20.76$, $p < .001$. Caregivers of children in the no lability group indicated significantly higher mean ERSB success of regulating their child's emotions (n = 267, M = 5.55) compared to caregivers in all other lability groups. Caregivers of children in the highest lability group (3 – 8.06) also reported significantly lower mean ERSB success (n = 156, M = 4.62) than caregivers of children in the lowest three lability groups.

ER Success Frequency by Caregiver Valence. Table 19 shows differences in the proportion of measurement occasions rated by caregivers as having low, medium, or high ER and ERSB success by caregiver and child emotion valence. There were significant differences for ER and ERSB success by valence at each level of success (Likert 1–6; 1–2 = low success, 3–4 = medium success, 5–6 = high success).

Table 19.

Proportion of Occasions with Low, Medium, and High ER and ERSB Success by Valence

	Caregiver emotion valence		
	Positive n=1857	Negative n=704	*p*-value
ER success			
Low success	0.02	0.23	< .001
Medium success	0.18	0.33	< .001
High success	0.78	0.26	< .001
ERSB success			
Low success	0.02	0.10	< .001
Moderate success	0.17	0.37	.07
High success	0.81	0.53	.83
	Child emotion valence		
	Positive n=2374	Negative n=187	*p*-value
ER success	0.07	0.13	.01
Low success	0.20	0.47	< .001
Medium success	0.65	0.48	< .001
High success			
ERSB success	0.04	0.16	< .001
Low success	0.21	0.42	< .001
Moderate success	0.76	0.42	< .001
High success			

Note. After correcting for multiple comparisons, $\alpha = p < .002$.

At measurement occasions when a negative caregiver emotion was reported, caregivers were: more likely to report low ER success (23% compared to 2% for positive emotions; χ^2(3,

2938) = 92.27, $p < .001$), more likely to report medium ER success (33% compared to 18% for positive emotions; $\chi^2(3, 2938) = 13.03$, $p < .001$), and less likely) to report high ER success (26% compared to 78% for positive emotions; $\chi^2(3, 2938) = 280.05$, $p < .001$).

ER Success Frequency by Child Valence. At measurement occasions when a negative child emotion was reported, caregivers were: more likely to report low ER success (13% compared to 7% for positive emotions; $\chi^2(3, 2938) = 45.49$, $p < .001$), more likely to report medium ER success (47% compared to 20% for positive emotions; $\chi^2(3, 2938) = 200.41$, $p < .001$), and less likely to report high ER success (48% compared to 65% for positive emotions; $\chi^2(3, 2938) = 280.05$, $p < .001$).

ERSB Success Frequency by Caregiver Valence. At measurement occasions when a negative caregiver emotion was reported, caregivers were more likely to report low ERSB success (10% compared to 2% for positive emotions; $\chi^2(3, 2938) = 10.39$, $p < .001$). There were not significant differences in the likelihood of reporting medium or high ERSB success by caregiver emotion valence.

ERSB Success Frequency by Child Valence. At measurement occasions when a negative child emotion was reported, caregivers were: more likely to report low ERSB success (16% compared to 4% for positive emotions; $\chi^2(3, 2938) = 11.54$, $p < .001$), more likely to report medium ERSB success (42% compared to 21% for positive emotions; $\chi^2(3, 2938) = 227.67$, $p < .001$), and less likely to report high ERSB success (42% compared to 76% for positive emotions; $\chi^2(3, 2938) = 241.7$, $p < .001$).

Child Emotional Lability Descriptives.

Child emotional lability means across demographic categories are presented in Table 20. Of the full of sample 197, 185 children had enough EMA data points for a lability score to be calculated using mean successive square difference (MSSD). Overall, the mean lability score of the sample was 1.16 (median = 0.77, SD = 1.30, range = 0 – 8.06). One-way ANOVAs with Tukey mean comparisons were run between child lability and income, time caregiver spends with child during the day, child age, child gender, and ER and ERSB success. There were no significant differences in child lability based on income, caregiver time spent working during the day, child age, or child gender.

Table 20

Mean Child Lability Descriptives

	N	Mean	Median	SD	Min	Max
Child lability	185	1.16	0.77	1.30	0.00	8.06
Income						
$900 – 50,000	33	1.42	0.83	1.66	0.00	8.00
$50,000 – 80,000	54	1.32	1.54	1.54	0.00	8.06
$80,000 - 140,000	48	0.98	0.98	0.97	0.00	3.71
$140,000+	46	1.00	0.80	0.96	0.00	4.33
Mean difference	$F(1, 179) = 2.848, p = .09$					
Time working						
Home full time	85	1.19	0.90	1.24	0.00	8.06
Work part time	35	1.30	1.00	1.14	0.00	4.00
Work full time	62	1.08	0.57	1.47	0.00	8.00
Mean difference	$F(1, 180) = 0.201, p = .66$					
Child Age						
1-2	51	1.32	1.00	1.43	0.00	8.00
3	70	1.06	0.68	1.26	0.00	8.06
4	44	1.19	0.92	1.32	0.00	5.86
5	20	1.05	0.54	1.05	0.00	3.47
Mean difference	$F(1, 183) = 0.273, p = .60$					
Child gender						
Male	101	1.24	0.86	1.36	0.00	8.00
Female	81	1.06	0.67	1.22	0.00	8.06
Non-binary	1	0.22	0.22	--	0.22	0.22
Mean difference	$F(1, 180) = 0.822, p = .37$					
ER Success						
Low success	202	1.45[a]	1.03	1.29	0.00	8.06
Medium success	570	1.28[b]	1.00	1.24	0.00	8.06
High success	1624	1.08[ab]	0.75	1.18	0.00	8.06
Mean difference	$F(2, 2157) = 13.59, p < .001$					

Table 20, continued

	N	Mean	Median	SD	Min	Max
ERSB Success						
Low success	113	1.46^{a}	1.17	1.21	0.00	8.00
Medium success	573	1.28^{b}	1.00	1.28	0.00	8.06
High success	1866	1.10^{ab}	1.00	1.19	0.00	8.06
Mean difference	$F(2, 2549) = 8.756, p < .001$					

Mean Lability by ER and ERSB Success. ANOVAS indicated significant differences in mean lability of children represented at measurement occasions with low, medium, and high caregiver-reported ER and ERSB success. Child lability mean was significantly lower at high success ER measurement occasions (n = 1624, M = 1.08) compared to medium (n = 570, M = 1.28) and low (n = 202, M = 1.45) ER success measurement occasions, $F(2, 2157) = 13.59$, $p < .001$. Similarly, child lability mean was significantly lower at high success ERSB measurement occasions (n = 1866, M = 1.10) compared to medium (n = 573, M = 1.28) and low (n = 113, M = 1.46) ERSB success measurement occasions, $F(2, 2549) = 8.756$, $p < .001$.

Research Question 1

Caregiver ER Latent Class Models.

Level 1 (Occasion Level) ER Classes. Latent class analyses were run with all measurement occasions completed at times when caregivers reported having been with their child since the previous EMA survey (n = 2561). These included measurement occasions in which the caregiver reported both positively and negatively-valanced emotions.

To identify the ML-LCA model with optimal number of latent classes and clusters at each level, I first fit a model to determine the number of caregiver ER classes at Level 1 (the measurement occasion level). Table 21 shows the fit statistics for level 1 (occasion level) LCA models which ignore the multilevel structure of the data. Although the AIC continues to decrease as number of classes increases, the BIC increases with increasing model complexity. Class separation was acceptable for all models (e.g., entropy was above 0.89, while above 0.80 considered acceptable; Weller et al., 2020). The most suitable model was thus determined to be the three-class model, which optimized balance between decreasing AIC values, increasing BIC values, and degrees of freedom, which also decreased substantially with increasing model complexity.

Table 21.

Level 1 and 2 ER Latent Class Analysis Fit Statistics

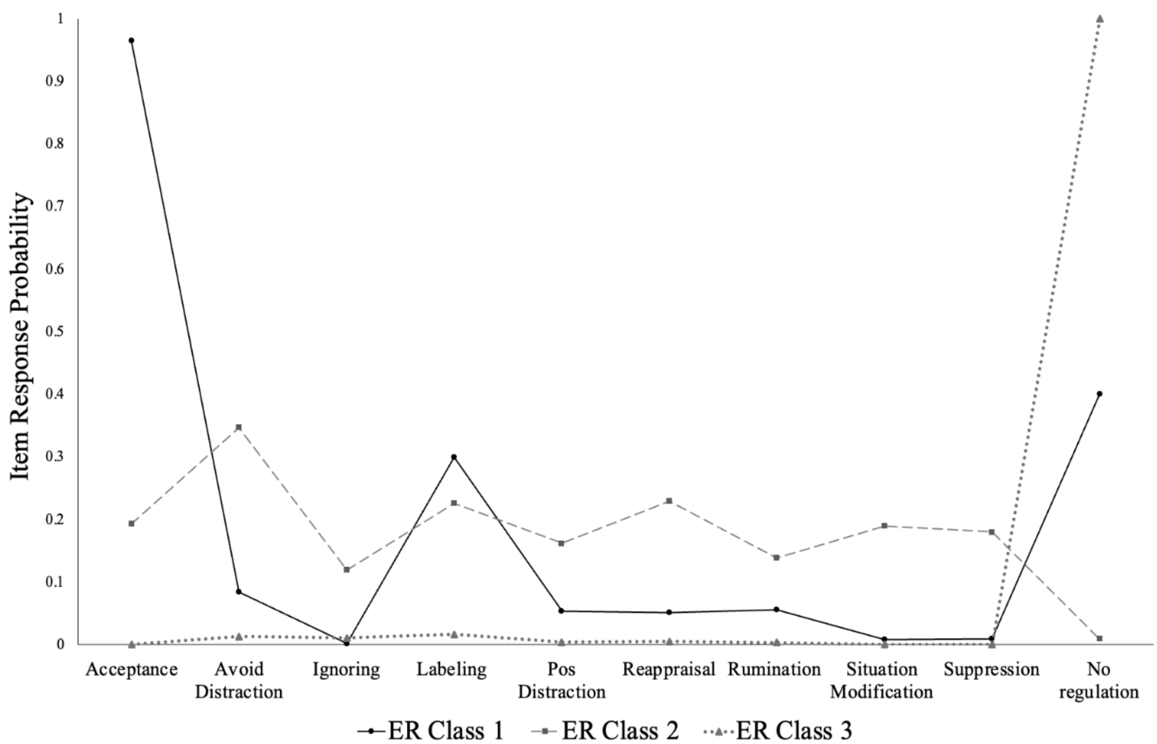
Number of classes	AIC	BIC	df	Entropy
Level 1: Measurement Occasion Classes				
Two	18266.19	19724.44	2342	0.89
Three	**17532.78**	**19966.80**	**2139**	**0.90**
Four	17428.71	21047.51	1936	0.91
Five	17356.15	22983.73	1733	0.94
Level 2: Caregiver Clusters				
Two	17688.26	17892.87	2520	0.85
Three	**17610.47**	**17832.63**	**2517**	**0.87**
Four	17598.22	17878.91	2514	0.87
Five	17586.79	17844.02	2511	0.87

Note. The best-fitting solution is highlighted in bold

Figure 1 displays item response probabilities for each ER strategy across measurement occasion given class. **ER class 1** is characterized by occasions in which caregivers indicated use of primarily acceptance (proportion of class 1 measurement occasions in which strategy use occurred = 0.98), labeling (0.28), and no regulation (0.48) to regulate their own emotions. **ER class 2** is characterized by occasions in which caregiver reported using a mix of several regulation strategies but always reported doing something to regulate their emotions (no regulation = 0.01). Class 2 ER strategies including avoidant distraction (0.34), labeling (0.23), reappraisal (0.23), acceptance (0.20), situation modification (0.19), suppression (0.18), positive distraction (0.17), and rumination (0.13). **ER class 3** is characterized by occasions in which caregivers primarily indicated that no regulation strategy was used (1.00).

Figure 1.

Item Response Probabilities for Level 1 (Measurement Occasion) ER Classes

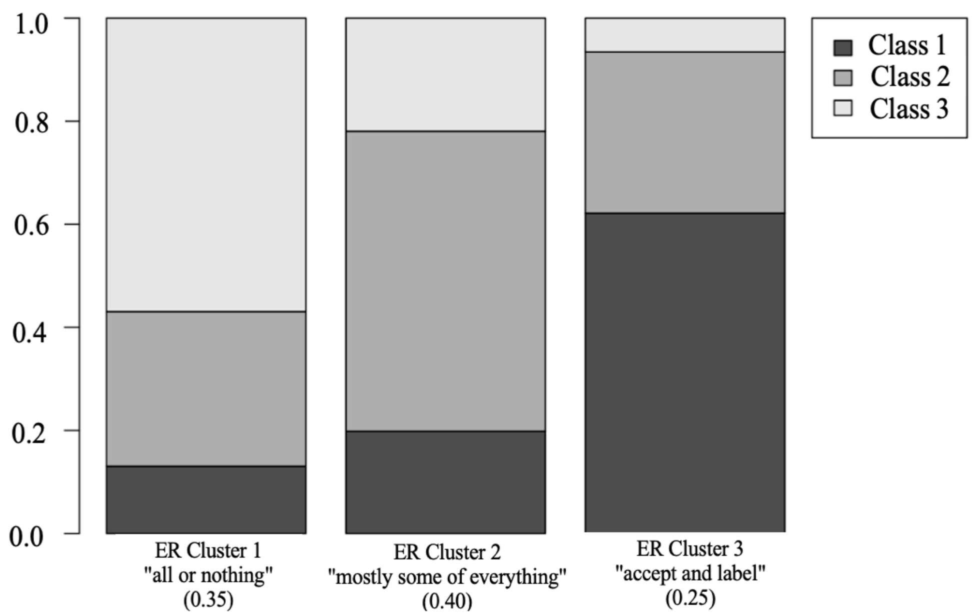


Level 2 (Caregiver Level) ER Clusters. At Level 2, I then determined the optimal number of Level 2 clusters. Clusters reflect groups individuals who show similar patterns of occasion-level regulation class usage over time. Table 21 shows the fit statistics for a series of ML-LCA models with three Level 1 classes and two to five Level 2 clusters. While again the AIC decreases as number of classes increases, the BIC decreases from two to three clusters, then begins increasing from three to four and four to five clusters. (e.g., entropy above 0.85, while above 0.80 considered acceptable, Weller et al.; 2020). The most suitable model was thus determined to be the three class and three cluster model for caregiver ER.

Figure 2 displays Level 1 ER class prevalences by Level 2 caregiver ER clusters. **ER cluster 1** comprised 35% of caregivers in the sample. The ER use of caregivers in cluster 1 is characterized by use of primarily class 3 (0.57) and class 2 (0.30). In other words, these caregivers typically did not regulate at all or regulated with many strategies. I accordingly labeled ER cluster 1 the *"all or nothing"* cluster. **ER cluster 2** comprised 40% of caregivers in the sample. The ER use of caregivers in cluster 2 is characterized by primarily use of class 2 (0.58), with some of class 1 (0.19) and class 3 (0.21). I labeled ER cluster 2 the *"mostly some of everything"* cluster, given their reliance on the class with use of many strategies. **ER cluster 3** comprised 25% of caregivers in the sample. The ER use of caregivers in cluster 3 is characterized by primarily use of class 1 (0.62), with some of class 2 (0.31). I labeled this ER cluster the *"accept and label"* cluster given their tendency to rely on class 1 strategies. See Appendix B for a table with ER and ERSB clusters and their labels.

Figure 2.

Level 1 (Measurement Occasion) ER Class Prevalences by Level 2 (Caregiver) ER Cluster



ER Cluster Covariates. Cluster covariates are displayed in Table 22. Logistic regressions violated the assumption of heterogeneity, so statistics were computed using bootstraps with 1000 iterations (Astivia and Zumbo, 2019). Confidence intervals interpreted to determine significance at the $p < .05$, .01, and .001 levels, based on two-tailed significance values. Based on the bootstrapped logistic regression analysis, child age was found to be a significant predictor of Cluster 1 (“all or nothing”), with each one-unit increase in child age increasing the odds of belonging to the “all or nothing” cluster by 6.80% (OR = 1.068, 95% CI[1.050, 1.086], $p < .001$). Child age was also found to be a significant predictor of Cluster 3 (“accept and label”) (OR = 1.004, 95% CI[0.955, 0.979], $p < .001$), with each one-unit increase in child age decreasing the odds of caregivers belonging to the “accept and label” cluster by 0.4%.

Table 22.

ER Cluster Membership by Covariates: Bootstrapped Logistic Regression Outcomes

	Bootstrap			
	Beta coefficient	SD	Odds Ratios (95% CIs)	*p*-value
ER cluster 1: *“all or nothing”*				
Child age	0.07	0.01	1.07 (1.05 – 1.09)	.001
Child male	-0.03	0.02	0.97 (0.94 – 1.01)	.05
Income	0.00	0.00	1.00 (0.99 – 1.00)	.05
EMA compliance	0.00	0.00	1.00 (1.00 – 1.00)	.001
ER cluster 2: *“mostly some everything”*				
Child age	-0.01	0.01	0.99 (0.98 – 1.01)	.05
Child male	0.07	0.02	1.07 (1.03 – 1.11)	.001
Income	-0.00	0.00	0.99 (0.99 – 0.99)	.05
EMA compliance	0.01	0.00	1.00 (1.00 – 1.00)	.001
ER cluster 3: *“accept and label”*				
Child age	-0.03	0.006	1.00 (0.96 – 0.98)	.001
Child male	0.01	0.013	0.99 (0.97 – 1.02)	>.05
Income	-0.00	0.000	1.00 (0.99 – 1.00)	>.05
EMA compliance	-0.00	0.000	1.00 (0.99 – 1.00)	.001

Child gender was a significant predictor of membership in ER cluster 2 (“mostly some of everything”), with caregivers of male-identified children being more likely to be in the “mostly some of everything" cluster compared to caregivers of female-identified children (OR = 1.074, 95% CI[1.034, 1.114], $p < .001$).

EMA compliance was a significant predictor of membership in all three ER clusters. For ER Cluster 1 ("all or nothing"), each percent increase in survey compliance was associated with a 0.4% increase in the odds of caregivers belonging to "all or nothing" (OR = 1.004, 95% CI[1.003, 1.004], $p < .001$). For ER Cluster 2 ("mostly some of everything"), each percent increase in survey compliance was associated with a 0.2% increase in the odds of belonging to "mostly some of everything" (OR = 1.002, 95% CI[1.001, 1.002], $p < .001$). For ER Cluster 3 ("accept and label"), each percent increase in survey compliance was associated with a 0.2% increase in the odds of belonging to "accept and label" (OR = 1.002, 95% CI[1.001, 1.002], $p < .001$).

Caregiver ERSB Latent Class Models.

Level 1 (Occasion Level) ERSB Classes. Table 23 shows the fit statistics level 1 (occasion level) LCA models which ignore the multilevel structure of the data. Although the AIC continues to decrease as number of classes increases, the BIC is increases with increasing model complexity, and steadily loses degrees of freedom. There was no clear "best" model fit based on fit indices. Class separation was acceptable for all models (e.g., entropy above 0.86, while above 0.80 considered acceptable; Weller et al., 2020). I chose to move forward with the three-class model, which optimized balance between decreasing AIC values, increasing BIC values, and degrees of freedom.

Table 23.

Level 1 and 2 ERSB Latent Class Analysis Fit Statistics

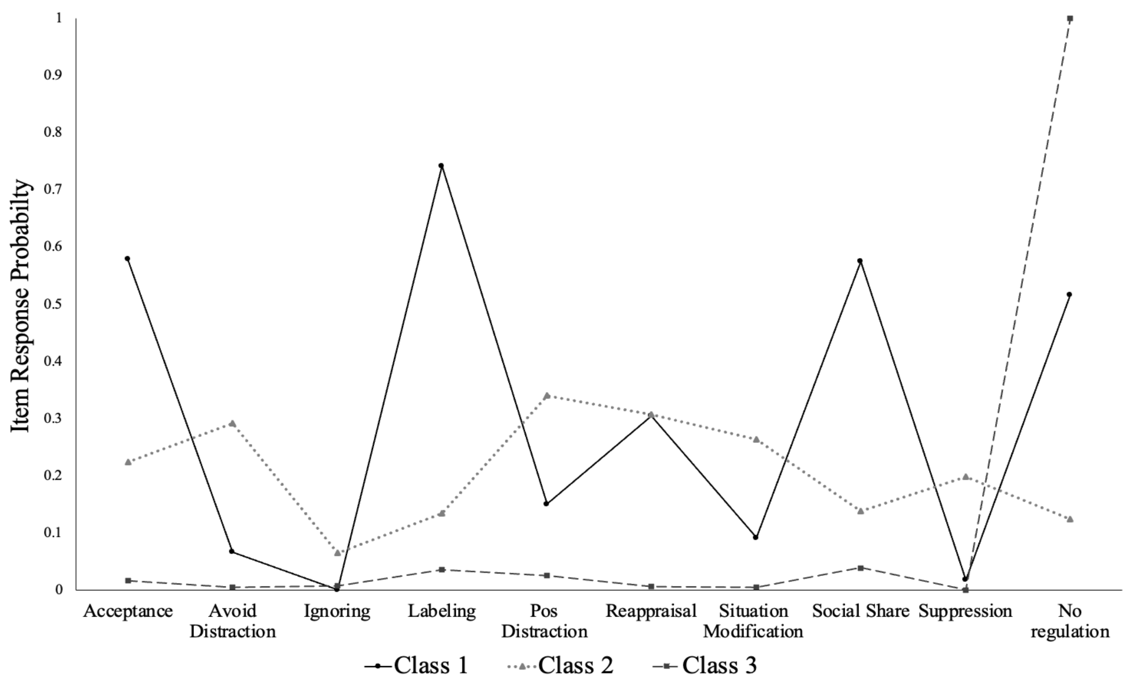
Number of classes	AIC	BIC	df	Entropy
Level 1: Measurement Occasion Classes				
Two	17572.1	18817.76	2347	0.86
Three	**16822.55**	**19255.38**	**2144**	**0.87**
Four	16672.74	21292.74	1941	0.88
Five	16728.85	21536.03	1738	0.89
Level 2: Caregiver Clusters				
Two	17083.69	17288.38	2525	0.84
Three	16941.50	17163.73	2653	0.83
Four	16904.24	17144.02	2519	0.83
Five	**16854.15**	**17111.47**	**2516**	**0.84**
Six	16842.65	17117.52	2513	0.84

Note. The best-fitting solution is highlighted in bold

Figure 3 displays item response probabilities for each ER strategy across measurement occasion given class. **ERSB class 1** is characterized by occasions in which caregivers reported using a mix of all available strategies (“everything” class). Class 1 ERSB strategies included positive distraction (0.34), appraisal (0.30), avoidant distraction (0.29), situation modification (0.26), acceptance (0.21), suppression (0.19), social sharing (14), no regulation (0.14), labeling (0.12), and ignoring (0.06). **ERSB class 2** is characterized by occasions in which caregivers primarily indicated no regulation strategy was used to regulate their child’s emotions (1.00; “no regulation” class). **ERSB class 3** is characterized by occasions in which caregivers indicated use of primarily acceptance (0.58), labeling (0.77), social sharing (0.58), no regulation (0.49), and reappraisal (0.32) to regulate their child’s emotions (“engagement-focused strategy class”).

Figure 3.

Item Response Probabilities for Level 1 (Measurement Occasion) ERSB Classes



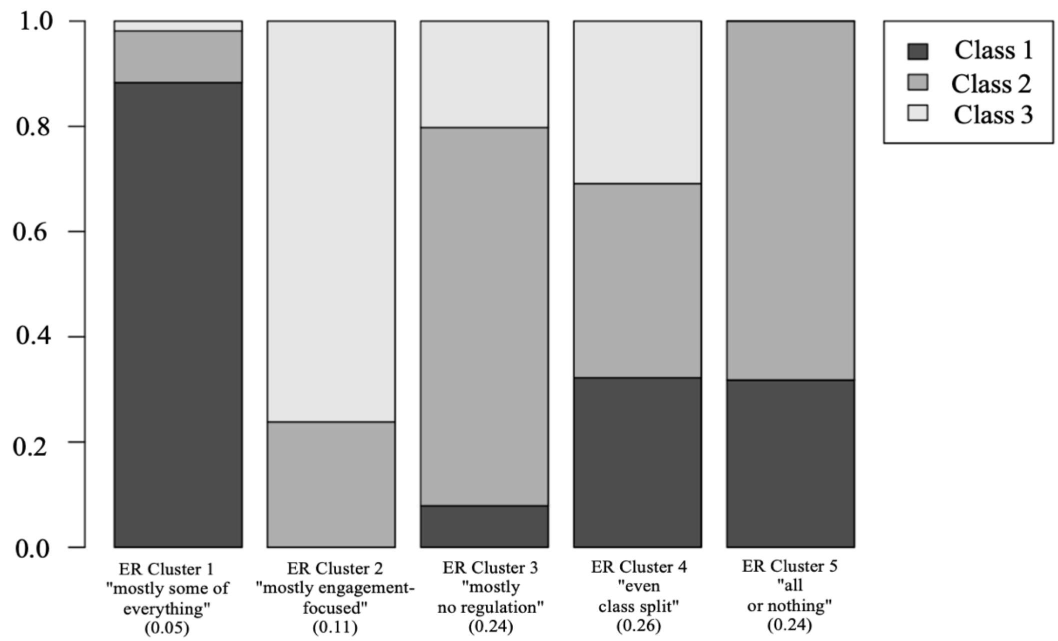
Engagement-focused regulation strategies involve interacting with and processing emotional stimuli, while disengagement-focused regulation strategies involve redirecting attention away from emotion-inducing stimuli (Sheppes et al., 2014). Reappraisal and affect labeling are commonly-documented engagement-focused regulation strategies (Sheppes et al., 2011; Levy-Gigi & Shamay-Tsoory, 2022). Empirical arguments have been made for acceptance to be categorized as both an engagement (Webb et al., 2012) and disengagement-focused (Slutsky et al., 2017) strategy. Given that the definition of acceptance is to not make conscious efforts to change the experienced emotion, but rather to receive the emotion without attempts to control them (Hayes, 2004), and that our survey item for caregiver acceptance of child emotion suggests verbal or physical interaction with child emotion (i.e., “I expressed that it was OK to feel their emotion”), characterization of this cluster’s frequent use of acceptance as part of the use of “engagement-focused” socialization behaviors was deemed appropriate. Social sharing was also determined to meet criteria based on the definition of acceptance (Zaki & Williams, 2013).

Level 2 (Caregiver Level) ERSB Clusters. Table 23 shows the fit statistics for a series of ML-LCA models with three Level 1 classes, and two, three, four, and five Level 2 clusters. Clusters reflect groups of individuals who differ together in their use of occasion-level regulation classes over time. While, again, the AIC decreased as the number of classes increased, the BIC decreased with each additional cluster until five clusters, then began increasing from five to six clusters (e.g., entropy above 0.83, while above 0.80 considered acceptable; Weller et al., 2020). The most suitable model was thus determined to be the three-class (occasion level profiles) and five-cluster (caregiver level profiles) model for caregiver ERSB strategies.

Figure 4 displays Level 1 ERSB class prevalences by Level 2 caregiver ERSB clusters. **ERSB cluster 1** comprised 5% of caregivers in the sample. The ERSB use of caregivers in cluster 1 is characterized by use of primarily class 1 (everything class; 0.88). I accordingly labeled ERSB cluster 1 the *“mostly some of everything”* cluster. **ERSB cluster 2** comprised 11% of caregivers in the sample. The ERSB use of caregivers in cluster 2 is characterized by primarily use of class 3 (engagement-focused strategy class; 0.76), with some of class 2 (no regulation class; 0.24). I labeled ERSB cluster 2 the *“mostly engagement-focused”* cluster, given their reliance on the class with acceptance, labeling, reappraisal, and social sharing (e.g., class 3). **ERSB cluster 3** comprised 24% of caregivers in the sample. The ERSB use of caregivers in cluster 3 was characterized by primarily use of class 2 (no regulation class; 0.72), with some of class 3 (engagement-focused strategy class; 0.21). I labeled this ERSB cluster the *“mostly no regulation”* cluster given their reliance on class 2, indicating “no regulation” of their child’s emotions. **ERSB cluster 4** comprised 26% of caregivers in the sample. The ERSB use of caregivers in this sample was characterized by nearly equal use of each class (Class 1: 0.32; Class 2: 0.37; Class 3: 0.31). I labeled this ERSB cluster the *"even class split"* cluster given their equal use of each occasion-level regulation class to regulate their child's emotions. **ERSB cluster 5** comprised 34% of caregiver in the sample. The ERSB use of caregivers in this sample was characterized by primarily use of class 2 (no regulation class; 0.68) and some use of class 1 (everything class; 0.32). I labeled this ERSB cluster the "*all or nothing*" cluster. See Appendix B for a table with ER and ERSB clusters and their labels.

Figure 4.

Level 1 (Measurement Occasion) ERSB Class Prevalences by Level 2 (Caregiver) ERSB Clusters



ERSB Cluster Covariates. Results from covariate analyses are displayed in Table 24. Logistic regressions violated the assumption of heterogeneity, so statistics were computed using bootstraps with 1000 iterations. Confidence intervals interpreted to determine significance at the $p < .05$, .01, and .001 levels, based on two-tailed significance values.

Table 24.

ERSB Cluster Membership by Covariates: Bootstrapped Logistic Regression Outcomes

	Bootstrap			
	Beta coefficient	SD	Odds Ratios (95% CIs)	*p*-value
ERSB cluster 1:*“mostly some of everything”*				
Child age	-0.02	0.00	0.98 (0.97 – 0.98)	.001
Child male	0.07	0.01	1.01 (1.00 – 1.03)	.05
Income	-0.00	0.00	0.99 (0.99 – 01.00)	.001
EMA compliance	0.00	0.00	1.00 (1.00 – 1.00)	.001
ERSB cluster 2:*“mostly engagement-focused”*				
Child age	-0.04	0.01	0.96 (0.95 – 0.97)	.001
Child male	-0.06	0.01	0.95 (0.92 – 0.97)	.001
Income	-0.00	0.00	1.00 (0.99 – 1.00)	>.05
EMA compliance	0.00	0.00	1.00 (1.000 -1.00)	.001
ERSB cluster 3:*“mostly No Regulation”*				
Child age	0.00	0.01	1.00 (0.99 – 1.02)	>.05
Child male	-0.01	0.01	0.99 (0.96 – 1.01)	>.05
Income	0.00	0.00	1.00 (0.99 – 1.00)	>.05
EMA compliance	0.02	0.00	1.00 (1.00 – 1.00)	.001
ERSB cluster 4: *“even class split”*				
Child age	-0.02	0.01	0.98 (0.97 – 0.99)	.01
Child male	0.13	0.02	1.13 (1.102 – 1.69)	.001
Income	0.00	0.00	1.00 (1.00 – 1.00)	>.05
EMA compliance	0.00	0.00	1.01 (1.00 – 1.002)	.001
ERSB cluster 5:*“all or nothing”*				
Child age	0.08	0.01	1.08 (1.06 – 1.10)	.001
Child male	-0.37	0.08	0.87 (0.85 – 0.91)	.001
Income	0.00	0.00	0.99 (0.99 – 0.99)	>.05
EMA compliance	0.00	0.00	1.00 (1.00 – 1.00)	.001

Based on the bootstrapped logistic regression analysis, child age was found to be a significant predictor of Cluster 1 (“mostly some of everything”), with each one-year increase in child age decreasing the odds of belonging to the “all or nothing” cluster by 3% (OR = 0.98, 95% CI[0.97, 0.98], $p < .001$). Child age was also found to be a significant predictor of Cluster 2 (“mostly engagement-focused”; OR = 0.96, 95% CI[0.95, 0.97], $p < .001$), with each one-year increase in child age decreasing the odds of belonging to the “mostly engagement-focused” cluster by 4%. Child age was also found to be a significant predictor of Cluster 4 (“even class split”; OR= 0.98 95% CI[0.97, 0.99], $p < .01$), with each one-year increase in child age decreasing the odds of belonging to the "mostly engagement-focused" cluster by 2%. Lastly, child age was also found to be a significant predictor of Cluster 5 ("all or nothing"; OR = 1.078 95% CI[1.06, 1.10], $p < .001$), with each one-year increase in child age increasing the odds of belonging to the "all or nothing" cluster by 7.8%.

Child gender was also significant predictor of ERSB cluster membership in clusters 1, 2, 4, and 5. Regarding Cluster 1 ("mostly some of everything"), caregivers of male-identified children had 1.7% increased odds of belonging to the "mostly some of everything" cluster compared to female children (OR = 1.017, 95% CI[1.001, 1.033], $p < .05$). Caregivers of male-identified children were 5% less likely to be in Cluster 2 ("mostly engagement-focused"; OR = 0.95, 95% CI [0.92, 0.97], $p < .001$) compared to female-identified children. Caregivers of male-identified children had 12.6% increased odds of belonging to Cluster 4 ("even class split"; OR = 1.13, 95% CI[1.10, 1.69], $p < .001$) compared to female-identified children. Lastly, caregivers of male-identified children were 14% less likely to belong to Cluster 5 ("all or nothing"; OR = 0.87, 95% CI[0.85, 0.91], $p < .001$) compared to female-identified children.

Caregiver income was a significant predictor of ERSB cluster membership in clusters 1 and 5. Regarding Cluster 1 ("mostly some of everything"), for each $1 increase in income, odds of belonging to the "mostly some of everything" cluster decreased by 0.3% (OR = 0.997, 95% CI[0.997, 0.998], $p < .001$). For Cluster 5 ("all or nothing") for each $1 increase in income, odds of belonging to the "mostly some of everything" cluster decreased by 0.1% (OR = 0.99, 95% CI[0.99, 0.99], $p < .05$).

EMA compliance was a significant predictor of membership in all five ERSB clusters. Consistent with associations between compliance and ER clusters, each percent increase in survey compliance was associated with increases in likelihood (ranging from 0.1 – 0.2%) of membership in all 5 ERSB clusters.

ER Cluster Membership Predicting ERSB Cluster Membership

To assess the relationship between caregiver ER cluster membership and ERSB cluster membership, I ran a series of logistic regressions, with a categorical caregiver ER cluster predicting each ERSB clusters (1 – 5) in separate models. ER cluster 3 ("accept and label") was used as the reference cluster. All models controlled for child age, caregiver-identified child gender, income, and EMA compliance. Logistic regression models violated the assumption of normality, so logistic regression models were bootstrapped with 1000 re-sampling iterations. Bootstrapped model confidence intervals were interpreted at the .05, .01, .001 levels of significance. Results from these bootstrapped analyses are reported below for each ERSB cluster and can be found in Table 25.

Table 25.

Bootstrapped Logistic Regression: ER Cluster Predicting ERSB Cluster

	ERSB cluster 1 *"mostly some of everything"*	ERSB cluster 2 *"engagement-focused"*	ERSB cluster 3 *"mostly no reg"*	ERSB cluster 4 "even class split"	ERSB cluster 5 "all or nothing"
	Bootstrap Results: Odds Ratio [95% CI]				
ER cluster 1: *"all or nothing"*	1.01 [1.00 – 1.01]**	0.79 [0.75 – 0.83]***	1.25 [1.20 – 1.30]***	0.92 (0.88 – 0.96)***	1.11 [1.05 – 1.17]***
ER cluster 2: *"mostly everything"*	1.10 [1.08 – 1.12]***	0.80 [0.77 – 0 84]***	0.97 [0.94 – 0.99]*	1.18 [1.12 – 1.24]***	0.99 [0.94 – 1.05]
ER cluster 3: Reference *"accept and label"*	–	–	–	–	–
No cluster: *Posterior probability < 0.80*	1.05 [1.03 – 1.06]***	0.89 [0.84 – 0.93]***	1.05 [1.00 – 1.08]*	1.05 [0.99 – 1.11]	0.92 [0.87 – 0.96]***

Table 25, continued

	ERSB cluster 1 *"mostly some of everything"*	ERSB cluster 2 *"engagement -focused"*	ERSB cluster 3 *"mostly no regulation"*	ERSB cluster 4 "even class split"	ERSB cluster 5 "all or nothing"
			Bootstrap Results: Odds Ratio [95% CI]		
Covariates					
Child age	0.98 [0.97 – 0.98]***	0.97 [0.96 – 0.98]***	0.99 [0.98 – 1.00]	0.99 [0.98 – 1.00]	1.07 [1.05 – 1.09]***
Child male	1.01 [0.99 – 1.03]	0.95 [0.93 – 0.97]***	0.99 [0.97 – 1.02]	1.12 [1.09 – 1.15]***	0.87 [0.84 – 0.90]***
Income	0.99 [0.99 – 0.99]***	1.00 [0.99 – 1.00]	1.00 [0.99 – 1.00]	1.00 [1.00 – 1.00]***	0.99 [0.99 – 0.99]***
EMA compliance	1.00 [1.00 – 1.00]***	1.00 [1.00 – 1.00]***	1.00 [1.00 – 1.00]***	1.00 [1.00 – 1.00]***	1.00 [1.00 – 1.00]***

Note. ***$p < .001$, **$p < .01$, *$p < .05$

ERSB Cluster 1: "*mostly some of everything*". Caregivers in ER cluster 1 ("all or nothing"), ER cluster 2 ("mostly some of everything"), and "no ER cluster" (posterior probability > 0.80) were all significantly more likely than caregivers in ER cluster 3 ("accept and label") to be in the "mostly some of everything" ERSB cluster. Compared to ER cluster 2 ("accept and label"), ER cluster 1 ("all or nothing"), was 1% more likely to be in the "mostly some of everything" ERSB cluster (OR = 1.01, 95% CI[1.00 – 1.01], $p < .01$), ER cluster 2 ("mostly some of everything") was 10% more likely to be in the "mostly some of everything" ERSB cluster (OR = 1.10, 95% CI[1.08 – 1.12], $p < .001$), and caregivers in no ER cluster (posterior probability > 0.80) was 5% more likely to be in the "mostly some of everything" ERSB cluster (OR = 1.05, 95% CI[1.00 – 1.10], $p < .001$),

ERSB Cluster 2: "*mostly engagement-focused*". Caregivers in ER cluster 1 ("all or nothing"), ER cluster 2 ("some of everything"), and caregivers in no ER cluster (posterior probability > 0.80) were all significantly less likely than caregivers in ER cluster 3 ("accept and label") to be in the "mostly engagement-focused" ERSB cluster to regulate their child's emotions. Compared to ER cluster 2 ("accept and label"), ER cluster 1 ("all or nothing") was 21% less likely to be in the "mostly engagement-focused" ERSB cluster (OR = 0.79, 95% CI[1.75 – 1.83], $p < .01$), ER cluster 2 ("some of everything") was 20% less likely to be in the "mostly engagement-focused" ERSB cluster (OR = 0.80, 95% CI[0.77 – 0.84, $p < .001$), and the "no ER cluster" (posterior probability > 0.80) was 11% less likely to be in the "mostly engagement-focused" ERSB cluster (OR = 0.89, 95% CI[0.86 – 0.93, $p < .001$),

ERSB cluster 3: "*mostly no regulation*". Caregivers in ER cluster 1 ("all or nothing") (OR = 1.25, 95% CI[0.19 – 0.30, $p < .001$) and the "no ER cluster" (OR = 1.05, 95% CI[1.01 – 1.08, $p < .05$) were 25% and 5% more likely than caregivers in ER cluster 3 "accept and label" to be in the "mostly no regulation" ERSB cluster, respectively. Caregivers in ER cluster 2 ("mostly some of everything") were 3% less likely to be in the "mostly no regulation" ERSB cluster (OR = 0.97, 95% CI[0.94 – 0.99, $p < .05$).

ERSB cluster 4: "*even class split*". Compared to caregivers in ER cluster 3 ("accept and label"), caregivers in ER cluster 1 ("all or nothing") were 8% less likely to be in ERSB cluster 4 ("even class split"; OR = 0.92, 95% CI[0.88 – 0.96], $p < .001$), and caregivers in ER cluster 2 ("mostly some of everything") were 18% more likely to be in the "even class split" ERSB cluster (OR = 1.18, 95% CI[1.12 – 1.24], $p < .001$). There were no significant differences between ER cluster 3 ("accept and label") and the no ER cluster (posterior probability < 0.80) in their likelihood of being in ERSB cluster 4 ("even class split").

ERSB cluster 5: "*all or nothing*". Compared to caregivers in ER cluster 3 ("accept and label"), caregivers in ER cluster 1 ("all or nothing") were 11% more likely to be in ERSB cluster

5 (“all or nothing”; OR = 1.11, 95% CI[1.05 – 1.17], $p < .001$), and caregivers in no ER cluster (posterior probability < 0.80) were 8% less likely to be in the “all or nothing” ERSB cluster (OR = 0.92, 95% CI[0.87 – 0.96], $p < .001$). There were no significant differences between ER cluster 3 (“accept and label”) and ER cluster 2 (“mostly some of everything”) in their likelihood of being in ERSB cluster 5 (“all or nothing”).

Research Question 2

ER Clusters and ER Success: Mean Difference ANOVA

To assess the association between ER cluster membership and caregiver perceived ER success (e.g., success of regulating their own emotions), I first ran Kruskal-Wallace rank sum non-parametric one-way ANOVAs between ER clusters and caregiver mean caregiver-reported success of regulating their own emotions at each measurement occasion. One-way ANOVA results indicated significant mean differences in caregiver reported ER success across ER clusters ($\chi^2(3, 2466) = 131.22$, $p < .001$). I then ran a Wilcoxon rank-sum test to determine which cluster means differed significantly from one another and corrected for multiple comparisons using the Holm correction. Mean differences between subtests are indicated by superscripts in Table 26. Analyses indicated significantly higher mean success of ER cluster 1 (“all or nothing”, M = 5.39, SD = 0.11) compared to ER cluster 2 (“mostly some of everything”; M = 4.57, SD = 0.11) and caregivers in no ER cluster (M = 4.77, SD = 0.11). There were no significant differences between ER cluster 3 (“accept and label”; M = 4.86, SD = 0.10) and other clusters after adjusting for multiple comparisons.

Table 26.

Mean ER and ERSB Success by Clusters

	Mean ER Success			Mean ERSB Success		
ER clusters	M	SE	df	M	SE	df
ER cluster 1: *"all or nothing"*	5.39^{ab}	0.11	2468	5.56^{abc}	0.10	2468
ER cluster 2: *"mostly s/o every"*	4.57^{a}	0.11	2468	5.05^{a}	0.10	2468
ER cluster 3: *"accept and label"*	4.86	0.10	2468	5.04^{b}	0.09	2468
No ER cluster: *posterior probability < 0.80*	4.77^{b}	0.11	2468	5.17^{c}	0.10	2468
Mean Difference	χ^2 (3, 2561) = 131.22, $p < .001$			χ^2 (3, 2561) = 75.66, $p < .001$		
	Mean ER Success			Mean ERSB Success		
ERSB clusters						
ERSB cluster 1: *"mostly s/o every"*	---	---	---	5.43^{abc}	0.15	2466
ERSB cluster 2: *"mostly engagement"*	---	---	---	5.12^{ad}	0.10	2466
ERSB cluster 3: *"mostly no reg"*	---	---	---	5.49^{de}	1.09	2466
ERSB cluster 4: *"even split"*	---	---	---	4.96^{befg}	0.10	2466
ERSB cluster 5: *"all or nothing"*	---	---	---	5.22^{f}	0.10	2466
No ERSB cluster: *posterior probability < 0.80*	---	---	---	5.21^{cg}	0.10	2466
Mean Difference				χ^2 (5, 2561) = 56.97, $p < .001$		

Note. Significant mean differences between clusters indicated by superscripts.

ER Clusters Predicting ER Success: Linear Regression

Linear regression models to predict caregiver reported ER success from ER cluster violated the assumption of normality and were re-run as bootstrapped linear regression models with 1000 re-sampling iterations. Bootstrapped model confidence intervals were interpreted at the .05, .01, .001 for level of significance. Results from these bootstrapped linear regressions are described below and can be found in Table 27.

Table 27.

Bootstrapped Linear Regression Outcomes: ER Clusters Predicting ER Success

	Bootstrap				
			Confidence intervals		
	Beta coefficient	SD	Upper	Lower	*p*-value (2-tailed)
ER cluster 1: *"all or nothing"*	0.52	0.08	0.69	0.36	.001
ER cluster 2: *"mostly s/of everything"*	-0.30	0.09	-0.13	-0.47	.001
ER cluster 3: *"accept and label"*	---	---	---	---	---

Table 27, continued.

			Bootstrap		
			Confidence intervals		
	Beta coefficient	SD	Upper	Lower	*p*-value (2-tailed)
No ER cluster: *<0.80 class membership*	-0.09	0.08	0.09	-0.27	> .05
Covariates					
Child age	-0.01	-0.02	0.03	-0.06	> .05
Child male	-0.03	0.05	0.08	-0.13	> .05
SES	-0.00	0.00	1.13	-1.32	> .05
EMA compliance	-0.00	0.00	-0.00	-0.01	.05

Bootstrapped linear regression analysis revealed a significant positive association between membership in ER cluster 1 ("all or nothing") and ER success when controlling for child age, gender, income, and survey compliance (β = 0.52, SD = 0.08, 95% CI[0.36 – 0.69], $p < .001$), as compared to the relationship between ER cluster 3 ("accept and label") and ER success.

There was a significant negative association between membership in ER cluster 2 ("mostly some of everything") and ER success when controlling for child age, gender, income, and survey compliance (β = -0.30, SD = 0.09, 95% CI[-0.47 – -0.13], $p < .001$), as compared to the association between the reference group (e.g., ER cluster 3 ["accept and label"]) and ER success. R-squared was not interpreted for bootstrapped analyses given evidence to support the fact that the traditional interpretation of R-squared as the proportion of variance in the dependent variable explained by independent variables is no longer valid given that the re-sampling method creates subsets of the original data (Efron & Tibshirani, 1994).

ER clusters and ERSB success: Mean difference ANOVA

Kruskal-Wallace one-way ANOVA results indicated significant mean differences in caregiver reported ERSB success based on their ER cluster membership ($\chi^2(3, 2468) = 75.66$, $p <$

.001). Wilcoxon rank-sum test with Holm correction indicated significantly higher mean ERSB success for ER cluster 1 (“all or nothing;” M = 5.56, SD = 0.10) compared to ER cluster 2 (“mostly some of everything”; M = 5.05, SD = 0.10), ER cluster 3 (“accept and label”; M = 5.04, SD = 0.09), and the no ER cluster (M = 5.17, SD = 0.10). Significant mean differences after correcting for multiple comparisons are indicated by superscripts in Table 26.

ER clusters and ERSB success: linear regression

Linear regression models predicting caregiver reported ERSB success from caregiver ER cluster violated the assumption of normality and were re-run as bootstrapped linear regression models with 1000 re-sampling iterations. Bootstrapped model confidence intervals were interpreted at the .05, .01, .001 level of significance. Results from these bootstrapped linear regressions are described below and can be found in Table 28.

Table 28.

Bootstrapped Linear Regression Outcomes: ER Clusters Predicting ERSB Success

	Bootstrap				
			Confidence intervals		
	Beta coefficient	SD	Upper	Lower	*p*-value (2-tailed)
ER cluster 1: *“all or nothing”*	0.53	0.08	0.68	0.38	.001
ER cluster 2: *“mostly s/of everything”*	0.02	0.08	0.18	-0.14	> .05
ER cluster 3: *“accept and labels”*	---	---	---	---	---
No ER cluster: *>0.80 class membership*	0.13	0.08	0.29	-0.03	> .05
Covariates					
Child age	0.06	0.02	0.10	0.02	.001
Child male	-0.08	0.05	0.02	-0.17	> .05
SES	-0.00	0.00	0.00	-0.00	> .05
EMA compliance	-0.00	0.00	-0.00	-0.01	.05

Bootstrapped linear regression analysis revealed a significant positive association between membership in ER cluster 1 (“all or nothing”) and ERSB success while controlling for child age, gender, income, and survey compliance (β = 0.53, SD = 0.08, 95% CI[0.38 – 0.68], *p*

< .001). Specifically, the positive relationship between the "all or nothing" cluster membership and ERSB success was stronger than the relationship between ERSB success and the reference group, ER cluster 3 ("accept and label").

The associations between ER cluster 2 ("mostly some of everything") and no ER cluster (posterior probability < 0.80) and ERSB success was not significantly different from the relationship between the "accept and label" ER cluster and ERSB success when controlling for child age, gender, income, and survey compliance.

ERSB clusters and ERSB success: Mean difference ANOVA

Kruskal-Wallace one-way ANOVA results indicated significant mean differences in caregiver reported ERSB success based on their ERSB cluster membership ($\chi^2(3, 2466) = 56.97$, $p < .001$). Wilcoxon rank-sum test indicated that ERSB cluster 3 ("mostly no regulation") had the highest mean ERSB success of all ERSB clusters (M = 5.49, SD = 0.09). Mean success of the "mostly no regulation" cluster was significantly higher than the mean success of ER cluster 2 ("mostly engagement focused"; M = 5.12, SD = 0.10), ER cluster 4 ("even class split"; M = 4.96, SD = 0.10). ER cluster 4 ("even class split") had the lowest mean success (M = 4.96, SD = 0.10), and was significantly lower than all other ERSB clusters after correcting for multiple comparisons. ERSB cluster 1 ("mostly some of everything") had the second highest mean success (M = 5.43, SD = 0.15) after the "mostly no regulation" cluster. The mean success of ERSB cluster 1 ("mostly some of everything") was significantly higher than the mean success of caregivers in ERSB cluster 2 ("mostly engagement-focused"), ERSB cluster 4 ("even class split") and the no ERSB cluster (posterior probability < 0.80; M = 5.21, SD = 0.10) after correcting for multiple comparisons.

ERSB clusters and ERSB success: linear regression

Linear regression models predicting caregiver reported ERSB success from caregiver ERSB regulation cluster violated the assumption of normality and were re-run as bootstrapped linear regression models with 1000 re-sampling iterations. Bootstrapped model confidence intervals were interpreted at the .05, .01, .001 for level of significance. Results from these bootstrapped linear regressions are described below and can be found in Table 29.

Table 29.

Bootstrapped Linear Regression Outcomes: ERSB Clusters Predicting ERSB Success

	Bootstrap				
			Confidence Intervals		
	Beta coefficient	SD	Upper	Lower	*p*-value (2-tailed)
ERSB cluster 1: *"mostly some of everything"*	0.31	0.15	0.60	0.01	.05
ERSB cluster 2: *"mostly engagement-focused"*	---	---	---	---	---
ERSB cluster 3: *"mostly no regulation"*	0.37	0.09	0.55	0.18	.001
ERSB cluster 4: *"even class split"*	-0.16	0.10	0.02	-0.36	> .05
ERSB cluster 5: *"all or nothing"*	0.10	0.09	0.28	-0.08	> .05
No ERSB cluster: < *0.80 cluster membership*	0.09	0.09	0.27	-0.09	> .05
Covariates					
Child age	0.08	0.02	0.13	0.04	.001
Child male	-0.08	0.05	0.03	-0.16	> .05
SES	-0.00	0.00	0.00	-0.00	> .05
EMA compliance	-0.00	0.00	-0.01	-0.00	.05

Bootstrapped linear regression analysis revealed a significant positive association between ERSB cluster 3 ("mostly no regulation") and caregiver reported ERSB success, when controlling for child age, gender, income, and survey compliance (β = 0.37, SD = 0.09, 95% CI[0.18 – 0.55], p < .001), specifically as compared to ERSB cluster 2 ("mostly engagement-focused"). Analyses also revealed a significant positive association between ERSB cluster 1 ("mostly some of everything") on ERSB success when controlling for child age, gender, income, and survey compliance (β = 0.31, SD = 0.15, 95% CI[0.05– 0.60], p < .05), as compared to ERSB cluster 2 ("mostly engagement-focused"). The associations between cluster 4 ("even class split"), cluster 5 ("all or nothing"), and no ERSB cluster (posterior probability < 0.80) and ERSB success were not significantly different from ERSB cluster 2 ("mostly engagement-focused").

Research Question 3

Main effect of child lability on regulation success

Before addressing the question of whether child lability moderates the association between caregiver regulation cluster and caregiver regulation success, I first ran linear regressions between child lability and both ER and ERSB success to determine whether there was a main effect of child lability on ER and ERSB success. Both regression models violated the assumption of normality and were re-run as bootstrapped linear regression models with 1000 re-sampling iterations. Bootstrapped model confidence intervals were interpreted at the .05, .01, .001 for level of significance. There were significant main effects of child lability on ER success, β = -0.10, SD = 0.02, 95% CI[-0.14 – -0.05], p < .001, and on ERSB success, β = -0.11, SD = -0.19, 95% CI[-0.15 – -0.07], p < .001, while controlling for child age, child gender, income, and survey compliance. Results available in Table 30.

Table 30.

Bootstrapped Linear Regression: Child Lability Predicting ER and ERSB Success

	Bootstrap				
			Confidence intervals		
	Beta coefficient	SD	Lower	Upper	*p*-value (2-tailed)
ER success	**-0.10**	**0.02**	**-0.14**	**-0.05**	**.001**
Child age	0.03	0.03	-0.02	0.07	>.05
Child male	-0.04	0.06	-0.15	0.08	>.05
Income	-0.00	0.00	-0.00	0.00	>.05

Table 30, continued

	Bootstrap				
			Confidence intervals		
	Beta coefficient	SD	Lower	Upper	*p*-value (2-tailed)
ERSB success	**-0.11**	**-0.19**	**-0.15**	**-0.07**	**.001**
Child age	0.09	0.02	0.05	1.13	.001
Child male	-0.08	0.05	-0.17	0.02	>.05
Income	-0.00	0.00	-1.25	2.96	>.05
Survey compliance	-0.00	0.00	-0.00	0.00	.001

Regression results: Interaction of Child Lability and ER Cluster on ER Success

Results from the bootstrapped linear regression of the interaction between child lability and ER cluster on ER success is depicted in Table 31, and a visual representation is available in Figure 5. No ER cluster and child lability interaction coefficients differed significantly from the reference group interaction (e.g., "accept and label" by lability on success) while controlling for child age, child gender, income, and survey compliance.

Table 31.

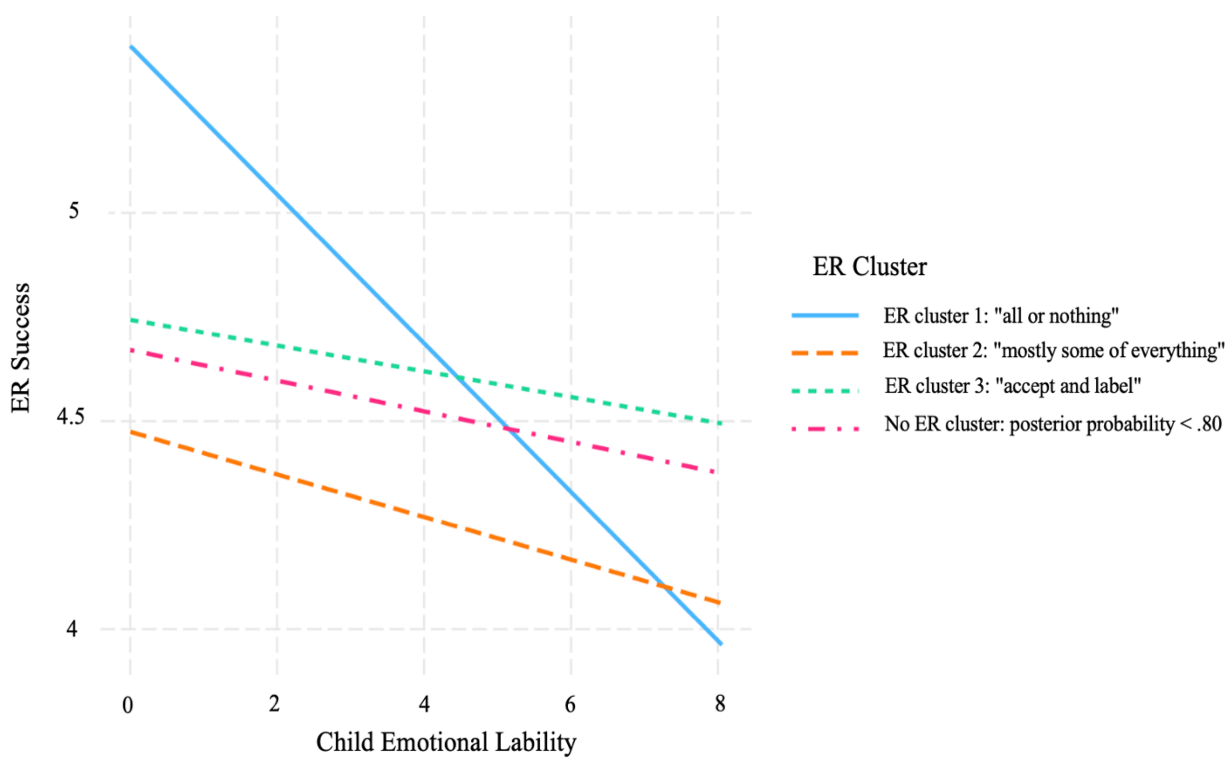
Bootstrapped Linear Regression: Interaction between Child Lability and Negative ER Cluster on ER Success

	Bootstrap				
			Confidence intervals		
	Beta coefficien t	SD	Upper	Lower	*p*-value (2-tailed)
ER cluster 1 * lability: *"all or nothing"*	-0.15	0.09	0.024	-0.31	> 0.05
ER cluster 2 * lability: *"mostly some of everything"*	-0.02	0.09	0.158	-0.19	> 0.05
ER cluster 3 * lability: *"accept and labes"*	---	---	---	---	---
No ER cluster * lability: *posterior probability < 0.80*	-0.01	0.08	0.147	-0.17	> 0.05
Covariates					
Child age	-0.01	0.02	0.04	-0.05	> 0.05
Child male	-0.00	0.06	0.12	-0.11	> 0.05
Income	-0.00	0.00	-0.00	-0.00	0.05
EMA compliance	-0.00	0.00	-0.00	-0.01	0.05

Pairwise comparisons using Holm correction were run to observe the model's estimated marginal means. The negative slope between child lability in ER cluster 1 ("all or nothing") on ER success was significant (β = -0.18, SE = 0.05, 95% CI[-0.28, -0.08]), indicating that, as child lability increased, ER success significantly decreased among caregivers in the "mostly no regulation" cluster. Slopes were not significant for any other ER cluster. There were no significant contrasts in marginal mean slopes between clusters, indicating that the impact of child lability on the relationship between ER cluster and ER success did not differ significantly between clusters.

Figure 5.

Interaction between Child Lability and ER Cluster on ER Success



Regression results: Interaction of Child Lability and ER Cluster on ERSB Success

Results from the bootstrapped linear regression of the interaction between child lability and ER cluster on ERSB success is depicted in Table 32, and a visual representation is available in Figure 6. No bootstrapped ER cluster and child lability interaction coefficients were differed significantly from the reference group interaction (e.g., "accept and label" by lability on success) while controlling for child age, child gender, income, and survey compliance.

Table 32.

Bootstrapped Linear Regression: Interaction between ER Cluster and Lability on ERSB Success

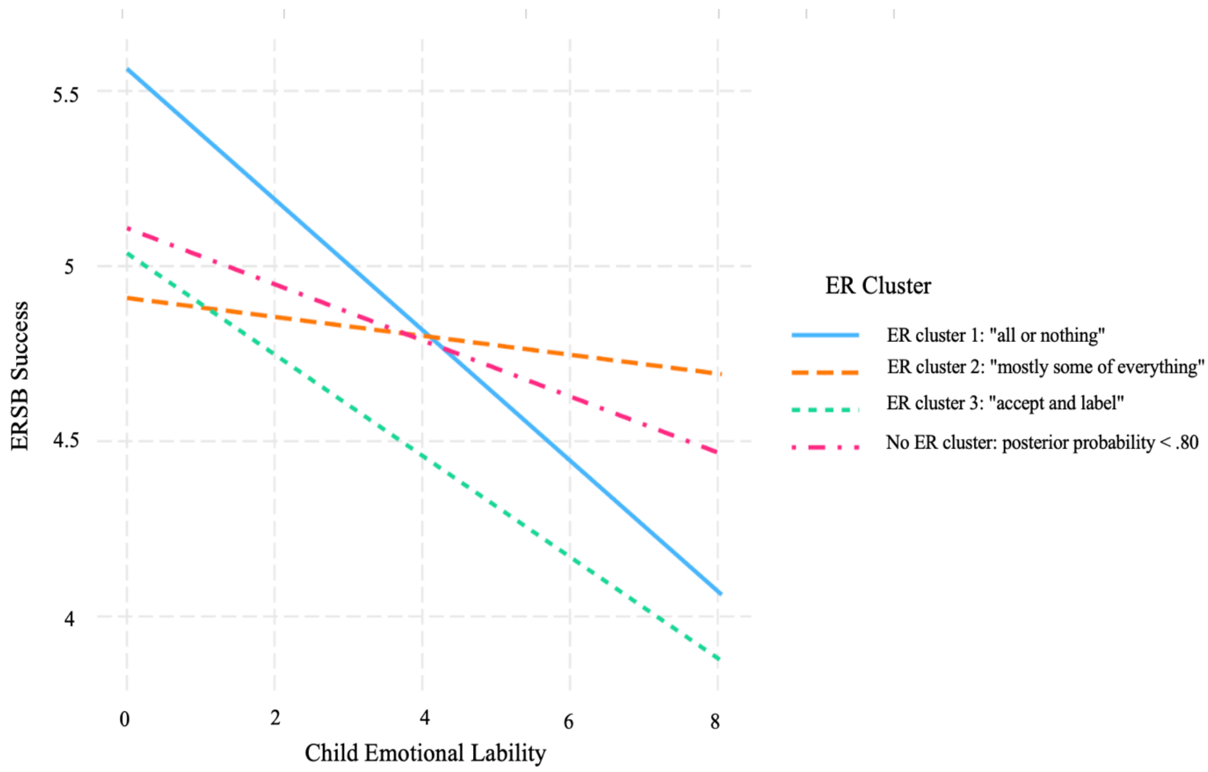
	Bootstrap				
			Confidence intervals		
	Beta coefficient	SD	Upper	Lower	*p*-value (2-tailed)
ER cluster 1 * lability: *"all or nothing"*	-0.04	0.09	0.13	-0.10	> .05
ER cluster 2 * lability: *"mostly s/of everything"*	0.12	0.10	0.30	-0.07	> .05
ER cluster 3 * lability: *"accept and labelers"*	---	---	---	---	---
No ER cluster * lability: *posterior probability >0.80*	0.06	0.09	0.28	-0.14	> .05
Covariates					
Child age	0.07	0.02	0.11	0.027	.001
Child male	-0.06	0.05	0.04	-0.15	> .05
SES	-0.00	0.00	-3.64	-1.25	.05
EMA compliance	-0.00	0.00	0.00	-0.01	> .05

Pairwise comparisons using Holm correction were run to observe the model's estimated marginal means. The slope between child lability in ER cluster 1 ("all or nothing") on ERSB success was significant (β = -0.19, SE = 0.05, 95% CI[-0.27, -0.10]), indicating that there was a significant negative relationship between child lability and ERSB success among caregivers who reported not regulating their own emotions or using all strategies to regulate their emotions.

I then observed marginal mean contrasts, which allows for observation of whether the impact of child lability on the relationship between ER cluster and ERSB success differed significantly between clusters. The slope of ER cluster 1 (“all or nothing”) and child lability was significantly different from the slope of ER cluster 2 (“mostly some of everything”) and ERSB success (β = -0.16, SE = 0.06, p = 0.045), such that while success decreased with increasing child lability for the “all or nothing” ER cluster, increasing child lability did not significantly alter the relationship between the ”mostly some of everything” ER cluster and ERSB success.

Figure 6.

Interaction between Child Lability and ER Cluster on ERSB Success



Regression Results: Interaction of Child Lability and ERSB Cluster on ERSB Success

Results from the bootstrapped linear regression of the interaction between child lability and ERSB cluster on ERSB success while controlling for child age, child gender, income, and survey compliance is shown in Table 33.

Table 33.

Bootstrapped Linear Regression: Interaction between ERSB Cluster and on ERSB Success

			Bootstrap		
			Confidence Intervals		
	Beta coefficient	SD	Lower	Upper	*p*-value (2-tailed)
ERSB cluster 1 * lability: *"mostly s/of everything"*	0.08	0.15	-0.21	0.38	> .05
ERSB cluster 2 * lability: *"mostly engagement"*	---	---	---	---	---
ERSB cluster 3 * lability: *"mostly no regulation"*	0.13	0.07	0.00	0.27	.05
ERSB cluster 4 * lability: *"even class split"*	0.23	0.09	0.41	0.06	.01
ERSB cluster 5 * lability: *"all or nothing"*	0.07	0.07	-0.06	0.22	> .05
Covariates					
Child age	0.09	0.02	0.05	0.13	.001
Child male	-0.01	0.05	-0.10	0.10	> .05
Income	-0.00	0.00	-1.08	1.44	> .05
EMA compliance	-0.25	0.00	-0.00	0.00	> .05

Results indicated a significant positive interaction between child lability and ERSB cluster 4 ("even class split") on ERSB success ($\beta = 0.23$, SD = 0.09, 95%[CI = 0.06 – 0.41], $p < .01$), compared to the reference group interaction (e.g., "mostly engagement-focused" ERSB cluster and child lability). The positive interaction indicates that the relationship between lability and success differs for caregivers in cluster 4 ("even class split") compared to the other clusters. Specifically, for the "even class split" ERSB cluster, there is no effect of child emotional lability on ERSB success. In contrast, for the "mostly no regulation," "mostly engagement-focused", "all or nothing," and "mostly some of everything" ERSB clusters, ERSB success was lower among caregivers of children with higher emotional lability.

Pairwise comparisons using Holm correction were run to observe the model's estimated marginal means. The negative slope between ERSB cluster 2 ("mostly engagement-focused") and child lability on ERSB success was significant ($\beta = -0.23$, SE = 0.08, 95% CI [-0.37, -0.08], $p < .05$), indicating that ERSB success was significantly lower among caregivers in the "mostly engagement-focused" ERSB cluster with higher-lability children, as compared to the ERSB success of caregivers in the "mostly engagement-focused" ERSB cluster with lower-lability children.

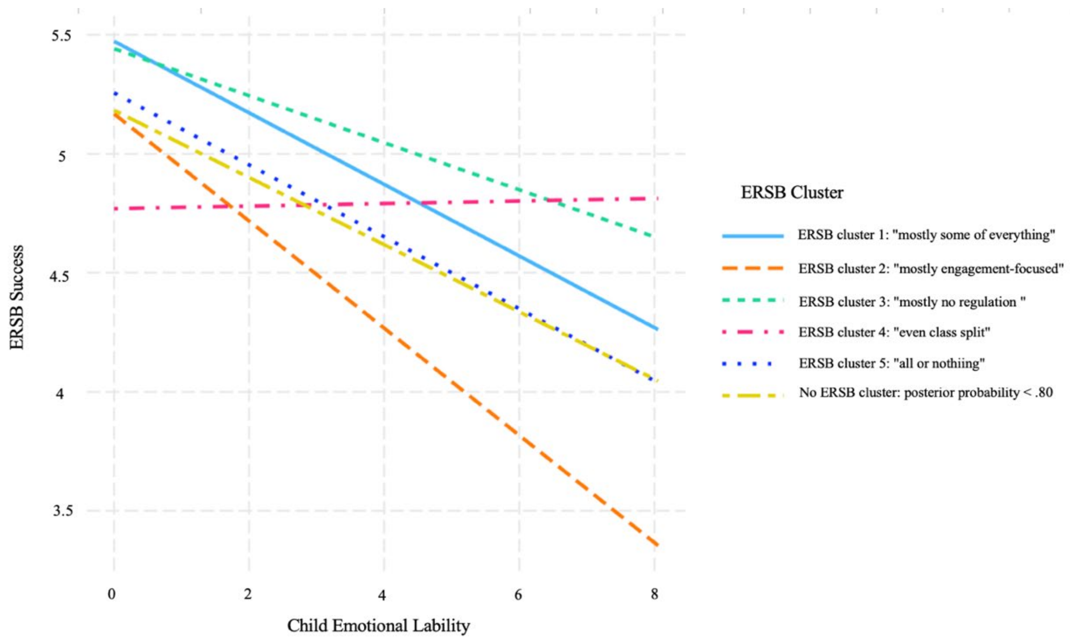
The negative slope between ERSB cluster 3 ("mostly no regulation") and child lability on ERSB success was significant (β = -0.09, SE = 0.03, 95% CI[-0.17, -0.03], $p < .05$), indicating that ERSB success was significantly lower for caregivers in the "mostly no regulation" ERSB cluster with higher-lability children, as compared to the ERSB success of caregivers in the "mostly no regulation" ERSB cluster with lower-lability children.

The negative slope between ERSB cluster 5 ("all or nothing") and child lability on ERSB success was significant (β = -0.15, SE = 0.04, 95% CI[-0.23, -0.08], $p < .05$), indicating that ERSB success was significantly lower for caregivers in the "all or nothing" ERSB cluster with higher-lability children, as compared to the ERSB success of caregivers in the "all or nothing" ERSB cluster with lower-lability children.

Lastly, the negative slope between the no ERSB cluster (posterior probability < 0.80) and child lability on ERSB success was significant (β = -0.14, SE = 0.04, 95% CI [-0.22, -0.06], p < .05), indicating that, among the caregivers whose posterior probability of membership in any other class was less than .80, ERSB success decreased as child lability increased. A visual representation is available in Figure 7.

Figure 7.

Interaction between Child Lability and ERSB Cluster on ERSB Success



Results Summary

Regulation Profiles

Caregiver profiles for regulating their own and their child's emotions (i.e., ER and ERSB) mirrored one another in both their momentary patterns (at the occasion level) and in caregiver use of strategies over time (at the caregiver level). At the occasion level, I identified three classes for ER and ERSBs. Classes for ER and ERSB strategies were similar in that they each included classes characterized by a) use of many regulation strategies, b) use of no strategies, or c) use of a few, engagement-focused strategies. All classes besides the "mostly no regulation" ER and ERSB classes demonstrated caregiver use of multiple ER and ERSB strategies to manage one emotional experience. This result is consistent with the findings of previous EMA work, which shows that in daily life, individuals typically use multiple ER strategies in close proximity to manage emotional experiences (Grommisch et al., 2020; Heiy & Cheavens, 2014).

There were also similarities at the caregiver level. I identified three latent profiles for caregiver ER use, and five latent profiles for caregiver ERSB use. Clusters for ER and ERSB use were similar in both including groups of caregivers who a) predominantly use "no regulation" across measurement occasions, b) predominantly use many strategies across measurement occasions, and c) predominantly use a combination of accepting and labeling emotions, otherwise labeled as "engagement-focused" strategies (although the "mostly engagement-focused" ERSB cluster differed from the "accept and label" ER cluster in that it also included use of reappraisal and social sharing). These groupings are similar to previous EMA research identifying ER profiles of individuals, in which there are often groups who report little regulation (e.g., Eftekhari et al., 2009), and a group who reports using most strategies at moderate frequencies across time (e.g., De France & Hollenstein, 2017; Lougheed & Hollenstein, 2012). Results showed that caregivers were at increased likelihood of regulating their child's emotions with similar combinations of strategies used to regulate their own emotions. This pattern makes sense, given previously documented associations between the strategies caregivers use to regulate their own emotions, and strategies that their children endorse using to regulate their own behaviors (Morris et al., 2007). These findings provide additional support for caregiver socialization behaviors as a pathway through which children develop emotional self-regulation patterns mirroring those of their caregivers (Eisenberg et al., 2018).

In addition to the three overlapping clusters, there were two additional ERSB clusters identified which were not present for ER and included greater diversity in class use across the week. One cluster predominantly used either "no regulation" or a combination of many strategies to regulate their child's emotions across measurement occasions, and one cluster used all three classes of strategy combinations at equal frequencies (e.g., no regulation, some of everything, and accept / label / reappraise / social share). While previous studies have found ER profiles characterized by primarily use of suppressive emotion regulation strategies (e.g., Zalewski et al., 2011), this was not a regulation profile demonstrated in this sample.

Regulation Success

Regarding success, results indicated that caregivers in ER and ERSB clusters characterized by frequent use of “no regulation” reported the greatest mean success of regulating their own and their child’s emotions. This finding may be understood considering shifting contextual demands as a key variable in understanding regulation efficacy (Bonanno & Burton, 2013). The perceived success of the “no regulation” clusters likely reflects the behavioral and emotional context of the sample and may not translate to samples with greater variability in context. Caregivers in this sample reported low frequency of caregiver and child negative affect over the course of the week, and low child behavioral difficulty. At most measurement occasions, it was likely not necessary to regulate caregiver and child emotions to cope with the current demands of the caregiving context. These findings would likely differ in a sample of caregivers navigating stronger emotions in themselves and their child that were not as well aligned to their environment.

Regulation Success and Child Lability

Significant interaction coefficients and marginal slopes also support theories of emotion and coping strategy use as being “context bound” (Morris et al., 2018; Bonnano & Burton, 2013;). While the predominantly “no regulation” ER and ERSB clusters reported the greatest regulation success overall, there were significant negative interactions slopes demonstrating the relationship between the “all or nothing” ER cluster and child lability on ER and ERSB success, as well as the slopes between the “mostly no regulation” ERSB cluster and ERSB success. In other words, caregivers in the “all or nothing” ER cluster (e.g., those who endorse not using any strategies to regulate their own emotions 57% of the time or using many strategies 30% of the time) who have children with highly labile emotions reported less ERSB success than caregivers of children of children with less labile emotions. This same negative trend was seen for caregivers in the “no regulation” ERSB cluster (e.g., those who typically endorsed not using any strategies to regulate their child’s emotions). These findings underscore the importance of factoring child temperament and baseline emotional reactivity into conceptualizations of what effective coping looks like in caregivers of young children (Morris et al., 2007).

There was also a significant interaction between child lability and the “even class split” ERSB cluster on ERSB success, suggesting that this may be an effective cluster for caregivers of labile children as compared to other ERSB clusters. Specifically, caregivers in the “even class split” ERSB cluster, a socialization cluster characterized by caregiver use of a high diversity of regulation strategy combinations over the course of the week, reported stable levels of ERSB success with increasing levels of child lability. In contrast, every other ERSB cluster reported decreases in success at higher levels of child lability. This finding may be understood in the context of literature speaking to the value of *categorical variability* in coping strategies, which posits that individuals who have endured highly aversive or traumatic life events over extended time scales may benefit by developing competence with a broad variety of coping approaches (Bonnano & Burton, 2013). A study using the Perceived Ability to Cope with Trauma (PACT) scale demonstrated this phenomenon. In their sample of Israeli students with shared trauma related to terrorist violence exposure, those who endorsed greater flexibility in their use of engagement and disengagement strategies across situations endorsed fewer and less intense posttraumatic stress symptoms than those who endorsed less flexibility in coping (Bonanno et al., 2011). Similar to the 'more flexible' individuals in this study, caregivers in the "even split" ERSB class are those who endorsed flexible use of both engagement and disengagement strategies to respond to their child's emotions throughout the week. While this combination was reported as less helpful than other clusters for successfully regulating children with low levels of emotional lability, for managing children with highly variable emotional experiences, flexible use of strategies that both engage and disengage with child emotions appears to be an asset.

Exploratory Analyses

Given these considerations around the role of a predominantly neutral or positive emotional context in driving these outcomes, I ran additional exploratory models excluding timepoints in which caregivers reported a positive emotion for themselves. The remaining negative affect sample included 704 measurement occasions completed by 147 caregivers.

Statistical power in multilevel modeling has been shown to be more impacted by number of individuals than number of measurement occasions (Bolger & Laurenceau, 2013). As such, the sample size of N = 180 participants has been noted as a minimum number of participants needed to detect relationships with an alpha-level of .01 and power of .80. However, other simulation studies have demonstrated that a sample of 100 units on level 2 (e.g., 100 individual participants) across different Level 1 sample sizes and class separation indices (i.e., entropy) was able to correctly estimate the number of latent classes in 89% of replications (Lukocienë et al., 2010). Based on these models, a Level 2 (e.g., Caregiver N) sample size of 147 with a range of level 1 measurement occasions across individuals (range = 1–16) was deemed sufficient to apply LCA models, given the condition that model fit indicated sufficient separation between classes.

I thus moved forward with exploratory analyses which aimed to answer the questions of (1) how caregivers of preschool children regulate their and their child's emotions in the context of negative caregiver emotions, (2) are there significant differences in ER and ERSB success between caregiver ER and ERSB clusters in the context of negative caregiver emotions, and (3) are the relationships between ER / ESRB classes and ER / ERSB success moderated by child emotional lability?

Exploratory Research Question 1

Caregiver Negative ER Latent Class Models

Level 1 (Occasion Level) Negative ER Classes. I followed the same process as the original LCA models to identify the best fitting negative ML-LCA models at the occasion and caregiver level. Table 34 shows the fit statistics for Level 1 (measurement occasion level) LCA models which ignore the multilevel structure of the data. The AIC increased steadily from the two to five lass occasion-level models. BIC values also increased beyond two class model. Class separation was acceptable for all models (e.g., greater than .87) and grew strong with increasing classes. A three-class model was chosen to strike a balance between increasing AIC and BIC values, decreasing degrees of freedom, and improving class separation with increasing classes.

Table 34.

Level 1 and 2 Negative ER Latent Class Analysis Fit Statistics

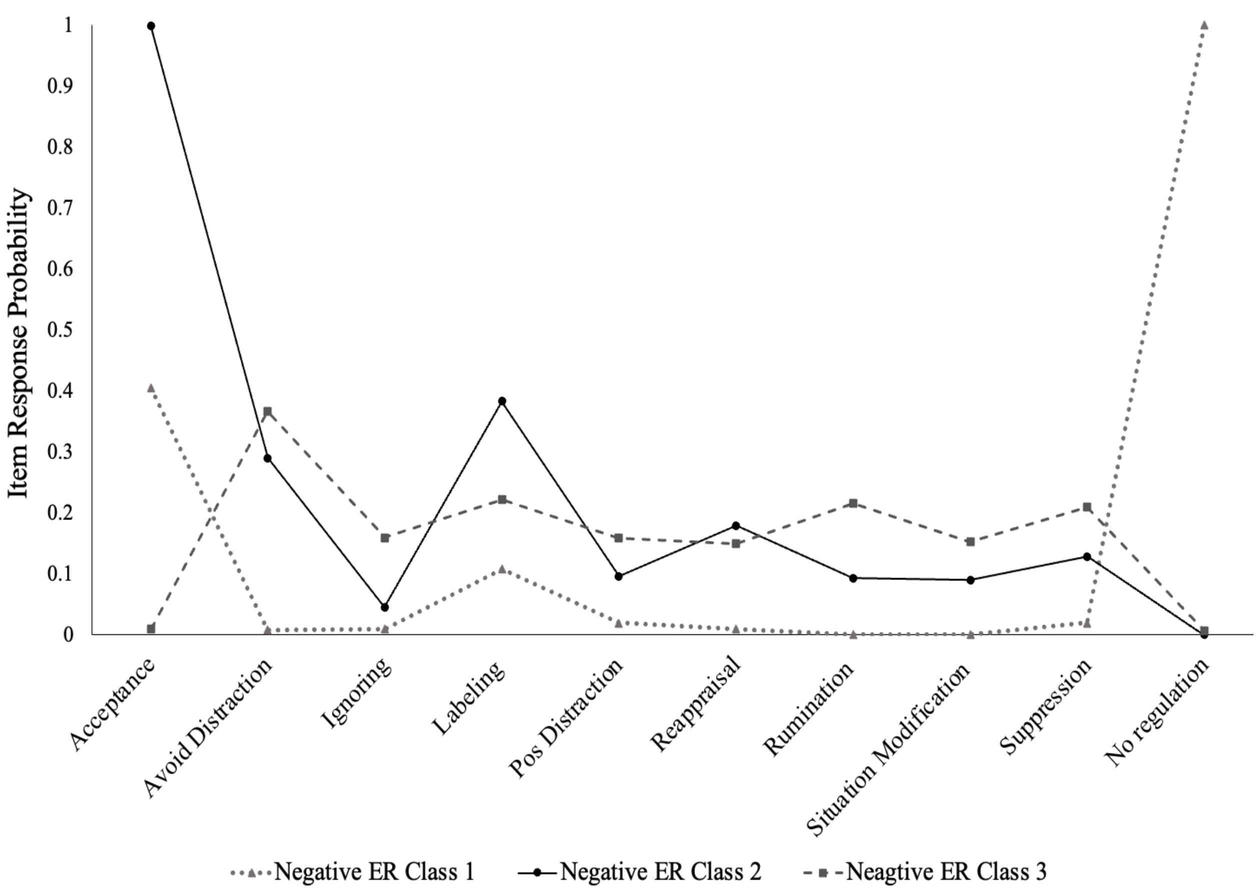
Number of classes	AIC	BIC	df	Entropy
Level 1 (Occasion Classes)				
Two	6275.94	7117.89	514	0.87
Three	**6290.20**	**7928.59**	**339**	**0.91**
Four	6373.74	8808.57	164	0.93
Five	6497.90	9729.17	-11	0.97
Level 2 (Caregiver Clusters)				
Two	**6114.63**	**6273.92**	**664**	**0.97**
Three	6113.72	6286.66	661	0.83
Four	6107.08	6293.67	658	0.96
Five	6107.08	6355.93	655	0.96

Note. The best-fitting solution is highlighted in bold

Figure 8 displays item response probabilities for each ER strategy across measurement occasion given class. **Negative ER class 1** is characterized by occasions in which caregivers indicated use of primarily no regulation (1.00) of their own negative emotions. **Negative ER class 2** is characterized by occasions in which caregiver reported using primarily acceptance (0.99) in combination with labeling (0.38), avoidant distraction (0.29), and reappraisal (0.18). **Negative ER class 3** is characterized by occasions in which caregivers primarily reported using a mix of several strategies, including avoidant distraction (0.37), ignoring (0.16), labeling (0.22), positive distraction (0.16), reappraisal (0.15), rumination (0.22), situation modification (0.15), and suppression (0.21).

Figure 8.

Item Response Probabilities for Level 1(Measurement Occasion) Negative ER Classes

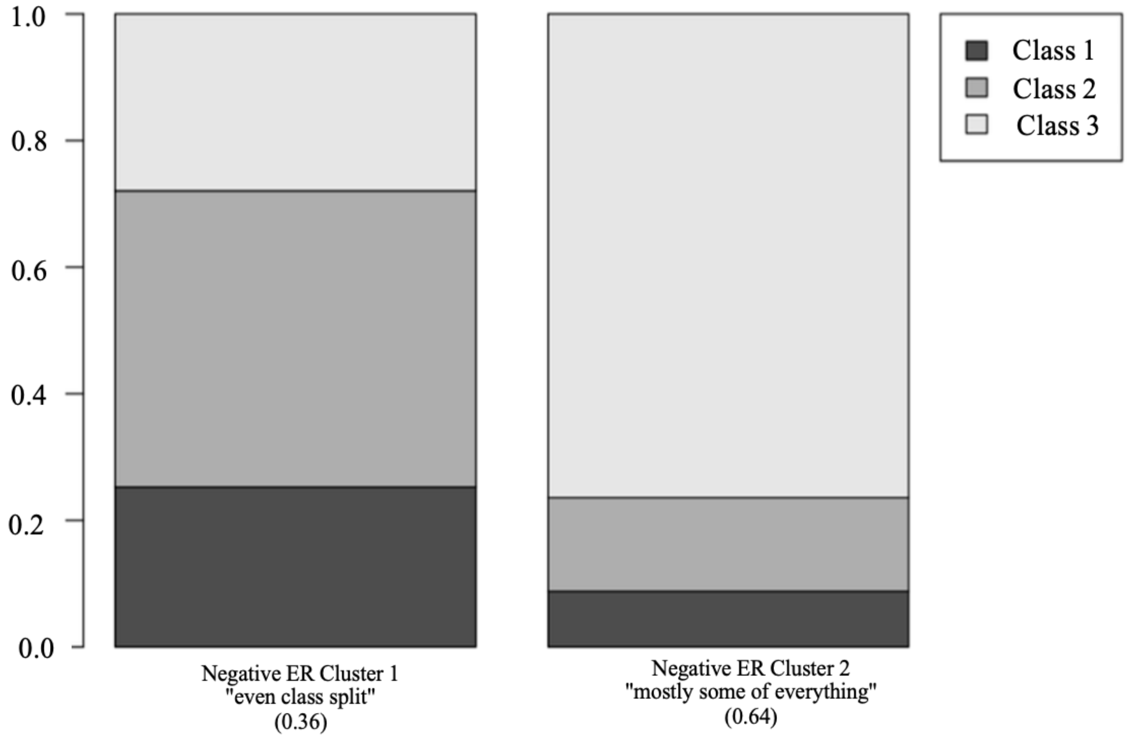


Level 2 (Caregiver Level) Negative ER Clusters. At Level 2, I then determined the optimal number of negative ER clusters. Clusters reflect groups individuals who differ together in their use of occasion-level regulation classes over time. Table 34 shows the fit statistics for a series of ML-LCA models fit with three Level 1 classes and two to five Level 2 clusters. The AIC decreases as number of classes increases, but the BIC increases with added clusters. Degrees of freedom and class separation was strongest for the two-cluster model (entropy = 0.97). Based on these fit indices, I moved forward with a three-class, two cluster model.

Figure 9 displays Level 1 negative ERSB class prevalences by Level 2 negative ERSB clusters. **Negative ER cluster 1** comprised 36% of caregivers in the sample. The ER use of caregivers in cluster 1 is characterized by an even split between using class 1 ("no regulation"), class 2 ("accept and label"), and class 3 ("mix of all strategies"). I accordingly labeled negative ER cluster 1 the *"even class split"* cluster. **ER cluster 2** comprised 64% of caregivers in the sample. The ER use of caregivers in negative ER cluster 2 is characterized by primarily use of class 3 ("mix of all strategies"; 0.76). I labeled negative ER cluster 2 the *"mostly some of everything"* cluster, given their tendency to use a variety of strategies across measurement occasions.

Figure 9.

Level 1 (Measurement Occasion) ER Class Prevalences by Level 2 (Caregiver) ER Clusters



Negative ER Cluster Covariates. Negative ER cluster covariates are displayed in Table 35. Logistic regressions violated the assumption of heterogeneity, so statistics were computed using bootstraps with 1000 iterations. Confidence intervals interpreted to determine significance at the $p < .05$, .01, and .001 level, based on two-tailed significance values.

Table 35.

Bootstrapped Logistic Regression: Negative ER Cluster Membership by Covariates

	Bootstrap			
	Beta coefficient	SD	Odds Ratios (95% CIs)	*p*-value (2-tailed)
ER cluster 1: "Even class split"				
Child age	-0.06	0.01	0.95 (0.92 – 0.97)	.001
Child male	0.02	0.03	1.02 (0.95 – 1.00)	> .05
Income	-0.00	0.00	0.99 (0.99 – 0.99)	.001
EMA compliance	0.00	0.00	1.00 (0.99 – 1.00)	.001

Table 35, continued

	Beta coefficient	SD	Bootstrap Odds Ratios (95% CIs)	*p*-value (2-tailed)
ER cluster 2: "Mostly some of everything"				
Child age	0.08	0.02	1.09 (1.05 – 1.12)	.001
Child male	-0.04	0.04	0.96 (0.89 – 1.03)	> .05
Income	0.00	0.00	1.00 (1.00 – 1.00)	.001
EMA compliance	0.00	0.00	1.00 (1.00 – 1.00)	.05

Based on the bootstrapped logistic regression analysis, child age was found to be a significant predictor of negative ER Cluster 1 ("even class split"), with each one-unit increase in child age decreasing the odds of belonging to the "even class split" cluster by 5% (OR = 0.95, 95% CI[0.92, 0.97], $p < .001$). Child age was also found to be a significant predictor of Cluster 2 ("mostly some of everything"; OR = 1.09, 95% CI[0.05, 0.12], $p < .001$), with each one-unit increase in child age increasing the odds of belonging to the "mostly some of everything" cluster by 9%. For ER Cluster 2 ("mostly some of everything"), with each percent increase in survey compliance was associated with a 0.2% increase in the odds of belonging to "some of everything" (OR = 1.002, 95% CI[1.000, 1.005], $p < .001$).

Income was a significant predictor of membership both clusters. For negative ER cluster 1 ("even class split"), with each $1 increase in income decreasing odds of membership in cluster 1 by 0.01% (OR = 0.999, 95% CI[0.999 – 0.999], $p < .001$). For negative ER cluster 2 ("mostly some of everything"), with each $1 increase in income increasing the odds of membership in cluster 2 by 0.01% (OR = 1.0001, 95% CI[1.000 – 1.0001], $p < .001$).

Negative Caregiver ERSB Multi-Level Latent Class Models

Level 1 (Occasion Level) Negative ERSB Classes. I followed the same process as the original LCA models to identify the best fitting negative ML-LCA models at the occasion and caregiver level. Table 36 shows the fit statistics for Level 1 (occasion level) LCA models which ignore the multilevel structure of the data. The AIC decreased from the one to two class model and increased from three to five classes. BIC increased beyond the two-class model. Class separation was acceptable for all models but grew stronger with increasing classes. A three-class model was chosen to maximize AIC and BIC fit.

Table 36.

Level 1 and 2 Negative ERSB Latent Class Analysis Fit Statistics

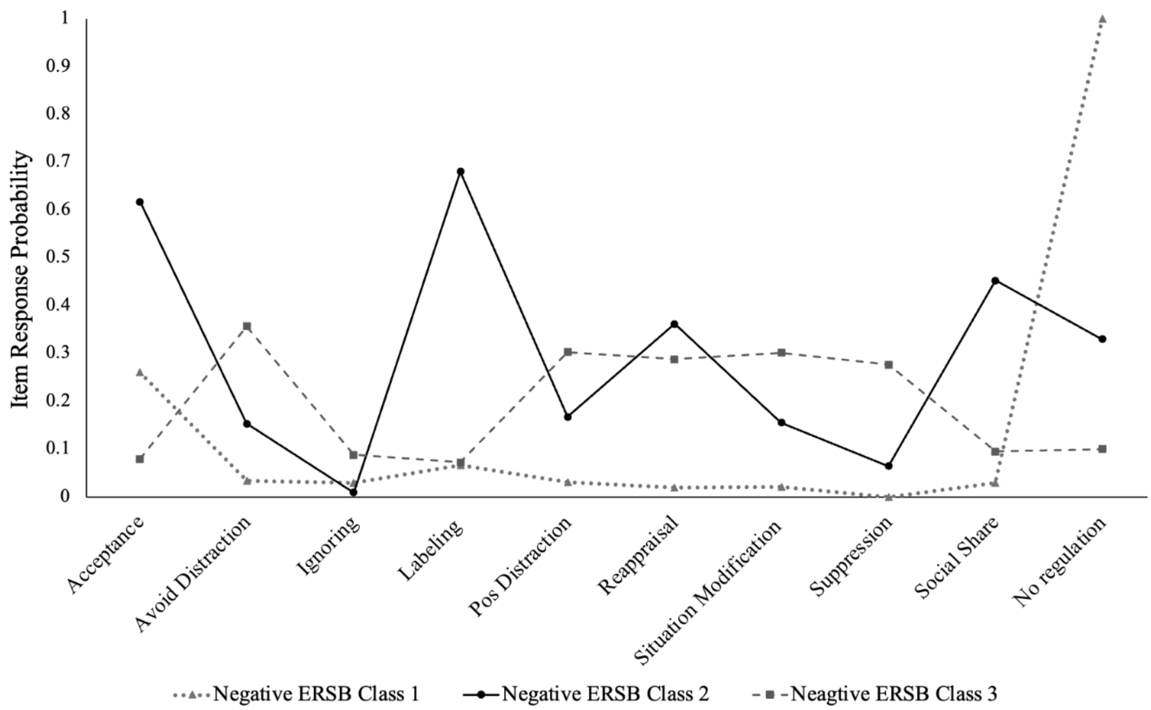
Number of classes	AIC	BIC	df	Entropy
Level 1 (Occasion Classes)				
Two	5687.40	6530.40	518	0.88
Three	**5648.72**	**7289.16**	**343**	**0.88**
Four	5784.01	8221.89	168	0.91
Five	5990.34	9225.65	-7	0.93
Level 2 (Caregiver Clusters)				
Two	5483.58	5643.07	668	0.79
Three	**5472.80**	**5645.96**	**665**	**0.80**
Four	5476.09	5662.92	662	0.80
Five	5482.09	5682.58	659	0.80

Note. The best-fitting solution is highlighted in bold

Figure 10 displays item response probabilities for each ERSB strategy across measurement occasion given class membership. **Negative ERSB class 1** is characterized by occasions in which caregivers indicated use of primarily no regulation (1.00) of their child's negative emotions. **Negative ERSB class 2** is characterized by occasions in which caregiver reported using primarily labeling (0.68) and acceptance (0.62), in combination with reappraisal (0.36), social and social sharing (0.45), and no regulation (0.33). **Negative ERSB class 3** is characterized by occasions in which caregivers primarily reported using a mix of several strategies, including avoidant distraction (0.36), positive distraction (0.30), reappraisal (0.29), rumination (0.22), situation modification (0.30), and suppression (0.28).

Figure 10.

Item Response Probabilities for Level 1(Measurement Occasion) Negative ER Classes



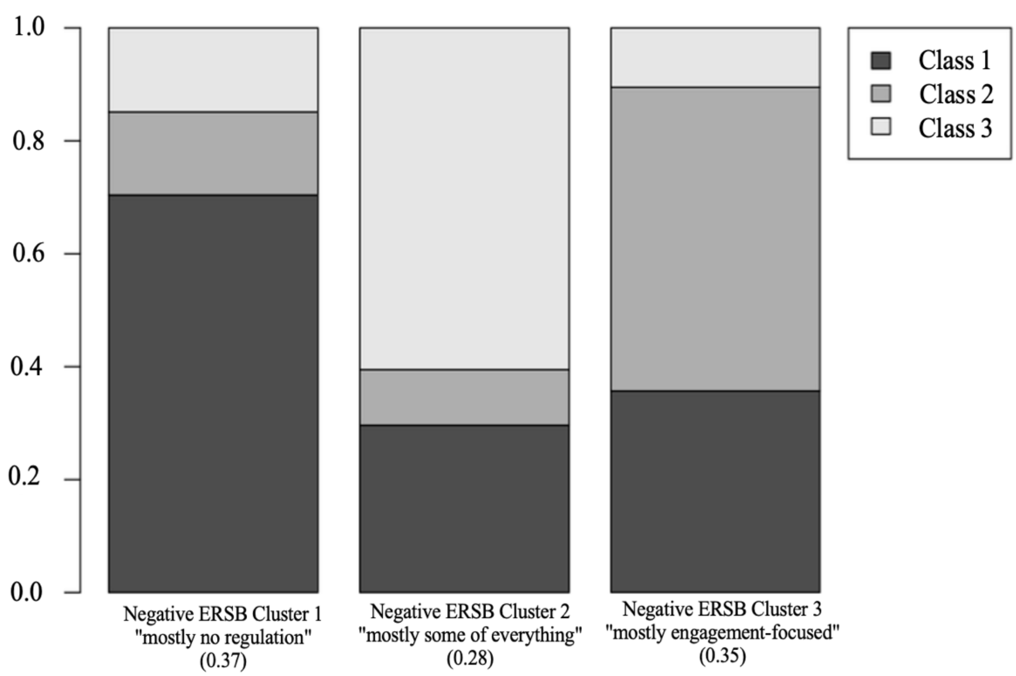
Level 2 (Caregiver Level) Negative ERSB Clusters. At Level 2, I then determined the optimal number of caregiver clusters. Clusters reflect groups individuals who differ together in their use of occasion-level regulation classes over time. Table 36 shows the fit statistics for a series of ML-LCA models fit with three Level 1 classes and two to five Level 2 clusters. The AIC decreases from two to three classes, then increases to 5 classes. BIC value increase minimally from two to three clusters, then more significantly with added clusters. Degrees of freedom and class separation was strongest for three through five cluster models (entropy = 0.80). Based on these fit indices, I moved forward with a three-class, three cluster model.

Figure 11 displays Level 1 negative ERSB class prevalences by Level 2 negative ERSB clusters. **Negative ERSB cluster 1** comprised 37% of caregivers in the sample. The ERSB use of caregivers in cluster 1 is characterized by primarily use of ERSB class 1 (“no regulation”;

70%). I accordingly labeled negative ER cluster 1 the *"mostly no regulation"* cluster. **Negative ERSB cluster 2** comprised 28% of caregivers in the sample. The ERSB use of caregivers in negative ERSB cluster 2 is characterized by primarily use of class 3 ("mix of all strategies"; 0.61), with some of class 1 ("no regulation"; 0.30). I labeled negative ERSB cluster 2 the *"mostly some of everything"* cluster, given their tendency to use a variety of strategies across measurement occasions. **Negative ERSB cluster 3** comprised 35% of caregivers in the sample. The ERSB use of caregivers in negative ERSB cluster 2 is characterized by primarily use of class 2 (labeling, acceptance, reappraisal social sharing; 0.54), with some of class 1 ("no regulation"; 0.35). I labeled negative ERSB cluster 3 the *"mostly engagement-focused"* cluster.

Figure 11.

Level 1 (Measurement Occasion) ERSB Class Prevalences by Level 2 (Caregiver) ERSB Clusters



Negative ERSB cluster covariates. Negative ERSB cluster covariates are displayed in Table 37. Logistic regressions violated the assumption of heterogeneity, so statistics were computed using bootstraps with 1000 iterations. Confidence intervals interpreted to determine significance at the $p < .05$, .01, and .001 level, based on two-tailed significance values.

Table 37.

Bootstrapped Logistic Regressions: Negative ERSB Cluster Membership by Covariates

	Beta coefficient	SD	Bootstrap Odds Ratios (95% CIs)	*p*-value (2-tailed)
ERSB cluster 1: "m*ostly no regulation*"				
Child age	0.02	0.01	1.02 (1.00 – 1.04)	.05
Child male	-0.04	0.03	0.95 (0.90 – 1.01)	>.05
Income	0.00	0.00	1.00 (0.99 – 1.00)	>.05
EMA compliance	0.00	0.00	1.00 (1.00 – 1.00)	.001
ERSB cluster 2:*"mostly some of everything"*				
Child age	0.06	0.01	1.06 (1.03 – 1.09)	.001
Child male	0.11	0.01	1.12 (1.06 – 1.18)	.001
Income	-0.00	0.00	0.99 (0.99 – 1.00)	>.05
EMA compliance	0.00	0.00	1.00 (1.00 – 1.00)	.001
ERSB cluster 3:*"mostly engagement-focused"*				
Child age	-0.04	0.01	0.96 (0.94 – 0.99)	.001
Child male	0.01	0.03	1.01 (0.95 -1.07)	>.05
Income	0.00	0.00	1.00 (1.00 -1.00)	.001
EMA compliance	0.00	0.00	1.00 (1.00 1.00)	.001

Based on the bootstrapped logistic regression analysis, child age was found to be a significant predictor of all three negative ERSB clusters. For cluster 1 ("mostly no regulation"), each one-unit increase in child age increased the odds of belonging to the "mostly no regulation" cluster by 2% (OR = 1.02, 95% CI[1.00, 1.04], $p < .05$). For cluster 2 ("mostly some of everything"), each one-unit increase in child age increased the odds of belonging to the "some of everything" cluster by 6% (OR = 1.060, 95% CI[0.032, 0.094], $p < .001$). For cluster 3 ("mostly engagement-focused"), each one-unit increase in child age decreased the odds of belonging to the "mostly engagement-focused" ERSB cluster by 4% (OR = 0.96, 95% CI[0.94 – 0.99], $p < .001$).

Child gender was a significant predictor of membership in negative ERSB cluster 2 (“some of everything”), with male-identified children being at 12% increased odds of being in the “some of everything” cluster compared to female-identified children (OR = 1.12, 95% CI[1.020, 1.21], $p < .001$).

EMA compliance was also a significant predictor of membership in all three clusters. For negative ER cluster 1 (“mostly no regulation”), each percent increase in survey compliance was associated with a 0.2% increase in the odds of belonging to the cluster (OR = 1.002, 95% CI [1.000, 1.002], p < .001). For negative ERSB cluster 2 (“mostly some of everything”), each percent increase in survey compliance was associated with a 0.2% increase in the odds of belonging to the cluster (OR = 1.002, 95% CI[1.000, 1.004], $p < .001$). For negative ERSB cluster 3 (“mostly engagement-focused”), each percent increase in survey compliance was associated with a 0.3% increase in the odds of belonging to the cluster (OR = 1.003, 95% CI[1.000, 1.005], $p < .001$).

Exploratory Research Question 2

Negative ER clusters and ER success: mean difference ANOVA

To assess the association between negative ER cluster membership and caregiver perceived ER success (e.g., success of regulating their own emotions), I first ran Kruskal-Wallace rank sum non-parametric one-way ANOVAs between ER clusters and caregiver mean reported ER success at each measurement occasion. One-way ANOVA results indicated significant mean differences in caregiver reported ER success across negative ER clusters (χ^2(2, 704) = 27.28, $p < .001$). I then ran a Wilcoxon rank-sum test to determine which cluster means differed significantly from one another and corrected for multiple comparisons using the Holm correction. Mean differences between subtests are indicated by superscripts in Table 38 and indicated significantly higher mean success of ER cluster 1 ("even class split"; M = 4.00, SD = 0.12) compared to ER cluster 2 ("mostly some of everything"; M = 3.35, SD = 0.07).

Table 38.

Mean ER and ERSB Success by Negative Clusters

	Mean ER success			Mean ERSB success		
	M	SE	df	M	SE	df
Negative ER clusters						
ER cluster 1: *"even class split"*	4.00^{a}	0.11	660	4.58	0.11	660
ER cluster 2: *"mostly s/of everything"*	3.35^{ab}	0.07	660	4.43	0.07	660
No ER cluster: *posterior probability < .80*	3.77^{b}	0.12	660	4.50	0.13	660
Mean Difference	χ^2 (2, 704) = 27.28, $p < .001$			χ^2 (2, 704) = 1.82, $p = .40$		
Negative ERSB clusters						
ERSB cluster 1: *"mostly no reg"*	---	---	---	4.84^{ab}	0.14	659
ERSB cluster 2: *"mostly s/of every"*	---	---	---	3.78^{acd}	0.14	659
ERSB cluster 3: *"mostly engagement"*	---	---	---	4.30^{bce}	0.12	659
No ERSB cluster: *>0.80 cluster membership*	---	---	---	4.63^{de}	0.07	659
Mean Difference	---	---	---	χ^2 (3, 659) = 36.99, $p < .001$		

Negative ER Clusters and ER Success: Linear Regression

Linear regression models to predict caregiver reported ER success from negative ER cluster met assumptions for linearity, homogeneity of variance, influential observations, collinearity, and normality of residuals. Regressions controlled for child age, child gender, income, and survey compliance. Results are described below and found in Table 39.

Table 39.

Linear Regression: Negative ER Clusters Predicting ER Success

	Beta Coefficient	SD	*p*-value
Intercept	4.86	0.36	<.001
ER cluster 1: *"even class split"*	---	---	---
ER cluster 2: "*mostly some of everything"*	-0.65	0.14	<.001
No ER cluster: *<0.80 class membership*	0.01	0.11	.17

Table 39, continued

	Beta Coefficient	SD	*p*-value
Covariates			
Child age	0.02	0.05	.77
Child male	-0.25	0.11	.02
Income	-0.00	0.05	.69
EMA compliance	-0.00	0.00	.01
	R^2 = 0.06, adjusted R^2 = 0.04, Degrees of Freedom = 660		

Negative ER cluster 1 ("even class split") was the reference group for this linear regression analysis. Results indicated that caregivers in negative ER cluster 2 ("mostly some of everything") were significantly less associated with ER success ($F(6, 660) = -0.65$, SE = 0.14, $p < .001$). This indicates that caregivers in the "some of everything" cluster reported significantly less success at regulating their own negative emotions compared to caregivers in the "even class split" cluster. Similarly, the no negative ER cluster was also negatively associated with ER success ($F(6, 660) = -0.24$, SE = -0.17, $p < .001$) when controlling for covariates. The model predicted 6% of variance in ER success ($R^2 = 0.06$).

There was a significant negative association between caregiver identification of their child as male and perceived success of regulating their own emotions, such that caregiving a male-identified child was associated with decreased negative ER success ($F(6, 660) = -0.25$, SE = -0.11, $p = 0.02$).

The model overall explained a small proportion of the variance in the dependent variable ($R^2 = 0.056$). The F-statistic was statistically significant ($F(6, 660) = 6.56$, $p < .001$), indicating that the regression model overall was a significant predictor of success.

Negative ER Clusters and ERSB Success: Mean Difference ANOVA

Kruskal-Wallace one-way ANOVA results indicated that there were no significant mean differences in caregiver-reported ERSB success of regulating their child's emotions based on their ER cluster membership (χ^2(2, 704) = 1.82, p = .40) (Table 38).

Negative ER Clusters and ERSB Success: Linear Regression

Linear regression models were run to predict caregiver-reported ERSB success of regulating their child emotions from caregiver ER cluster. The model violated the assumption of normality and was re-run as bootstrapped linear regression models with 1000 re-sampling iterations. Bootstrapped model confidence intervals were interpreted at the .05, .01, .001 for level of significance. Results from these bootstrapped linear regressions are described below and can be found in Table 40.

Table 40.

Bootstrapped Logistic Regressions: Negative ER Clusters Predicting ERSB Success

	Bootstrap				
			Confidence intervals		
	Beta coefficient	SD	Lower	Upper	*p*-value (2-tailed)
ER cluster 1: *"even class split"*	---	---	---	---	---
ER cluster 2: *"mostly some of everything"*	-0.15	0.14	-0.49	0.17	>.05
No ER cluster: *posterior probability >0.80*	-0.08	0.17	-0.58	0.35	>.05
Covariates					
Child age	0.09	0.05	-0.03	0.23	>.05
Child male	-0.16	0.11	-0.45	0.122	>.05
Income	-0.00	0.00	-2.55	1.23	>.05
EMA compliance	-0.00	0.00	-0.01	0.00	>.05

Bootstrapped linear regression analysis revealed no significant differences in ERSB success by negative ER cluster membership while controlling for child age, gender, income, and EMA compliance.

There was a significant positive association between child age on caregiver perceived success of regulating child emotions, such that caregiver-reported ERSB success increased with child age ($F(6, 660) = 0.09$, 95% CI[0.00 – 0.19], $p < .05$).

Negative ERSB Clusters and ERSB Success: Mean Difference ANOVA

To assess the association between negative ERSB cluster membership and caregiver perceived ERSB success (e.g., success of regulating their child's emotions), I first ran Kruskal-Wallace rank sum non-parametric one-way ANOVAs between ER clusters and caregiver mean reported ERSB success at each measurement occasion. One-way ANOVA results indicated significant mean differences in caregiver reported ERSB success across negative ERSB clusters (χ^2 (3, 659) = 36.99, p < .001). I then ran a Wilcoxon rank-sum test to determine which cluster means differed significantly from one another and corrected for multiple comparisons using the Holm correction. Mean differences between subtests are indicated by superscripts in Table 38.

Negative ERSB cluster 1 ("mostly no regulation"; M = 4.84, SD = 0.14) reported significantly greater mean ERSB success compared to ERSB cluster 2 ("mostly some of everything"; M = 3.78, SD = 0.14). Negative ERSB cluster 1 ("mostly no regulation"; M = 4.84, SD = 0.14) also reported significantly greater mean ERSB success compared to ERSB cluster 3 ("mostly engagement-focused"; M = 4.30, SD = 1.22).

Negative ERSB cluster 3 ("mostly engagement-focused"; M = 4.30, SD = 1.22) reported significantly greater mean ERSB success compared to ERSB cluster 2 ("mostly some of everything"). However, ERSB cluster 3 ("mostly engagement-focused"; M = 4.30, SD = 1.22) reported significantly lower mean ERSB success compared to the no ERSB cluster (M = 4.63, SD = 0.74).

Negative ERSB Clusters and ERSB Success: Linear Regression

Linear regression models to predict caregiver-reported ERSB success from caregiver negative ERSB cluster violated the assumption of normality and were re-run as bootstrapped linear regression models with 1000 re-sampling iterations. Bootstrapped model confidence intervals were interpreted at the .05, .01, .001 levels of significance. Results from these bootstrapped linear regressions are described below and can be found in Table 41.

Table 41.

Bootstrapped Logistic Regressions: Negative ERSB Clusters Predicting ERSB Success

	Bootstrap				
			Confidence Intervals		
	Beta coefficient	SD	Lower	Upper	*p*-value (2-tailed)
ERSB cluster 1: "m*ostly no regulation"*	0.54	0.17	0.19	0.86	.01
ERSB cluster 2: "m*ostly some of everything"*	-0.52	0.19	-0.90	-0.14	.01
ERSB cluster 3: "*mostly engagement focused"*	---	---	---	---	---
No ERSB cluster: *<0.80 cluster membership*	0.32	0.14	0.06	0.60	.05
Covariates					
Child age	0.11	0.05	0.01	0.21	.05
Child male	-0.05	0.11	-0.24	0.17	> .05
SES	-0.00	0.00	-2.20	7.98	> .05
EMA compliance	-0.00	0.00	-0.00	0.00	> .05

Negative ERSB cluster 3 ("mostly engagement-focused") was the reference group for these analyses. ERSB cluster 1 ("mostly no regulation") had a stronger positive association with ERSB success than the "mostly engagement-focused" cluster, OR = 0.54, 95% CI[0.19 – 0.86], $p < .01$. The no ERSB cluster was also positively associated with ERSB success (OR = -0.33, 95% CI[0.06 – 0.60], $p < .01$) as compared to the "mostly engagement-focused" cluster (OR = -0.33, 95% CI[0.06 – 0.60], $p < .01$). However, ERSB cluster 3 ("mostly engagement-focused") had a stronger positive association with ERSB success as compared to ERSB cluster 2 ("mostly some of everything"), $F(7, 659) = -0.52$, 95% CI[-0.90 – -0.14], $p < .01$.

Exploratory Research Question 3

Main Effect of Child Lability on Success of Regulating Negative Emotions

Linear regressions were run between child lability and both ER and ERSB success to determine whether there was a main effect of child lability on ER and ERSB success. Models met assumptions for linearity, homogeneity of variance, influential observations, collinearity, and normality of residuals.

Analyses indicated there was a significant main effects of child lability on negative ERSB success, $F(5, 659) = -0.11$, SD = 0.04, $p = .13$. There was no main effect of child lability on ER success, $F(5, 659) = -0.54$, SD = 0.05, $p = .24$, while controlling for child age, child gender, income, and survey compliance.

Regression Results: Interaction of Child Lability and Negative ER Cluster on ER Success

Linear regression models to predict caregiver reported negative ER success from the interaction between negative ER clusters and child emotional lability met assumptions for linearity, homogeneity of variance, influential observations, collinearity, and normality of residuals. Regressions controlled for child age, child gender, income, and survey compliance. Results (Table 42) did not indicate a significant interaction between negative ER cluster and child lability on ER success as compared to the reference group interaction between "even class split" and child lability on ER success. There were no significant slopes or contrasts upon observation of estimated marginal means.

Table 42.

Linear Regression: Interaction between Negative ER Cluster and Child Lability on ER Success

	Estimate	Standard Deviation	*p*-value
Intercept	5.13	0.39	< .001
ER cluster 2: *"mostly some of everything"*	-0.90	0.21	< .001
No ER cluster: *posterior probability <.80*	-0.27	0.27	< .001
Interaction terms			
ER cluster 2: *"mostly s/of everything"* * lability	0.19	0.12	.11
No ER cluster: *posterior probability < .80* * lability	-0.01	0.18	.94
Covariates			
Child age	0.01	0.05	.79
Child male	-0.20	0.11	.08
Income	-0.00	0.00	.46
EMA compliance	-0.01	0.00	.01
	$R^2 = 0.06$, adjusted $R^2 = 0.05$, Degrees of Freedom = 655		

Regression Results: Interaction of Lability and Negative ERSB Cluster on ERSB Success

Linear regression models to predict caregiver reported ERSB success from the interaction between negative ERSB clusters and child emotional lability did not meet assumptions for linearity, homogeneity of variance, influential observations, collinearity, and normality of residuals, and were bootstrapped and re-run with 1000 iterations. Regressions controlled for child age, child identified gender, income, and survey compliance. Results (Table 43) did not indicate a significant interaction between negative ERSB cluster and child lability on ERSB success, as compared to the reference interaction between "even class split" and child lability on ER success. There were no significant slopes or contrasts upon observation of estimated marginal means.

Table 43.

Interaction between ERSB Cluster and Child Lability Interaction on ER Success

			Bootstrap		
			Confidence Intervals		
	Beta coefficient	SD	Lower	Upper	*p*-value (2-tailed)
ERSB cluster 1: M*ostly no regulation * lability*	0.19	0.16	-0.12	0.48	>.05
ERSB cluster 2: M*ostly s/of everything* lability*	-0.00	0.13	-0.27	0.26	>.05
ERSB cluster 3: *mostly engagement focused* lability*	---	---	---	---	---
No ERSB cluster: > 0.80 cluster membership* *lability*	0.00	0.09	-0.18	0.18	>.05
Covariates					
Child age	0.12	0.05	0.02	0.22	.01
Child male	-0.05	0.11	-0.25	0.16	>.05
SES	-0.00	0.00	-0.00	0.00	>.05
EMA compliance	-0.00	0.00	-0.00	0.00	>.05

Exploratory Results Summary

Negative ER Profiles

At measurement occasions (level 1) with negative caregiver emotions, caregiver ER profiles were nearly identical to the classes of strategies that emerged in the original ER LCA models run with all caregiver emotions, in that they included: 1) a class characterized by mostly no regulation, 2) a class characterized by use of acceptance, labeling, reappraisal, and avoidant distraction (although avoidant distraction was not represented in the original model class), and 3) a class characterized by use of moderate use of nearly all strategies apart from "no regulation." As elaborated prior, these profiles align with three common varieties of regulation profiles documented in previous ecological momentary assessment work (De France & Hollenstein, 2017; Lougheed & Hollenstein, 2012).

At the caregiver level, negative emotion models were characterized by two ER clusters, as opposed to the three clusters which emerged in the models run with all caregiver emotions (all emotion clusters included: all or nothing cluster, mostly some of everything cluster, mostly accept and label cluster). The two ER clusters for regulating negative emotions included: 1) an "even class split" cluster which was characterized by flexibility in class use, such that at measurement occasions over the course of the week, caregivers in this cluster drew equally from using a) no regulation, b) a combination of acceptance, labeling, reappraisal, and / or avoidant distraction, or c) a mix of all regulation strategies; and 2) a cluster predominantly characterized by use of a mix of all strategies across measurement occasions. It is important to highlight a key distinction between these negative ER clusters, which is their diversity in strategy use. Whereas caregivers in the "even split" ER cluster endorsed using several different distinct combinations of strategies across time and situations, caregivers in the "mostly some of everything" cluster, consistently endorsed using a mix of several strategies across measurement occasions.

Negative ERSB classes at the measurement occasion level likewise mirrored the ERSB classes from the original model which included all emotions and included measurement occasions characterized by 1) no regulation of child emotions, 2) a mix of all strategies to regulate child emotions, and 3) a combination of acceptance, labeling, reappraisal, and social sharing to regulate child emotions.

Regarding level 2 negative ERSB clusters, three clusters of caregivers emerged, as opposed to the five caregiver ERSB clusters found in the original models. The three profiles for how caregivers regulated their child's emotions at timepoints when caregivers endorsed a negative emotion for themselves included: 1) mostly use of no regulation of child emotions, 2) mostly use of a mix of several strategies across measurement occasions, and 3) mostly use of engagement-focused emotion regulation strategies (e.g., acceptance, labeling, reappraisal, social sharing).

Negative ER Success

Caregivers in the ER cluster characterized by greater diversity in strategy use across the week ("e.g., even class split") reported greater ER success at regulating their own negative emotions than caregivers in the cluster characterized by consistent use of many strategies. This finding is consistent with previous literature on the benefit of emotion regulation flexibility in effectively meeting the changing contextual demands of one's environment (Aldao, Sheppes, & Gross, 2015). Specifically, this finding demonstrates a specific aspect of ER flexibility known as ER repertoire, or individual differences in the range of ER strategies and strategy combinations used to regulate your own or others' emotions over time. This is a notable finding in that greater ER repertoire has been frequently associated with adaptive coping (Bonnano & Burton, 2013) and decreased symptoms of psychopathology (De France & Hollenstein, 2017; Eftekhari, Zoellner, & Vigil, 2009; Lougheed & Hollenstein, 2012). These findings reinforce a similar pattern of findings from a general adult sample (not specific to parenting) in which ER profiles characterized by greater diversity in strategy use were associated with greater dispositional well-being (Grommisch et al., 2020), and provides preliminary evidence that these findings may extend to the parenting context.

This finding that the caregiver negative emotion profile characterized by greater diversity in strategy combinations was associated with regulation success is different from the pattern of findings from the larger model run with all measurement occasions, in which both negative and positive affect were combined. In that model, the caregivers who predominantly used "no regulation" (57% of time) and sometimes used several strategies (30% of time) were associated with the greatest ER success. This difference underscores caregiver emotion valance as an important contextual variable which alters perceived success of caregiver coping strategies in the caregiving context. This finding may suggest that when feeling negative, caregivers may perceive greater benefit from flexibly and thoughtfully aligning their quantity and combination of regulation strategies to the situation at hand, as opposed to always using a variety of strategies to regulate their negative emotions.

Contrary to the original model and hypotheses, at measurement occasions with only negative caregiver emotions, there were no significant differences between caregiver ER cluster and caregiver reported success of regulating their child's emotions. Given the difference between the larger model and the negative affect model, one explanation for this finding may be the decrease in sample size when positive affect timepoints were eliminated. Although there is evidence to suggest that the sample size of the negative affect model was sufficient given the strong class separation (Lukocienë et al., 2010), 147 participants nevertheless fell below the suggested threshold of 180 participants to ensure power in ML-LCA analyses (Bolger & Laurenceau, 2013). It could be that lack of power thus impacted the model's ability to detect an effect. Furthermore, although there were 701 measurement occasions with negative caregiver emotions, of these timepoints, caregivers only reported negative child emotions for 187 of the measurement occasions. It thus may be that in non-clinical samples with relatively high positive affect, the relevance of caregiver emotion regulation in supporting successful emotion socialization may be less salient than in a sample of caregivers whose children's emotions are more difficult to regulate, and in which child emotions may exacerbate emotion regulation difficulties for the caregiver. To confirm this hypothesis, it will be important for future studies to replicate these findings in a sample with a breadth of negative child emotion timepoints. To this end, future studies might consider exploring the success and caregiver ER and ERSB strategies in samples of children diagnosed with clinical or neurodevelopmental disorders commonly characterized by emotion regulation difficulties (e.g., ADHD, autism spectrum disorder, anxiety, disruptive mood dysregulation disorder), to better inform family-based intervention and treatment planning.

Regarding ERSB success at timepoints with negative caregiver emotions, the "mostly no regulation" ERSB cluster of caregivers reported significantly greater success than the than the "mostly some of everything" and "mostly engagement focused" clusters. One interpretation of this finding may be that when caregivers are experiencing negative emotions, taking time to regulate their personal emotions may lead to greater success of regulating their child's emotions than attempting to engage with their child's emotions from a state of negative arousal. This hypothesis is aligned with previous literature on the impact of parental expressed emotion in the context and parent-child interactions and child emotional and social development and arousal (Dix, 1991). For example, studies have shown that toddlers of caregivers who express more frequent positive emotions exhibit more frequent ER themselves in the form of self-soothing behaviors (Garner 1995; Eisenberg, 2001). Conversely, maternal expression of anger and hostility while caregiving has been associated with decreases in a child's ability to cope with stress (Valiente et al. 2004). It is important to note that more recent studies of parental expressed emotion while caregiving have painted a more nuanced and strengths-based picture of how caregiver emotional expressions impact child development, such that caregivers have been documented to experience a greater intensity and range in emotions when caregiving compared to when they are alone (Kerr et al., 2021), which the authors attributed to emotional responsivity and adaptation to their child's needs (Quoidbach et al., 2014).

CHAPTER IV
DISCUSSION

This study is the first to my knowledge to use multi-level latent class analyses to model caregiver regulation and socialization of preschoolers' emotions in the context of parent-child interactions using Ecological Momentary Assessment (EMA) (Zimmer-Gembeck et al., 2021). As such, it extends prior research on emotion regulation and socialization in the caregiving context by capturing additional nuances and complexities of emotional experiences as they unfold in daily life. The aim of this work was to clarify the ways that caregivers of preschool-aged children regulate their emotions and the emotions of their children in daily life, and how caregiver regulation of their own emotions influences their perceived success of regulating their own and their preschoolers' emotions. I was also interested in exploring if there were differences in the effectiveness of caregiver ER and ERSB regulation profiles based on child temperament, which was measured in this study by mean successive square difference (MSSD) calculations which quantified child lability in emotional experiences. Results revealed distinct profiles characterizing how a non-clinical sample of caregivers regulate both their own (ER) and their child's (ERSB) emotions in daily life, and unique associations between caregiver regulation profiles and regulation success by child emotional lability and caregiver emotion valence.

Overall, this pattern of findings echo the body of previous research which calls for the importance of considering situation and contextual variables when judging the value of emotion regulation strategies (Morris et al., 2018; Morris et al., 2007). In this study, two contexts were found to alter the perceived success of caregiver emotion regulation strategies: the valence of the caregiver's emotion and the child's emotional lability. Regarding caregiver emotion, different regulation profiles were associated with the greatest reported regulation success depending on whether the caregiver was experiencing a positive versus a negative emotion when they were engaging in the regulation process. Specifically, when experiencing a negative emotion, caregivers who reported flexible use of several strategy combinations over time felt most successful at regulating their own emotions, and those who reported “no regulation” for their child’s emotion felt the most successful at managing their child’s emotion.

The second context which altered the perceived effectiveness of caregiver emotion regulation strategies was child emotional lability. Findings suggest that child emotional lability moderated the association between caregiver ERSB cluster and ERSB success. Similar to the most successful ER cluster at negative timepoints, caregiver ERSB repertoires characterized by diversity in strategy combinations over time and situations were perceived as more successful for responding to children with higher levels of emotional lability. This finding adds to the growing body of literature which situates child temperament as an important moderator of parenting behaviors and child socialization, a gap identified by Morris et al., (2007) (Zubizarreta et al., 2019; Sour et al., 2019; Hentges et al., 2022).

Furthermore, these findings altogether underscore the importance of emotion flexibility as a beneficial skill for caregivers in regulating their own emotions and for regulation of their child’s emotions, especially in the context of negatively valanced caregiver emotions and labile child emotions. Regulation profiles characterized by a diversity in strategy combinations throughout the week were perceived by caregivers as being the most successful for regulating their own negative emotional experiences, and for regulating the emotions of children with greater emotional lability. This finding reinforces and extend existing knowledge in three main ways. First, this pattern is consistent with studies documenting the role of emotion regulation flexibility as a protective factor against mental health problems (Grommisch et al., 2021), and provides evidence that these associations may extend to the parenting context. Second, these findings align with literature suggesting that the functional benefit of specific emotion regulation strategies vary by individual and situation, and as such, efficacy is likely to increase with flexibility (Aldao et al., 2015). Lastly, these findings offer additional nuance to a previous body of work on parent emotion regulation which documents associations between high maternal ER and cognitive control and positive parenting practices (see Crandall et al., 2015 for a review). The present findings suggest that while high regulation and cognitive control is associated with regulation success in some context (e.g., positive caregiver emotions and for caregivers of children with little fluctuation in emotional valence and intensity), in others, applying flexible decision making and choosing to abstain from regulation may be the most adaptive and successful choice for a caregiver.

Contrary to previous work and my hypotheses, the present study did not find that caregiver regulation clusters characterized by primarily engagement-focused strategy use were the most successful for navigating daily life with their preschool-aged child in this sample of caregivers. Rather, in the original models which included all caregiver emotions, caregivers in ER and ERSB clusters characterized predominantly use of “no regulation” (and for ER, mostly using “no regulation” interspersed with “mostly some of everything”) reported the greatest success at managing their own and their child’s emotions. Caregivers in the socialization cluster predominantly characterized by use of “no regulation” likewise reported the greatest success at regulating their child’s emotions.

There are a couple primary interpretations of these findings. First, as mentioned previously, is the fact that in the present non-clinical sample, many of the caregiver and child emotions represented at measurement occasions likely did not require use of engagement-focused coping strategies to meet the caregiver's emotion management goals. It is thus important to consider what our measure "regulation success" represents at measurement occasions in which caregivers report that they did not regulate their emotions. Across measurement occasions, it is likely that caregivers in clusters marked by a high frequency of "no regulation" were already experiencing high levels of success at managing their own and their child's emotions, did not feel a need to regulate to meet emotion their goals for themselves and their child, and thus continued to feel successful in their emotion management despite choosing not to regulate. In other words, it is likely that these caregivers were first successful and therefore did not regulate, as opposed to being successful *as a result* of their choosing to not regulate. This idea was supported by the finding that caregivers of children at higher levels of emotional lability in these same "no regulation" clusters reported less success than caregivers in the "no regulation cluster" with less labile emotions, despite it being the most successful cluster overall. Thus, in this sample, the perceived efficacy of not regulating was dependent on the caregiving context (e.g., the emotional lability of the child) at hand.

Implications for Practice

Findings from this study offer insight into factors impacting regulating and socialization in the caregiving context, which can be used to inform clinical practice. Present evidence for the benefit of caregiver flexibility and discrimination of ER and ERSB use by situation and context points to *psychological flexibility* as a valuable target for supporting caregivers in coping with difficult emotions in themselves and their children (Flujas-Contreras et al., 2022). Psychological flexibility is defined as the ability to be aware of thoughts and feelings in the moment, and to take effective action guided by values in the presence of discomfort (Hayes et al., 2016). This concept in a core tenet of Acceptance and Commitment Therapy (ACT). Importantly, caregiver psychological flexibility has been shown to mediate he relationship between stress and parenting behaviors (Fonseca et al., 2020), and has likewise been linked to adaptive child emotion regulation and attachment (Moreira et al., 2020; Williams et al., 2012). Given this research base and the present findings, it may be that integrating ACT or other approaches for cultivating flexibility into parent management training and family therapy sessions could be particularly useful for caregivers who experience difficulty with managing negative emotions in themselves, or labile emotions in their preschool-aged children.

Existing studies have begun to explore this combination in relation to parent management training for difficult child behaviors. For example, a single-case study following the treatment response of a mother of an 11-year-old male child with a diagnosis of Oppositional Defiant Disorder found improved emotion regulation, flexibility in parenting behaviors, and decreased parental stress after receiving ACT therapy (Flujas-Contreras, 2020). Additionally, the application of ACT in the context of caregivers of children with autism spectrum disorder, chronic pain, medical complexities, and anxiety has demonstrated positive impacts on parent emotions and mental health across several previous studies (see Byrne et al., 2020 for a review), including samples of preschool caregivers (Corti et al., 2018). Given this literature and the present findings, incorporating skills for psychological and regulation flexibility within parent skills training could thus support parents in not only developing an emotion regulation skill toolbox, but also attuning to features of the situation and their values for emotion and parenting in the context of regulation.

Limitations and Future Directions

These findings must be interpreted in the context of several important limitations. First is that, while this study measured caregiver perception of regulation success following their use of

ER and ERSB strategies, due to the remote and uni-modal nature of the study, we were not able to compare caregiver perceived success to measurable caregiver and child regulation outcomes otherwise indicative of regulatory success (e.g., behavioral de-escalation, vagal tones, etc.) using standardized methods. This study thus did not capture differences in how individual caregivers conceptualized a "successful" regulation attempt. This consideration is important, as definitions of success may depend on a variety of factors, including a caregiver's emotion management goals (in general and across situations), emotion beliefs, cultural expectations around emotion displays, and other variables which contribute to the subjective nature of success (McRae et al., 2020). As originally stated by one the first and most prominent emotion socialization researchers, "the degree to which a given ERSBs promotes desirable outcomes depends on the definition of desirable" (Eisenberg et al., 1998, p. 3).

These limitations can be addressed by future EMA research on dyadic emotion regulation processes in a few ways. First, research on caregiving behaviors and outcomes should strive to include and / or compare multiple modes of assessment (e.g., global reports, daily reports, physiological measures), and rater perspectives of outcome variables (e.g., self-report, assessor observation) to provide a more detailed understanding of what comprises efficacious regulation and behavior in the caregiving context. Additionally, in these lines of research, cultural variables which impact caregiver beliefs around emotion displays and experiences are important to moderators of the relationships between ER and success, as well as ERSBs and success (e.g., Lansford et al., 2018). Relatedly, future research considering caregiver perception of ER and ERSB success may consider factoring caregiver's regulation goals into their interpretations of success across contexts (see Eldesouky & Gross, 2019 for an overview of ER goals).

Along similar lines, a second limitation was lack of cultural and racial diversity represented in this sample, which limits generalizability of the findings to non-White cohorts of caregivers who do not identify as female mothers. While the data collection team strived to recruit a racially and ethnically representative sample, we still ended up with a relatively homogeneous sample. Thus, it is important for future research to work even harder to represent diverse voices and caregiving experiences in parenting and socialization research (Dunbar et al., 2017; Umaña-Taylor & Hill, 2020). Given the large number of covariates included in this study with proximal associations to parenting behaviors (e.g., child gender, income, child age), and small sample sizes of non-White caregivers and children, race and ethnicity were not included as a covariate to maintain model parsimony, and to adhere to scope and aims of this present study. However, this is an important direction to explore in future analyses with these data.

Another limitation of the current study design is that it did not allow for differentiation between simultaneous and sequential ER and ERSB use, or the goodness-of-fit between regulation strategy and situation. Because caregivers were instructed to endorse all regulation strategies they had used to regulate their own emotion since the previous survey, followed by all regulation strategies used to regulate their child's emotions, it is possible that the ER and ERBs did not occur during the same parent-child interaction. This thus may have impaired the conclusions that could be drawn from how caregiver ER impacts ERSB success in the moment, and possibly contributed to the lack of significant main effect between ER and ERSB success in the negative affect models. Regarding goodness-of-fit, while I interpreted high diversity ER and ERSB profiles as representing caregiver flexibility in matching regulation strategy combinations to contexts, I did not have data to differentiate between caregivers in these clusters who were strategically aligning their regulation choices to the environment, compared to those who were applying a diversity of combinations with less consideration for features of the situation.

To account for these considerations, it is advisable that future ecological momentary assessment studies interested in exploring the impact of caregiver ER on parenting behaviors instruct participants to consider elapsed time between the emotion their child was experiencing their own peak emotion. For goodness-of-fit, future research may consider incorporating analyses of caregiver cognitive and decision-making processes when making ER and ERSB choices.

As elaborated in greater detail above, a third limitation was the relatively small number of timepoints in this sample in which caregivers reported a negative emotion for themselves and for their child compared to timepoints with positive affect, which may have impacted detection of associations in these analyses in the negative affect model, and with my child lability moderations. A way to ensure increased emotional variability in future studies could be to screen participants for child behavior, emotion regulation, and prior diagnoses to determine eligibility to participate.

Conclusion

Caregiving places unique demands on parent emotions compared to other interpersonal contexts (Rasmussen et al., 2017). By applying Latent Class Analysis methods to EMA data, the present study extends existing knowledge by demonstrating individual differences in caregiver profiles of momentary ER and ERSB strategies vary across contexts in daily life and are related to perceived success in emotion management. There is much yet to be learned about daily regulation and socialization in other samples of preschool caregivers. Nevertheless, by investigating the individual differences represented in this sample, the current findings suggest that when it comes to caregiver ER and ERSBs, one-size may not fit all. Rather, results suggest that for caregiver's of preschoolers with labile emotions, a focus on developing a flexible ER and ERSB skill repeoiroire which includes a mix of engagement and disengagement strategies may most successful for managing their own and their child's emotions, and most efficacious in supporting their child's development of adaptive regulation skills.

APPENDICES

APPENDIX A: DAILY CHECK-IN SURVEY ITEMS

1. "How difficult has your child's behavior been to manage in the last 4 hours?"
   a. **Scoring**
      i. 1-6 Likert Scale: 1 – Not at all difficult, 6 – Extremely difficult
2. "Choose the strongest emotions you felt in the past 4 hours:"
   a. **Scoring**
      i. Choose one emotion:
         1. Joyful
         2. Angry
         3. Accomplished
         4. Irritable
         5. Grateful
         6. Worried
         7. Content
         8. Stressed
         9. Strong
         10. Sad
         11. Proud
         12. Lonely
         13. Interested
         14. Hopeless
         15. Excited
         16. Guilty
         17. Attentive
         18. Frustrated
         19. Empty
3. "For the emotion you felt most strongly in the past 4 hours, how would you describe this emotional experience?"
   a. **Scoring**
      i. 1-6 Likert scale: 1 – Very negative, 6 – Very positive
4. "How did you respond to this emotion in the moment?
   a. **Scoring**
      i. Choose all that apply:
         1. I did not want to change the emotion
         2. I took a step back and changed the way I was thinking about the situation
         3. I hid my emotion from others
         4. I physically changed the situation (e.g., changed locations)
         5. I attended to other responsibilities (e.g., doing the dishes, laundry)
         6. I tried to do something pleasant (e.g., watched favorite show, take a bubble bath)
         7. I accepted the emotion
         8. I ignored the emotion
         9. I labeled the emotion (e.g., I am feeling discouraged)
         10. I shared the emotion with others

            11. I thought about the emotion over and over
5. “How successful do you think this response was?”
    a. **Scoring**
        i. 1-6 Likert scale: 1 – Very unsuccessful, 6 – Very successful
6. “Were you with your child since the previous survey?”
    a. **Scoring**
        i. Mark one:
            1. Yes
            2. No
7. “Choose the strongest emotion your child felt in the past 4 hours:”
    a. **Scoring**
        i. Choose one emotion:
            1. Joyful
            2. Angry
            3. Accomplished
            4. Irritable
            5. Grateful
            6. Worried
            7. Content
            8. Stressed
            9. Strong
            10. Sad
            11. Proud
            12. Lonely
            13. Interested
            14. Hopeless
            15. Excited
            16. Guilty
            17. Attentive
            18. Frustrated
            19. Empty
8. “For the emotion your child felt most strongly in the past 4 hours, how would you describe this emotional experience?”
    a. **Scoring**
        i. 1-6 Likert scale: 1 – Very negative, 6 – Very positive
9. “How did you respond to your child’s emotion in the moment?
    a. **Scoring**
        i. Choose all that apply:
            1. I did not try to change their emotion
            2. Offered them other ways to interpret the situation (e.g., explained reasoning, etc.)
            3. I verbally encouraged them to change their emotions (e.g., “don’t cry”)
            4. I physically changed the situation (e.g., hid broken toy so they couldn’t see it, removed child from environment)
            5. I encouraged them to do something pleasant (e.g., watch cartoons)
            6. I expressed that is was OK to feel their emotion
            7. I ignored their behavior or feelings

8. I verbally provided a label for the emotion (e.g., "you're feeling sad")
9. I encouraged them to share how they were feeling (e.g., "tell me more")

10. "How successful was your response to their emotion."
    a. **Scoring**

1-6 Likert scale: 1 – Very unsuccessful, 6 – Very successful

APPENDIX B: ER AND ERSB CLUSTER TABLES

Table B1.

ER Class and Class Descriptions: All Timepoints

Measurement occasion classes	
ER Class 1	Primarily use of: Acceptance, labeling, and no regulation
ER Class 2	Use of all ER strategies, never no regulation
ER Class 3	Primarily use of no regulation
Caregiver level clusters	
ER cluster 1: "all or nothing"	Mostly class 3: no regulation and all ER strategies
ER cluster 2 "mostly some of everything"	Mostly class 2: Use of all ER strategies
ER cluster 3 " accept and label"	Mostly class 1: acceptance, labeling, and no regulation

Table B2.

ERSB Class and Class Descriptions: All Timepoints

Measurement occasion classes	
ERSB Class 1	Use of all ERSB strategies, with respectively more frequent avoidant distraction and positive distraction
ERSB Class 2	Primarily use of No Regulation
ERSB Class 3	Primarily use of acceptance, labeling, reappraisal, and social share
Caregiver level clusters	
ERSB cluster 1: "mostly some of everything"	Primarily Class 1: use of all ERSB strategies
ERSB cluster 2: "mostly engagement-focused strategies"	Primarily use of class 3: acceptance, labeling, reappraisal, and social share
ERSB cluster 3: "mostly No Regulation"	Primarily use of class 2: No regulation
ERSB cluster 4: eEven class split"	Equal use of all three ERSB classes across measurement occasions
ERSB cluster 5: "all or nothing"	Split of classes 1 and 2: all strategies or no strategies

Table B3.

ERSB Class and Class Descriptions: Caregiver Negative Affect Timepoints

Measurement occasion classes	
Negative emotion ER Class 1	No regulation
Negative emotion ER Class 2	Acceptance, Labeling, Avoidant Distraction
Negative emotion ER Class 3	Mix of all strategies, no use of acceptance or "no regulation"
Caregiver level clusters	
Negative emotion ER cluster 1: "even class split"	Even split of ER class 1, 2, and 3
Negative emotion ER cluster 2 "mostly some of everything"	Mostly class 3: some of everything

Table B3.

ERSB Class and Class Descriptions: Caregiver Negative Affect Timepoints

Measurement occasion classes	
Negative emotion ERSB Class 1	No regulation class
Negative emotion ERSB Class 2	Mostly acceptance, labeling, reappraisal, social sharing
Negative emotion ERSB Class 3	Mostly bit of everything
Negative emotion ERSB cluster 1: "mostly no regulation"	Mostly class 1: no regulation
Negative emotion ERSB cluster 2: "mostly some of everything"	Mostly class 2: some of everything
*Negative emotion ERSB cluster 3: "m*ostly engagement-focused*"*	Mostly class 3: engagement focused

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