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Parent Facilitation of Child Emotion Regulation in Autism Spectrum Disorder

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PARENT FACILITATION OF CHILD EMOTION REGULATION IN AUTISM SPECTRUM DISORDER

by

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DEDICATION

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ABSTRACT

Parents play a substantial role in their children's emotional regulation (ER) abilities, promoting both adaptive and maladaptive development. Children with autism spectrum disorder (ASD) often have difficulties regulating their emotions, manifesting in externalizing behavioral issues (Mazefsky & White 2014). Though there are many similarities to parents of typically developing (TD) children, parents of children with ASD facilitate their children's ER development (i.e., emotion socialization) in response to unique challenges, often developing resiliency but other times contributing to their children's dysregulation and behavioral challenges. Using Morris et al.'s (2007) Tripartite Model of Family Impact of Children's Emotion Regulation and Adjustment as a framework, this study adds to the available knowledgebase of parent facilitation of child ER development in ASD. Using a momentary sampling procedure, the current study investigated how parents of children with ASD facilitate child ER through 1.) observation and modeling from parents, 2.) specific parent emotion socialization behaviors, and 3.) the emotional climate of the home and parenting style. After identifying the relative frequencies with which parents use particular ER strategies during challenging child behavior, multilevel models explored the relative influences of the domains of the Tripartite Model on the association between momentary parent stress and behavioral intensity. Finally, the study examined the influence of previous ratings of stress on child behavioral intensity to better understand the cumulative effect of daily parent stress on

child behavior. This study is among the first to comprehensively consider parents' emotion facilitation in the context of child behavioral problems, specifically when the child has a diagnosis of ASD. Implications for further supporting children's emotional development and recommendations for parent involvement are discussed.

Keywords: autism, parents, emotion regulation, emotion socialization

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LIST OF SYMBOLS

β.....Beta

γ.....Gamma

LIST OF ABBREVIATIONS

ASD.....Autism Spectrum Disorder

EMA.....Ecological Momentary Assessment

ER.....Emotion Regulation

ICC.....Interclass Correlation Coefficient

M.....Mean

SD.....Standard Deviation

CHAPTER 1
INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder affecting 1 in 36 individuals in the country (Maenner et al., 2023). In addition to social and communication difficulties, repetitive motor behaviors, and unusual sensory- and/or focused- oriented interests, over half of all children with ASD exhibit internalizing and externalizing behavior problems (Mazefsky & White, 2014). Behavior problems are often a manifestation of emotion dysregulation, which is heightened in children with ASD (Weiss et al., 2014). Parenting stress, which is more pronounced in parents of children with ASD than those of any other developmental disability, has long been associated with child externalizing behavior problems (Hayes & Watson, 2013). This relationship can be understood within the context of emotion regulation (ER) processes in both parent and child, particularly with respect to how parents implicitly and explicitly facilitate child ER.

Emotion Regulation

The ability to regulate one's emotions is an important process at all levels of development and is necessary for behavioral and social competence (Eisenberg et al., 2000; Raver, 2004). ER is defined as the process by which individuals monitor their own affectual state and arousal level and manage their expressions of these states through both automatic and controlled mechanisms (Gross, 1998; Gross, 2013). Regulating one's emotion involves modulating "when" one has an emotion and "how" the emotion is

experienced or expressed, which can include the goal of either up- or down- regulating both positive and negative emotions and subsequent emotional expression (Gross, 1998; Gross, 2013). Per Gross' (2013) Process Model of Emotion Regulation, ER may involve situation modification, attentional deployment, cognitive change, and response modulation. Intrinsic methods of ER include within-person self-regulation strategies (e.g., suppressing a laugh at an inopportune time), whereas extrinsic sources of support include a person assisting with regulation (e.g., social support, a parent providing reassurance and soothing, etc.). Importantly, intrinsic and extrinsic regulation can co-occur, such as when one helps coregulate another's emotions and effectively soothes themselves (e.g., a parent provides reassurance and soothing to a crying toddler, etc.).

Individuals with ASD often have difficulties with emotion awareness and emotion processing, which impedes successful ER and associated social norms. Further, some researchers argue that people with ASD use "adaptive" strategies less frequently and "maladaptive" strategies more often than neurotypical individuals (Weiss et al., 2017). Children with ASD also tend to use simpler, less developed strategies for ER than do typically developing (TD) children (Cibralic et al., 2019), and they may be more reliant on regulatory, extrinsic support from parents and caregivers. In one study, for example, children with ASD resigned from a frustrating and difficult task more often than TD children when their parent was not available to assist them, (Jahromi et al, 2012), emphasizing the need for ER assistance in children with ASD.

Several factors contribute to child ER in ASD. Successful ER is related to less ASD symptom severity, higher IQ, greater language ability, increased executive functioning, less physiological reactivity, and fewer externalizing/internalizing problems

(Cibralic et al., 2019). ER challenges are exacerbated by difficulties reading social and emotional cues, deficits in theory of mind and perspective taking, struggles with generating flexible solutions, tendencies to perseverate, and difficulties with down-regulating emotions (Mazefsky & White, 2014). Moreover, Wood and Gadow (2010) presented a model for a reciprocal relation between ASD and anxiety/negative emotions. They argued that ASD-related stressors (e.g., social confusion, peer rejections, prevention or punishment of preferred behaviors or interests, and frequent aversive sensory experiences, etc.) lead to more negative affect, which contributes to more ASD symptoms, conduct problems, personal distress, and mental health problems. Thus, impaired social development and negative emotions promulgate a cycle of ER dysfunction and behavioral problems in individuals with ASD.

Emotion Facilitation

Children learn ER skills from their caregivers and others through a process of emotion socialization. Eisenberg, Cumberland, and Spinrad's (1998) seminal review defined emotion socialization as the facilitation of children's understanding, experience, expression, and regulation of emotions; furthermore, the authors concluded that the literature supported bidirectional effects of parent socialization and child emotional and social competence. Accordingly, socialization of ER includes both top-down and bottom-up processes as a child learns to understand and utilize emotion-control strategies (Thompson, 2013). Morris et al.'s (2007) review proposed the Tripartite Model of Family Impact on Child ER and Adjustment (as shown in Figure A.1 in the Appendix). The authors proposed that 1.) children learn ER from observation and modeling of caregiver ER, 2.) parents use specific practices and behaviors to guide children through ER, and 3.)

the parenting style and emotional climate of the family impacts child ER. These family contextual factors, among others (e.g., parent beliefs about ER), serve as extrinsic factors of ER, which either facilitate successful emotional regulation or hinder emotional self-control in children (Thompson, 2013). To promote neurodiversity-affirming language, this paper refers to 'emotion socialization' as 'parent facilitation of child ER'.

Parent ER facilitation processes vary greatly across developmental stages, as children go from relying on others to meet their emotional needs to learning to regulate themselves independently. In infancy, caregivers manage their child's emotions directly by soothing distress, pacifying fear, and eliciting positive emotions (Calkins & Hill, 2007; Thompson, 2013). Young children learn to expect that emotional distress is manageable and that adults can help assuage emotionally challenging situations. The preschool age represents a period when emotion awareness begins to emerge, and children start to understand the connection between emotional experience and their own behavior to regulate it (Cole, 2009). As children shift to self-regulation, their parents systematically guide them through becoming aware of their emotions and co-regulate with them through distraction, reappraisal, soothing, and response modulation, until support is no longer needed (Silkenbeumer et al., 2016). Elementary school-age children largely regulate their emotions on their own, and ER becomes more stylized and part of one's personality (Cole et al., 1994). Little is known about coregulation mechanisms between caregivers and adolescents. However, a review of the literature demonstrated that parent ER (e.g., negative affect, conflict resolution, and parent emotion management) is linked to adolescent ER (Yap et al., 2007), and these findings were recently replicated

in a sample of caregivers and adolescents with neurodevelopmental disorders (Breaux et al., 2022).

Observation

Since it was first proposed in 2007, evidence for the Tripartite Model has continued to emerge. The first tenet, observation of parent ER, has its roots in social learning theory (Bandura, 1977), which is relevant for situating caregiver regulatory behavior as an extrinsic factor of child ER. Children look to their parents' emotional displays and interactions to learn how they should respond in emotion-evoking situations (Eisenberg et al., 1998). Parents' own ER ability affects their responses to their children's emotions, and lack of adaptive parent ER can contribute to a "transactional cycle of parent dysregulation, invalidation, and youth dysregulation" (Buckholdt et al. 2014, p. 326). Such a transactional approach has also been applied to associations between parent stress, negative parental reactions to child emotions, and child externalizing behaviors (Mackler et al., 2015). Moreover, parents who have more difficulties with emotion regulation are likely to exhibit more unsupportive and invalidating responses to their children's emotions (Buckholdt et al. 2014), in part due to their own heightened emotional experience and feelings of overwhelm (Maliken & Katz, 2013).

Parents' individual coping skills and ER ability are variable, and there are unique implications within families with children with ASD. There is some evidence that parents of children with ASD tend to use more maladaptive coping skills (i.e., more avoidance strategies and less social-support-seeking strategies) in response to stress than do parents of TD children (Vernhet et al., 2018). However, when parents use more cognitive reappraisal (e.g., reframing one's perception of a situation) as an ER strategy, they are

likely to report increased wellbeing, regardless of ASD symptomatology (Costa et al., 2017). Furthermore, Lyons et al. (2010) found that among parents who have children with high ASD symptomatology, those who use problem-focused coping strategies (e.g., distraction coping, engaging in pleasurable activities, etc.) were more likely to report lower levels of family stress related to their child. By contrast, emotion-oriented coping (e.g., rumination) was associated with increased pessimism about raising their child. Thus, parents who adapt to stress using more successful emotion regulation and coping strategies fare better in terms of their own emotional wellbeing, but it is unclear what strategies parents select during challenging child behavior.

Features of the broader autism phenotype (BAP) may also influence ER facilitation. Parents of children with ASD often present with BAP, which is a sub-clinical phenotype of ASD (Piven et al., 1997; Sasson et al., 2013). Characteristics of BAP include greater aloofness, fewer friendships, more pragmatic language impairments, and more anxiety and sensitivity to criticism than other parents (Losh et al., 2009). Some have suggested that BAP leads to a distinct parenting style as children are exposed to parents with similar ER deficits and less parental responsiveness (Crowell et al., 2019). Recent research has found that parent BAP is associated with greater child negative emotion and lower child inhibitory control (DeLucia et al., 2022). To that end, the interplay between genetic contribution and parent behaviors which facilitates social-emotional development in children with ASD is not well understood.

Parenting Practices

In line with the second tenet of the Tripartite Model, specific parenting practices that influence child ER include both supportive (e.g., emotion-focused, problem-focused,

etc.) and unsupportive (e.g., minimization, invalidating, distressed) responses to child emotion (Cole et al., 2009). In TD populations, *supportive* parental reactions to child emotion (e.g., emotion-focused and problem-focused) are related to more positive psychological outcomes and appropriate ER in the child (Cole et al., 2009; Davidov & Grusec, 2006; Raver 2004). For example, parents who provide more emotion-coaching promote more ER strategy recognition and fewer emotionally driven externalizing behaviors (Cole et al., 2009; Wilson et al. 2013). On the other hand, *unsupportive* parenting responses to child emotion, which can include dismissing and invalidating child emotions, negatively impact the child's ER development and is associated with emotion dysregulation, depression, and poor coping skills in children (Gottman et al., 1997; Sanders et al., 2015; Shaffer et al., 2012). *Distressed* parenting responses include a pattern of increased arousal and avoidance of the child based on parental discomfort with the child's emotion (Fabes et al., 2002). Parents' unsupportive and distressed reactions to children's emotional expression are associated with lower child socioemotional competence compared with supportive responses (Jones et al., 2002; Hurrell et al., 2015). Thus, child ER development is supported by emotion-coaching and guidance, and it is hampered by punitive, invalidating, and distressed reactions.

The effects of parent responsiveness style on outcomes for children with ASD have been briefly examined. For example, Bougher-Muckian et al. (2016) examined the effects of these parenting practices on children with and without ASD. In this study, ASD parents reported 1) significantly less distress in response to child anger, 2) more supportive reactions to anger and fear, and 3) less unsupportive reactions compared to parents of TD children. The authors suggested that parents may feel less distressed when

they apply external attributions (e.g., diagnosis of the ASD) to explain the child's negative emotions. Moffitt et al. (2021) further examined these processes and the effects on sympathetic and parasympathetic nervous systems in children with ASD. Their findings suggested that increased supportive parenting was related to higher child baseline respiratory sinus arrhythmia (RSA), a biomarker of regulatory capacity, and less unsupportive parenting was related to higher electrodermal reactivity (EDA-R), an indicator of inhibitory control. Taken together, the literature suggests a degree of resiliency, as parents of children with ASD can develop parenting practices that are more supportive of their children's displays of emotions, and in turn, positively affect child physiological reactivity and regulation.

Parents directly facilitate child emotional development through a process of *coregulation* to support and model emotional expression for their children (Silkenbeumer et al., 2016). Coregulatory practices are similar yet unique for children with ASD compared to TD children. Notably, children with ASD were found to seek out emotional support from parents as much as TD children (Hirshler-Guttenburg, Feldman, et al., 2015). While there were seemingly no differences in negative parent emotionality or child temperament between families with TD children versus those with ASD, children with ASD did exhibit greater emotional reactivity to frustrating or fearful situations. Moreover, parents of children with ASD used simpler strategies to help their children co-regulate than did parents of TD children. For example, parents of preschoolers with ASD were more likely to use coregulation strategies such as physical soothing, verbal comfort, divertive talk, or attention refocusing, similar to strategies used by parents of TD infants and toddlers (Hirshler-Guttenburg, Golan, et al., 2015). By contrast, parents of TD

children used more cognitive-based tactics, such as emotional reflection and cognitive appraisal.

Parents of children with ASD have a unique approach to coregulation that helps their child develop emotional competence (Gulsrud et al., 2010). In a sample of mothers and their toddlers with ASD, Gulsrud et al. (2010) found that an important coregulation skill was for the parent to take the child's attention away from a distressing event and redirect them to a play activity. In addition, mothers of children with ASD used more active co-regulation strategies (i.e., redirection, prompting, and physical behaviors) and verbal strategies (i.e., vocal soothing and reassurance) when their children were in distress, whereas mothers of TD toddlers used more passive strategies (e.g., verbal explanations). Ting & Weiss (2017) extended these findings in school-aged children of ASD, and they found that parents use more active (i.e., prompting the child through the emotional experience) and passive strategies (i.e., emotion following, or allowing the child to lead the emotional discussion), compared with vocal strategies (i.e., providing reassurance and soothing phrases). Although the preferred processes seem at odds, these findings may suggest that a delicate balance is necessary for co-regulation in school children with ASD. Furthermore, it appears that parents gradually decrease verbal reassurance as the child ages, similar to parents of TD children albeit at a delayed pace. The differences in coregulation strategies between groups suggest that parents of children with ASD possess sensitivity to their children's developmental needs, but it is not clear how these strategies affect child emotion regulation or behavioral functioning.

In ASD, parenting coregulation behaviors may be specific to the child emotion experienced (Hirshler-Guttenbrug, Feldman, et al., 2015) or the agent of coregulation

(i.e., mother or father; Hirshler-Guttenburg, Golan, et al., 2015). For example, Hirschler-Guttenburg, Feldman, et al. (2015) found that anger and fear elicit different coregulation patterns. Mothers of preschool children with ASD were more likely to engage in coregulation strategies during anger-evoking situations but were less involved during fear-evoking situations. This discrepancy potentially exists because externalizing behaviors (e.g., aggression, tantrums, etc.) that occur during frustrating situations are more socially and emotionally challenging for parents, compared to internalizing behaviors that occur during moments of fear (e.g., withdrawal). In a subsequent analysis, the authors found that children's self-regulation is also specific to the stressful context (i.e., fear versus frustration) and is tempered by maternal, but not always paternal, presence (Hirshler-Guttenburg, Golan, et al., 2015). Moreover, mothers and fathers of children with ASD used more simple, direct, and physical de-escalation strategies to downregulate their children's anger and fear, compared with parents of TD children.

Emotion coregulation processes are reciprocal in nature, such that parents and children mutually affect one another's emotions (Valentovich et al., 2018). In a recent study, more emotional flexibility and initiation of positive emotion were noted in ASD parent-child dyads compared with TD dyads (Guo et al., 2017); however, these findings were partially explained by ASD dyads spending shorter time in positive emotion states. Moreover, dyadic flexibility moderated the effect of mutual-positive engagement states on behavioral functioning for children with ASD (Valentovich et al., 2018). In TD children, however, dyadic flexibility and mutual-negative engagement moderated this relationship. The above studies highlight differences in emotion valence and coregulation processes between parents and children with ASD versus TD children. In ASD

specifically, parent-child dyads can leverage mutually positive interactions to increase behavioral functioning, and this is further enhanced by the fluctuation between emotional states.

Child and parent characteristics also impact parents' coregulation practices. For example, increased parent stress related to child rearing is associated with decreased use of vocal strategies (Gulsurd et al., 2010). In their 2010 study, Gulsrud et al. found that greater child externalizing behaviors were associated with increased parent stress, which was related to increased use of active regulatory strategies for coregulation and fewer vocal regulatory strategies. Thus, mothers may tailor their coregulation strategies based on their own stress or on the intensity of child behavioral challenges. Additionally, Laurent and Gorman (2018) found that child social communication abilities influenced parent coregulation behaviors that were associated with development of the child's emotional self-regulation. Parents were more likely to use physical behavior and redirection for children with lower levels of communicative ability, and they used more language engagement and helping with children that had higher levels of communicative ability. The authors found no influence of sensory sensitivities on coregulation strategies. It appears then, that coregulation strategies may become more physical and direct when parents feel more stressed or perceive their child is less capable of understanding them. One may argue that physical guidance and excessive prompting, while necessary in early childhood, may impede ER development in children with ASD, yet a more systematic approach to coregulation may enhance independent self-regulation.

Scaffolding involves hierarchically structuring motivation and emotional support as needed to assist with child ER (Ting & Weiss, 2017). Scaffolding can be motivational,

as parents initiate and sustain the child's enthusiasm (e.g., through praise, redirection, etc.) or emotionally supportive, as they try to make the task a positive experience for the child (Hoffman et al., 2006). Parents guide their children through emotional experiences and foster internalization of adaptive ER skills (Cole et al., 2009). In children with ASD, increased parent scaffolding is related to fewer child externalizing problems (Ting & Weiss, 2017), less emotion dysregulation (Fenning & Baker, 2018), and more optimal physiological reactivity and regulation (i.e., higher RSA and EDA-R, respectively; Moffit et al., 2021). In one study, parent scaffolding led to more child self-regulatory behaviors and child co-regulatory behaviors in preschoolers with ASD, but less scaffolding led to more self-regulatory behaviors and had no effect on co-regulatory behaviors (Hirshler-Guttenburg, Feldman, et al., 2015). Thus, in the absence of parent scaffolding, children were less likely to rely on a caregiver for emotional support during fear- and anger-evoking situations. Taken together, these findings demonstrate that parents who facilitate scaffolding situations promote behavioral and emotional functioning in their children with ASD; in the absence of scaffolding, however, the child may not receive as much emotional support as they need. This is problematic, as many children with ASD are often unable to appropriately regulate their emotions on their own and need extrinsic support. Nevertheless, there is some evidence that child age moderates the inverse relationship between parent scaffolding and child dysregulation, suggesting that children internalize ER strategies over time and may require less support as they get older (Fenning, et al., 2019).

Emotional Climate of the Family

The last tenet of the tripartite model, the emotional climate of the family, is shaped in part by expressed emotion. The emotional climate of the family typically encompasses the relational quality between members as well as the amount of positive or negative emotion expressed in the home (Darling & Steinberg, 1993). The frequency and valence of emotions generate a general pattern of emotional expressiveness (Halberadst et al., 1999). Children living in households marked by coercive and unpredictable displays of emotion are likely to observe a high frequency of emotion dysregulation in their parents (Cummings & Davies, 2022; Hastings et al., 2006). Expressed emotion is the shared affect between two individuals, and high parent expressed emotion is usually characterized by high criticism, low warmth, and significant emotional overinvolvement (Hastings et al., 2006; Morris et al., 2007). High expressed emotion exhibited by caregivers undermines successful self-regulation development in children, and it is associated with negative child outcomes such as greater emotional reactivity, behavioral issues, and psychopathology (Hastings, 2006; Thompson, 2013). When children's emotional behavior is criticized, they are afforded less opportunity to learn adaptive skills for coping with emotional experiences, resulting in greater behavioral dysregulation.

In parents of children with ASD, expressed emotion is associated with greater behavior problems, and these findings have been demonstrated both cross-sectionally and longitudinally (Bader et al., 2015; Bader & Barry, 2014). Interestingly, some evidence has suggested that the relationship does not have a bidirectional association over time; moreover, parents' emotional expression that was characterized by displays of anger and disapproval predicted child externalizing behavior problems 2 years later, but the same

was not true of the reverse. Thus, it appears that parents set the emotional tone of the household to a greater degree than their children. In fact, mounting evidence suggests that parents' emotional reactions toward the child can escalate the child's negative emotions and behavior (Buckholdt et al., 2014). Zhou and Yi (2014) described the "emotional transmission" occurring reciprocally between parents and children following a qualitative study of parents of children with ASD. Parents identified feedback loops that occur as their emotions influence their children's emotions, during both negative and positive emotional experiences. In addition, participants suggested that their negative emotional expression seemed to increase their child's ASD symptoms. Therefore, parent negative emotionality and reactivity do little to remediate the child's behavior, and parent frustration, when poorly managed, drives further child dysregulation.

Parenting style, which refers to parents' general attitude and behavior toward children, also impacts the emotional climate (Darling & Steinber, 1993). Responsive parenting, which is characterized by acceptance, support, and sympathy, is associated with better emotional and social development, greater child ER, and fewer negative emotions in children (Morris et al., 2007; Kliewer et al., 1996; Eisenberg et al., 1991). Responsive parenting affords children the emotional resources to develop appropriate coping skills and ER. By contrast, negative parenting, (e.g., characterized by hostility, psychological control, and insensitivity), is associated with poor child ER (Calkins et al., 1998; Morris et al., 2002). These mechanisms are explained by children's exposure to harsh discipline and control, as well as lack of modeling and support of their emotions.

Overall parenting style and the parenting behaviors that affect child ER have been briefly examined in ASD. Hu et al., (2019) found that parent stress in both mothers and

fathers with children with ASD mediated parent ER and parenting behavior. They found that parents with more ER difficulties had more parenting stress, and those with more stress reported more negative parenting style (i.e., indicated by decreased parental bonding). The authors' theoretical basis for their findings was the stress spillover effect from family systems theory (Nelson et al., 2009), such that a family member's failure to cope effectively with their stress may transfer to their relationships with other family members. As demonstrated by Hu et al., (2019) heightened stress expends a parent's emotional resources and increases their likelihood of relying on less effective parenting behaviors. It is likely that chronic parenting stress wears on overall parenting style and the emotional climate in the home, creating a home environment that is not conducive for children with ASD to learn appropriate ER skills. Given that parents of children with ASD experience the most parent stress, it behooves researchers to investigate the general "wear and tear" of cumulative parent stress on children's behavioral functioning over multiple time points.

Measuring Emotion Regulation Facilitation

A variety of data collection strategies to measure parent facilitation of child ER in ASD are found in the literature. Direct behavioral observation of parenting and child behavior is commonly utilized in studies that measure coregulation processes in families with ASD. For example, several studies have employed variations of a parent coding system of coregulatory parent behavior and support during a situation that evoked either fear for anger in the child (Baker et al., 2018; Guo et al., 2017; Hirchsler-Guttenberg, Golan, et al., 2015; Hirshler-Guttenberg, Feldman, et al., 2015; Laurent & Gorman, 2018; Ting & Weiss, 2017). Observational measures are useful for mitigating social desirability

and recall biases; however, unlike self-report, it is not possible to fully ascertain the intrinsic resources one uses to regulate their own emotions. Accordingly, some emotion coregulation studies have complemented their observational coding with self-report measures, which have included parents' overall negative affect and effortful control of emotional expression (e.g., Hirschler-Guttenberg, Feldman, et al., 2015) and children's self-report of their own ER ability (Ting & Weiss, 2017). Other studies relied exclusively on self-report measures. For example, a few researchers have assessed parent ER through parent coping skills questionnaires, (Bougher-Muckian et al., 2016; Hu et al., 2018; Hu et al., 2019) or through qualitative interviews about emotional transmission (Zhou & Yi, 2014). Additionally, Bader and colleagues primarily utilized a questionnaire to capture the construct of expressed emotion and emotional climate in families (Bader & Barry, 2014; Bader, Barry, & Hann, 2015).

Naturalistic and frequent approaches to data collection (e.g., momentary sampling) are underutilized approaches to studying ER processes in ASD, yet they may be more efficacious in capturing daily fluctuations of parent facilitation of child ER. ER is thought to be a temporal process which can both be anticipated and accommodated for, as well as automatic responses that become habitual (Aldao et al., 2010). One-time observation studies are limited and possibly contrived in laboratory settings. Furthermore, some emotion facilitation practices may be more difficult to capture in laboratory settings, as they are particularly susceptible to social desirability biases (e.g., high expressed emotion). Recently, there has been a general call for studying ER with respect to the context and daily changes in affect (Burke et al., 2017), specifically as it relates to daily fluctuation in parent emotional experience (Kerr et al., 2020). Moreover, little is

known about how momentary changes in parent stress may interact with emotion facilitation approaches, resulting in a negative manifestation of child ER and behavioral functioning. An ecological momentary assessment (EMA) is a useful method to capture the intrinsic and extrinsic influences of parents on child behavior, with respect to the temporal moment and environmental context.

Current Study

Children with ASD are vulnerable to experience marked difficulties with emotion regulation. Thus far, most research in ASD and ER has focused primarily on the child's ability to self-regulate, and limited consideration has been paid to caregiver emotion facilitation of child ER. However, parents and caregivers are the most well-positioned and naturally occurring agents to assist with ER development. In families with ASD, parents influence the emotional tone of the home, which can aggravate or assuage the child's existing difficulties with emotion regulation, and to that end, their behavioral functioning (Bader & Barry, 2014; Baker et al., 2011; Zaidman-Zait et al., 2014). Parents implicitly and explicitly utilize several mechanisms—modeling, coregulation, emotional climate control—to facilitate child ER development, and the same is true for parents of children with ASD. Importantly, high levels of psychological distress hamper parents' ability to respond appropriately to their children's emotional needs (Silva & Schalock, 2012). Though parents of children with ASD report the highest levels of parent stress, it is unclear how much daily stress attenuates parents' emotional facilitation of child ER and its effect on child behavioral functioning. Moreover, EMA methods can elucidate these processes on a momentary level.

The current study aimed to increase knowledge and understanding of parents' facilitation of ER in their children with ASD. Specifically, momentary sampling methods explored 1.) parent ER strategy selection during child behavior problems, 2.) how momentary parent stress and individual tenets of the Tripartite Model impact child behavioral intensity, and 3.) the effect of cumulative parent stress on emotional facilitation throughout the day.

Previous findings have highlighted emotion facilitation processes in families with ASD, yet several gaps remain. The manner which parents regulate their own emotions is a key element of facilitating ER in their children, yet little is known about how parents regulate their own emotions in a moment of challenging child behavior. Following Gross' (2013) process model of ER, 1.) I hypothesize that parents will most often use strategies that modify the situation, compared to other ER processes (e.g., appraisal, attentional deployment, etc.). Next, previous findings have demonstrated that parent stress directly impacts child behavioral functioning in ASD, and parent facilitation of child ER shapes these processes; however, these associations have yet to be explored on a momentary level. Therefore, I hypothesize that 2.) parent ER abilities, response styles to child emotions, and level of expressed emotion will each moderate the association between momentary parent stress and behavioral intensity. Finally, cumulative stress impacts how parent ER influences their parenting behaviors of children with ASD and subsequent child behavioral functioning (e.g., Hu et al., 2019), but the effect of momentary fluctuations of stress is yet unknown. Therefore, I hypothesize that 3.) parents' level of stress in a previous moment will moderate the association between momentary parent stress and child behavior intensity.

CHAPTER 2
METHODS

Participants and Procedure

Participants were 92 caregivers of school-aged children with ASD who were recruited from a larger project focused on families of children with ASD. The majority of parents were mothers (88%), white (59.6%), worked full or part time (51.1%) and had at least a Bachelor's degree (58.7%). The participants' children with ASD were primarily males (73.9%) with an average age of 7.59(1.60) years old. Per parent report, children had comorbid diagnoses of ADHD (44.6%), anxiety disorders (32.6%), and/or intellectual disability/developmental delays (16.5%). Most participants reported caring for two or more children in the home (72.9%), with 25.1% of parents caring for two or more children with disabilities in their home. The larger project surveyed parents about their emotional experiences and ER, child behavior problems, and interactions with their co-caregiver. Inclusion criteria included having a school-aged child (ages 5-11) with ASD, parenting with a co-caregiver, and regularly using a smart phone. Exclusion criteria included having a child who was outside of the age range or who was not diagnosed via a gold standard measure (e.g., ADOS, ADI, CARS-2, etc.). The university institutional review board approved the project. All participants signed a consent form with the initial questionnaire. Parents received a $15 gift card for completing the initial questionnaire and attending a 30-minute virtual training session. Parents received another $15 gift card upon completing 80% of the EMA surveys across 7 days. All participants were entered

into a raffle to win $50 at the end of the study. To encourage fidelity, participants were informed that their responses would be summarized in a personalized report and sent to them following the end of the study.

Participants were recruited through newsletters, community medical clinics, and social media advertising. Interested parents first accessed an online form to provide their contact information. Next, the study coordinator called the individuals to determine eligibility and provide information about the study. Eligible parents completed the initial questionnaire and attended a 30-minute virtual training session with the study coordinator. During the training, the study coordinator explained the study rationale and procedures as well as reviewed the EMA survey questions. Participants completed a practice trial of the EMA survey and had the opportunity to troubleshoot through operator errors and ask for clarification about the items. The survey was deployed via a smart phone application (i.e., the Personal Analytics Companion, or PACO). PACO is free for users and has been utilized in several EMA studies (Cummings et al., 2019; Yang & Conroy, 2018)

The EMA phase lasted at least 7 days, after which participants were permitted to delete the application. Participants were randomly surveyed at 5 time points per day (i.e., at least 35 prompts total), during a participant-selected 12-hour window of time that best captured waking hours (e.g., 8:00 AM to 8:00 PM, 9:00 AM to 9:00 PM, etc.). Only responses that reported a behavioral event were included in the analyses, resulting in a total of 909 responses across all participants (M = 9.65 responses per person; SD = 7.81; range = 1 to 47).

Measures

Initial Questionnaire

Child Characteristics. Parents rated their children's ASD symptomology via the Social Communication Questionnaire (SCQ). The SCQ is a 40-item measure through which parents answer "Yes" or "No" questions regarding their child's current or lifetime characteristics (Rutter et al., 2003). Score is summed as a total of ASD symptoms. An example item is, "Does she/he have any particular friends or a best friend?" The measure was derived from and is strongly correlated with the Autism Diagnostic Interview – Revised (r = .71; Berument et al., 1999), and it has a high internal consistency (α = .87; Rutter et al., 2003).

Parent Characteristics. Participants answered demographic questions that included their gender, age, race, education, and employment status, as well as their child's gender and age. To account for the genetic liability for spectrum-related ER dysfunction, parents completed the Broader Autism Phenotype Questionnaire (BAP-Q; Hurley et al., 2007). The BAP-Q is a 36-item questionnaire that measures personality and language characteristics of direct relatives of people with ASD. Participants rated how often items applied to them on a 6-point Likert-scale from "Very rarely," to "Very often." An example item is "I have a hard time dealing with changes in my routine." For the purpose of the study, the overall BAP-Q score was computed as a sum, with higher scores representing more BAP features. The BAP-Q demonstrated high internal consistency across all items (α = .95) in its validation study.

The measures described below represent the features of the Tripartite Model (Morris et al., 2007).

Observation. Children learn about ER through observation of their parents' modeling of ER strategies; as such, parents' ER difficulties represented their children's exposure to adaptive and/or maladaptive strategies. Parents indicated their specific challenges with ER through the Difficulties in Emotion Regulation, Short Form (DERS-SF; Victor & Klonsky, 2016). The measure is an 18-item questionnaire that records deficits in the subdomains of access to strategies, non-awareness of emotions, impulse control, goal-directed behavior, nonacceptance, and emotional clarity. Subdomains each included 3 items from the DERS-SF, which were summed and included as total scores in analyses. Participants indicated how often they agree with statements on a 5-point Likert-scale from "Almost never (0-10% of the time)" to "Almost always (91-100% of the time)." Example items include "When I'm upset, I acknowledge my emotions," and "When I'm upset, I become out of control." The DERS-SF has a high correlation with the full DERS measure (i.e., r = .90 - .98 across subscales), which had high internal consistency in initial validation studies (i.e., α = .93 overall, and all subscales α > .80; Gratz & Roemer, 2004). All 6 subscales were computed for this study.

Parenting Practices. Specific emotion socialization practices were measured through the Coping with Children's Negative Emotions Scale (CCNES; Fabes et al., 1990). Parents read 12 vignettes about their child experiencing an emotion and indicated how likely they were to respond in specified ways on a 7-point Likert-scale, from "Very unlikely" to "Very likely." As is common in the literature (Fabes et al., 2002), response styles were categorized into either supportive, unsupportive, or distressed responses to

child negative emotions. The supportive subscale includes expressive encouragement (e.g., "tell my child it's okay to cry"), emotion-focused reactions (e.g., "distract my child by thinking about happy things"), and problem focused reactions (e.g., "help my child think of things he could do instead"). The unsupportive subscale includes punitive (e.g., "tell my child to straighten up or we'll go home") and minimizing (e.g., "tell my child he/she is overreacting) responses. Finally, distressed reactions indicate that the parent feels adversely aroused and uncomfortable during the child emotion (e.g., "tell him/her not to embarrass us by crying"). Scores were derived by calculating the mean of each response style. The CNNES has demonstrated adequate internal reliability across the response styles (α = .69 - .85), and the measure has been used in parents of children with ASD in previous studies (e.g., Bougher-Muckian et al., 2016).

Emotional Climate. The Family Questionnaire (FQ) measures the level of expressed emotion toward a child with a mental health problem (Wiedemann et al., 2002), and it is an indicator of the emotional climate in the home. The FQ has 20 items, and participants rate their agreement on a 4-point Likert-scale from "Strongly disagree" to "Strongly agree." Example items include "I have to insist that he/she behave different" and "I'm often angry with him/her." An overall FQ score was summed from all items. In the initial validation trials, internal reliability was high (α = .90 - .92), and the measure has been utilized in samples of parents of children with ASD (e.g., Bader & Berry, 2014, etc.).

EMA Survey

Associations between parent stress and child behavior problems in ASD are well established, yet the role of parent ER facilitation is only partially understood.

Specifically, little is known about how features of the Tripartite Model (Morris et al., 2007), one of the most widely recognized models of parent influence on child ER, interact with parent stress to influence child behavior on a momentary scale. An ecological momentary assessment (EMA) design allows for a nuanced microanalysis of a long-term process, and it permits multilevel modeling of both within-person (momentary) variation and between-person variation (Shiffman et al., 2008). In addition, the EMA design can circumvent recall biases and allow for more ecologically valid data. Importantly, social desirability biases remain a threat to validity in this design, given the self-report nature of this study. However, the participants in this study were incentivized to answer truthfully for the accuracy of their personalized reports. Other limitations included an inability to objectively measure behavior events, and the design did not control for more than one instance of the same behavior in a single interval, nor the potential for reactivity (i.e., participants' behavior influenced by the act of assessing it).

The EMA survey was developed in consultation with the faculty mentor and an outside faculty member who specializes in EMA methods. A draft of the survey was piloted with 3 parents of children with developmental disabilities, and their feedback was solicited using methods of cognitive interviewing for scale construction. One parent suggested that the item about parent ER strategies allowed for multiple selections instead of just one (i.e., "You're [the parent is] not going to just do one. In the midst of really bad things, you have to do something to address the child.") This feedback was incorporated in the final version of the measure. Another parent commented that there were too many questions, which prompted the developers to pare down the survey into a manageable length.

On the final version of the EMA survey, participants indicated their present stress level (i.e., "Low stress" to "High stress") on a Likert-scale of 1 to 9. Participants then indicated the incidence of child challenging behavior(s) and the intensity *since the last survey was completed*. Parents selected as many as applied from 8 strategies representing a range of responses to the challenging behavior and/or indicated "other." Following Gross' (2013) Process Model of Emotion Regulation, the responses fit into the classes of situation modification (i.e., left the room, sought support from another adult, and helped or distracted the child), attentional deployment (i.e., distracted self), cognitive change (i.e., thought differently or more positively about the situation), or response modulation (i.e., expressed emotion or disapproval by raising voice, held in or suppressed emotion, and used a calming strategy). Attentional deployment and cognitive reframing are relatively straightforward so were represented by one option each, but situation modification and response modulation are more dynamic categories and thus included three options each. Due to conceptual limitations (i.e., a parent does not usually self-select into experiencing their child's challenging behaviors), the survey did not include a strategy that represented situation selection. Participants could also select "other strategies" and list them. The EMA survey is included in the Appendix.

Data Analytic Plan

To characterize the sample, basic descriptive statistics and a correlation matrix were conducted for the main study variables. Associations at the within-person and between-person levels were computed, as well as the ICCs of the momentary variables.

Aim 1. The first research aim sought to explore how parents regulate their own emotions in response to their child's behavior. Parents could select as many items as

applicable from a range of ER strategies in response to the emotion-eliciting event. Proportion scores were created to compare each ER strategy across participants. Proportion scores were derived by 1.) creating a dichotomous variable for each of 8 possible responses, 2.) creating a summary score for each option, and 3.) dividing each summary score by total number of responses for each participant.

Aim 2. The second research question aimed to assess how momentary parent stress impacted behavioral intensity in children, and how parent emotion facilitation of child ER impacts the process. Using the Tripartite Model as a framework, separate models were constructed to the test tenets of parent emotion facilitation as predictors and moderators on momentary parent stress and behavioral intensity, after controlling for parent BAP, child ASD symptomatology, and demographic characteristics. The number of days since beginning the EMA phase was also included as a covariate. Behavior intensity was calculated by summing the intensity of each behavior reported at each time point. In Model 1, parent difficulties with ER represented observation and modeling from the parent. In Model 2, participants' pattern of responses (i.e., supportive, unsupportive, or distressed parenting) to their child's emotion represented parent ER facilitation practices. In Model 3, the participants' levels of expressed emotion toward the child characterized the emotional climate of the family.

Models were estimated using multilevel modeling (MLM) to account for the data structure of observations nested within day and within each participant. MLM was most suited for this study as it allows for controlling the influence of person-specific factors, handles missing data, permits time between observations to vary, and accounts for interdependence between within-person observations (Shiffman et al., 2008; Smyth &

Stone, 2003). In line with best practices for momentary sampling studies, all coefficients for intercepts were allowed to randomly vary (Nezlek, 2012). Models were run using restricted estimated maximum likelihood (REML) method in R.4.2.3 (Littell et al., 1996). Predictors in the model were categorized into four different categories: between-person factors, within-person factors, interactions of between- and within-person factors, and the interactions of within-person factors. The intraclass correlation coefficient (ICC) was calculated at each level to determine what proportion of total variance of behavior intensity can be attributed to each hierarchical level (i.e., participant level and day level) before adding any of the other predictors (Singer & Wilet, 2003). Additionally, the pseudo-R^2 was calculated for each model to demonstrate proportion of total variability explained by a set of predictors, widely considered as an effect size estimation of MLM models (Nakagawa & Schielzeth, 2013). Momentary variables were disaggregated into within- and between- person variables, such that "momentary" versus "usual" coefficients were assessed. As the behavior intensity variable had a positive skew and was unevenly distributed (skewness = 1.61, kurtosis = 3.10), the variable was transformed by taking the cubic root (transformed skewness = .40, transformed kurtosis = -.20). All other technical assumptions of MLM (e.g., independence and normal distribution of errors, etc.) within and between levels were met.

The final multilevel models for Models 1-3 are presented below:

Model 1:

Level-1: Behavior intensity$_{it}$ = β_{0i} + β_{1i}(Day in study) + β_{2i}(Momentary stress) + e_{ij}

Level-2: $\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{Child age}_i) + \gamma_{02}(\text{Child gender}_i) + \gamma_{03}(\text{Child ASD symptoms}_i) + \gamma_{04}(\text{Parent BAP}_i) + \gamma_{05}(\text{Parent race}_i) + \gamma_{06}(\text{Parent education}_i) + \gamma_{07}(\text{Usual stress}_i) + \gamma_{08}(\text{Strategies}_i) + \gamma_{09}(\text{Nonacceptance of emotions}_i) + \gamma_{010}(\text{Impulse control}_i) + \gamma_{011}(\text{Goal-directed behavior}_i) + \gamma_{012}(\text{Awareness}_i) + \gamma_{013}(\text{Clarity}_i) + \gamma_{014}(\text{Strategies x Momentary parent stress}_{it}) + \gamma_{015}(\text{Nonacceptance x Momentary parent stress}_{it}) + \gamma_{016}(\text{Impulse control x Momentary parent stress}_{it}) + \gamma_{017}(\text{Goal-directed behavior x Momentary parent stress}_{it}) + \gamma_{018}(\text{Awareness x Momentary parent stress}_{it}) + \gamma_{019}(\text{Clarity x Momentary parent stress}_{it}) + u_{0i}$

$\beta_{(1-2)i} = \gamma_{(1-2)0}$

where γ_{00} represented the intercept for momentary behavioral intensity, γ_{01} to γ_{06} represented the between-person associations between behavioral intensity and Child age, Child gender, Child ASD symptoms, Parent BAP, Parent race, and Parent education, Usual stress (γ_{07}) and difficulties with ER including Strategies, Nonacceptance, Impulse control, Goal-directed behavior, Awareness, and Clarity (γ_{08} to γ_{013}); γ_{014} to γ_{019} represented the associations between difficulties with ER and momentary parent stress. The coefficient u_{0i} is the person-specific residual deviations that is uncorrelated with the momentary-level residual e_{it}. The distribution of error and random effects are assumed to follow a normal distribution.

Model 2:

Level-1: $\text{Behavior intensity}_{it} = \beta_{0i} + \beta_{1i}(\text{Day in study}) + \beta_{2i}(\text{Momentary stress}) + e_{ij}$

Level-2: $\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{Child age}_i) + \gamma_{02}(\text{Child gender}_i) + \gamma_{03}(\text{Child ASD symptoms}_i) + \gamma_{04}(\text{Parent BAP}_i) + \gamma_{05}(\text{Parent race}_i) + \gamma_{06}(\text{Parent education}_i) + \gamma_{07}(\text{Usual stress}_i) + \gamma_{08}(\text{Supportive parenting}_i) + \gamma_{09}(\text{Unsupportive parenting}_i) + \gamma_{10}(\text{Distressed parenting}_i) + \gamma_{11}(\text{Supportive parenting x Momentary parent stress}_{it}) + \gamma_{12}(\text{Unsupportive parenting x Momentary parent stress}_{it}) + \gamma_{13}(\text{Distressed parenting x Momentary parent stress}_{it}) + u_{0i}$

$\beta_{(1\text{ -}2)i} = \gamma_{(1\text{-}2)0}$

where γ_{00} represented the intercept for momentary behavioral intensity, γ_{01} to γ_{06} represented the between-person associations between behavioral intensity and Child age, Child gender, Child ASD symptoms, Parent BAP, Parent race, and Parent education, Usual stress (γ_{07}), and supportive parenting, unsupportive parenting, and distressed parenting (γ_{08} to γ_{010}); γ_{011} to γ_{013} represented the associations between parenting style and momentary parent stress. The coefficient u_{0i} is the person-specific residual deviations that is uncorrelated with the momentary-level residual e_{it}. The distribution of error and random effects are assumed to follow a normal distribution.

Model 3:

Level-1: $\text{Behavior intensity}_{it} = \beta_{0i} + \beta_{1i}(\text{Day in study}) + \beta_{2i}(\text{Momentary stress}) + e_{ij}$

Level-2: $\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{Child age}_i) + \gamma_{02}(\text{Child gender}_i) + \gamma_{03}(\text{Child ASD symptoms}_i) + \gamma_{04}(\text{Parent BAP}_i) + \gamma_{05}(\text{Parent race}_i) + \gamma_{06}(\text{Parent education}_i) + \gamma_{07}(\text{Usual stress}_i) + \gamma_{08}(\text{Expressed emotion}_i) + \gamma_{09}(\text{Expressed emotion x Momentary parent stress}_{it}) + u_{0i}$

$\beta_{(1\text{ -}2)i} = \gamma_{(1\text{-}2)0}$

where γ_{00} represented the intercept for momentary behavioral intensity, γ_{01} to γ_{06} represented the between-person associations between behavioral intensity and Child age, Child gender, Child ASD symptoms, Parent BAP, Parent race, and Parent education, Usual stress (γ_{07}), and expressed emotion (γ_{08}); γ_{09} represented the association between expressed emotion and momentary parent stress. The coefficient u_{0i} is the person-specific residual deviations that is uncorrelated with the momentary-level residual e_{it}. The distribution of error and random effects are assumed to follow a normal distribution.

Aim 3. The third aim of this study was to explore the impact of cumulative parent stress on child behavior. To accomplish this, a time-varying lagged effect variable was created using the previous same-day momentary stress rating (disaggregated). The previous moment's level of stress was added as a predictor and moderator of the association between momentary parent stress and child behavior intensity, while controlling for parent BAP, child ASD symptomatology, demographic characteristics, and day since starting EMA Phase. To accommodate for fewer data points (n = 625) since the first response of the day did not have a lagged stress variable, visual analysis also explored possible moderating effects of accumulated parent stress.

Model 4:

Level-1: Behavior intensity$_{it}$ = β_{0i} + β_{1i}(Day in study) + β_{2i}(Momentary stress) + β_{3i}(Previous momentary stress) + β_{4i}(Momentary stress x Previous momentary stress) + e_{ij}

Level-2: $\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{Child age}_i) + \gamma_{02}(\text{Child gender}_i) + \gamma_{03}(\text{Child ASD symptoms}_i) + \gamma_{04}(\text{Parent BAP}_i) + \gamma_{05}(\text{Parent race}_i) + \gamma_{06}(\text{Parent education}_i) + \gamma_{07}(\text{Usual stress}_i) + \gamma_{08}(\text{Usual previous stress}_i) + u_{0i}$

$\beta_{(1\text{-}4)i} = \gamma_{(1\text{-}4)0}$

where γ_{00} represented the intercept for momentary behavioral intensity, γ_{01} to γ_{06} represented the between-person associations between behavioral intensity and Child age, Child gender, Child ASD symptoms, Parent BAP, Parent race, and Parent education, Usual stress (γ_{07}) and Usual previous stress (γ_{08}); γ_{40} represented the association between previous parent stress and momentary parent stress. The coefficient u_{0i} is the person-specific residual deviations that is uncorrelated with the momentary-level residual e_{it}. The distribution of error and random effects are assumed to follow a normal distribution.

CHAPTER 3
RESULTS

Preliminary Analyses

First, descriptive statistics were calculated for all predictors and included with the correlation matrix (see Table B.1). The ICC for behavioral intensity was 42% and 7% for both the participant level and day level, respectively, which suggested that the remaining 51% of variance was due to within-person fluctuations or measurement error. This estimate justified using a multilevel modeling approach to test both between- and within-person hypotheses. For the sake of parsimony, day level predictors were not the focus of the analyses and are not included in the model notation.

Primary Analyses

Aim 1: Strategy Selection. Examining strategy selection determined the frequency of parent ER responses during child challenging behavior. Parents selected "helped/distracted the child" in an average of 52.9% (*SD* = 0.27; skewness = -0.08) of challenging behavior events, closely followed by "used a calming strategy" in an average of 31% (*SD* = 0.28; skewness = 0.53) of events. Parents chose "expressed my emotion or raised my voice" in an average of 28.8% (*SD* = 0.22; skewness = 0.88) of challenging behaviors and "held in or suppressed emotion" in an average of 28% (*SD* = 0.25; skewness = 0.85) of the events. Parents were least likely to choose "left the room" (*M* = 12.9%; *SD* = 0.17; skewness = 2.05), "thought differently or more positively about the

situation" (*M* = 12.8%; *SD* = 0.17; skewness = 1.99), "distracted myself" (*M* = 11%; *SD* = 0.13; skewness = 1.23), or "sought help from another adult" (*M* = 17.8%; *SD* = 0.19; skewness = 1.33).

Aim 2: Tripartite Model. MLM analyses and visual inspection indicated partial support for hypotheses about each of the three arms of the Tripartite Model. In Model 1, momentary parent stress (b = 0.10, $p < .001$) and impulse control (b = 0.04, $p < .05$) were predictors of behavioral intensity, whereas access to strategies (b = 0.02, $p < .01$), impulse control (b = -0.01, $p < .05$), and goal-directed behavior (b = -0.01, $p < .05$) were all significant moderators on the relationship between momentary parent stress and behavioral functioning. The pseudo-R^2 indicated that the fixed effects of all the predictors in this model accounted for approximately 21% of the variance in momentary behavioral intensity. Figure B.1 (see Appendix B) demonstrates the moderating effect of difficulties with strategy selection; moreover, at average to high levels of stress, greater difficulties were related to higher behavioral intensity. In Figure C.1, the moderating effect of difficulties with impulse control suggests that, at below average to above average levels of stress, greater difficulties were associated with higher behavior intensity; however, at the maximum level of parent stress, there was little to no association between impulse control and behavioral intensity. Figure D.1 demonstrates the moderating effect of difficulties with goal-directed behavior, such that at below average levels of stress, more difficulties were related to higher behavior intensity; however, at above average to high levels of stress, more difficulties were related to lower behavior intensity. It is noted that neither parent BAP nor child ASD symptoms emerged as significant predictors.

In Model 2, momentary parent stress (b = 0.14, $p < .05$), and unsupportive parenting (b = 0.15, $p < .01$) were predictors of behavioral intensity, whereas distressed parenting (b = -0.03, $p < .05$) was a significant moderator. The pseudo-R^2 indicated that the fixed effects of all the predictors in this model accounted for approximately 21% of the variance in momentary behavioral intensity. Figure E.1 demonstrates the moderating effect of distressed parenting, such that at below average levels of stress, more distressed parenting was related to greater behavior problems; however, at average to high levels of stress, more distressed parenting was related to fewer behavior problems.

Finally, in Model 3, momentary parent stress (b = 0.12, $p < .05$) and expressed emotion (b = 0.01, $p < .05$) were significant predictors of behavioral intensity, but expressed emotion did not moderate the relationship ($p > .05$). The pseudo-R^2 indicated that the fixed effects of all the predictors in this model accounted for approximately 17% of the variance in momentary behavioral intensity. All 3 models are summarized in their respective tables (i.e., see Appendix B for Tables C.1, D.1, E.1).

Aim 3: Parent cumulative stress. MLM analyses and visual inspection partially supported a lagged stress effect. In Model 4, momentary stress (b = 0.07, $p < .001$) was a significant predictor for behavioral intensity. The time-varying lagged effect of stress approached significance as a moderator for the relationship between parent stress and child behavior (b = 0.002, $p = .07$), such that a lower level of stress at the previous moment reduced the impact of parent stress on child behavior problems. The pseudo-R^2 indicated that the fixed effects of all the predictors in this model accounted for approximately 15% of the variance in momentary behavioral intensity. Figure F.1 demonstrates the interaction between lagged parent stress and parent stress on child

behavior, such that greater behavioral problems are expected at higher levels of lagged stress and momentary stress.

CHAPTER 4

DISCUSSION

The current study applied an ecologically valid approach to understanding the role of emotion facilitation on the association between parent stress and child behavior problems in ASD. A meaningful contribution of this study was highlighting how parents respond to their own emotional experiences of stress during child behavior, with respect to fluctuations in emotions and without threat of recall bias. In addition, results supported several hypotheses by elucidating how tenets of the Tripartite Model interact with momentary parent stress to influence child behavior. These findings indicate partial support for a cumulative effect of parent stress on child behavior, complementing prior research on the spillover effects of parent stress in ASD (Hu et al., 2019). To the author's knowledge, this is the first study to use experience sampling methods to investigate momentary experiences of parent stress and child behavior in ASD.

As others have documented (e.g., Eisenberg et al., 1998), children observe and learn from the manner through which their parents regulate their own emotions. This is particularly salient for children with ASD, as they are more likely to have ER difficulties than their TD peers (Weiss et al., 2014), and their parents are more likely to have higher levels of stress with which to cope (Hayes & Watson, 2013), which affects parenting behavior (Hu et al., 2019). This study demonstrated that parents attempted to help or distract their child in over half of the behavior events. This finding is consistent with Ting and Weiss (2017), as parents of school-aged children with ASD often use direct and

active approaches to help their child co-regulate. Moreover, tending to the problem, particularly when the child's emotion is anger, is commonly the first line of defense when responding to child behavior (Hirschler-Guttenburg, Feldman, et al., 2015); in other words, per the Process Model of Emotion, parents often choose to modify the situation by helping their child, compared with attentional deployment, cognitive change, or response modulation (Gross, et al., 2013). It is possible that parents who frequently step in to help their child may prevent the child from independently regulating themselves, a skill that is expected for school-aged children. Moreover, previous findings have highlighted that parents of children with ASD use more direct and physical coregulation strategies when they feel heightened stress (Gulsurd et al., 2010), yet children require less coregulatory support from parents as they get older (Fenning et al., 2019). Therefore, it is important for parents to be mindful of how their preferred method of ER could hinder their child's emotional development, and instead they should consider opportunities to guide their child through regulating emotions in a manner appropriate to their developmental level.

Additional findings were that parents were likely to express their emotion or raise their voice, suppress or hold in their emotion, and/or use a calming strategy during challenging child behavior. Though on the surface they sound diametrically opposed, heightened emotional expression and emotional suppression are both emotion-focused strategies, which are related to increased parent pessimism and ASD symptomatology (Lyons et al, 2010) and are generally viewed as less adaptive strategies (Gross & John, 2003). From a behaviorist perspective, expressed emotion may draw attention to and reinforce negative child behavior, whereas suppressing emotion may limit attention; moreover, behavior therapists frequently recommend withdrawing attention from

negative behavior (Petscher et al, 2009). Nonetheless, equipping parents with knowledge of how and when to appropriately respond to their own emotions is key to achieving the delicate balance of parent ER and behavior management. Fortunately, regular use of calming strategies, such as deep breathing and mindfulness, is a well-established adaptive ER strategy (Sheppes & Gross, 2012), which means that the parents in this sample possessed some adaptive coping strategies in response to child behavior.

Finally, parents reported low frequencies of using cognitive reappraisal, seeking support, and distracting self, which are widely considered as adaptive ER strategies affiliated with positive emotional outcomes for parents (Bertie et al., 2021; Gross & John, 2003). This observation supports previous findings that parents of children with ASD are less likely to seek social-support and use more avoidance strategies (Vernhet et al., 2018). As cognitive reappraisal and distraction coping have been associated with better wellbeing in parents of children with ASD (Costas et al., 2017; Lyons et al., 2010), this could be an important entry point for interventions supporting adaptive parent ER.

Though ER is a multifaceted construct, this study demonstrated that certain aspects of ER are particularly salient in parent emotion facilitation for children with ASD. For example, parents who indicated less difficulties both accessing ER strategies and controlling impulses reported lower child behavioral intensity at elevated levels of parent stress. These results suggest that parents with greater access to ER strategies, as well as the ability to control their own behaviors when they are upset, fared better when it came to child behavior. On the other hand, less difficulties with goal-directed ER behavior resulted in more behavioral problems at average to high levels of stress. In other words, there was less of an effect of parent stress on child behaviors when parents

reported that they experience greater difficulty concentrating and getting work done when they are upset. Parents flooded by their own emotions may interact less with their child during moments of high parent stress, thereby reducing the effect on child behavior. Alternatively, parents who can achieve goal-directed behavior when upset may unintentionally contribute to child behavior, perhaps by using ineffective strategies to cope with stress or manage child behavior. These findings collectively align with prior research that demonstrates parents with greater ER difficulties respond poorly to child ER as a result of becoming overwhelmed by strong emotions (Buckholdt et al., 2014; Maliken & Katz, 2013). Clinicians who work with parents of children with ASD should target specific facets of ER, so parents are equipped to manage their stress during child behavior.

Contrary to previous literature supporting their relevance with emotion facilitation processes, syndrome-specific effects were absent from final models. For example, parent BAP did not emerge as a predictor of child behavior problems, though it is associated with child social-emotional competence elsewhere (Crowell et al., 2019; Delucia et al., 2022). Likewise, ASD symptomatology was not associated with child behavior, though others have found relationships between communication ability and coregulation strategies (Laurent & Gorman, 2018). As this area of research is in its infancy, little is known about how parent BAP and ASD symptomatology impacts parent emotion facilitation of child ER and subsequent child behavior. Given the close association between social functioning and ER, future work is needed to develop testable theories of these processes.

In line with the Tripartite Model and previous findings (Bougher-Muckian et al., 2016; Moffitt et al., 2021; Morris et al., 2007) specific parenting styles were related to child ER and subsequent behavior problems in ASD. Unsupportive parenting, characterized by minimizing and invalidating child emotions, was associated with increased behavioral intensity. Similar to previous work using physiological measures (Moffit et al., 2021), it appears that unsupportive parenting may generally not promote emotional competence and behavioral functioning in children with ASD. On the other hand, supportive parenting, which includes emotion- and problem- focused responses, was not significantly associated with behavioral intensity, contrary to findings with TD children (Cole et al., 2009; Davidov & Grusec, 2006; Raver 2004). As children with ASD have multi-factorial difficulties with ER (Cibralic et al., 2019) yet generally respond well to parent extrinsic support and co-regulation (Gulsrud et al., 2010, etc.), supportive parenting, defined broadly, may have little effect on child behavior. Instead, there are likely context-dependent and specific supportive parenting behaviors and/or scaffolding techniques, that make a difference in child emotional competence and behavioral functioning.

Findings were mixed regarding distressed parenting responses. At below average levels of stress, more parent discomfort with child emotion was a risk factor for greater child behavioral intensity, similar to TD children (Jones et al., 2002; Hurrell et al, 2015). However, at average to above average levels of stress, less distressed parenting was related to worse child behavior. These findings suggest some nuance when determining how to best respond to child emotion in a manner which decreases the occurrences of challenging behavior; for example, parents who report more distressed parenting style

may engage in less coordinated responses to child emotion, leading to greater behavioral difficulties. However, they may become more active during periods of high stress and seek to pacify the challenging behavior, due to a lower threshold for discomfort, resulting in decreased child behavior. Taken together, these results offer some guidance for co-regulation by elucidating what kinds of parenting responses (e.g., supportive, unsupportive, distressed, etc.) are generally helpful or harmful for children's emotional and behavioral development.

Expressed emotion was a significant predictor of child behavior problems while controlling for parent stress. This extends previous work (e.g., Bader & Barry, 2014) by demonstrating the effect of high expressed emotion on child behavior on a momentary level. An unexpected finding was that expressed emotion did not influence the association between momentary parent stress and child behavior. Expressed emotion may uniquely impact child emotional and behavioral functioning. People who demonstrate more criticism and less warmth toward their children (i.e., higher expressed emotion), may be more likely to respond strongly during experiences of high stress leading to increased child behavior, perpetuating a coercive cycle (Buckholdt et al., 2014; Zhou & Yi, 2014). It is possible that expressed emotion as a parental characteristic has a more enduring impact on child behavior, independent of the momentary level of parent stress.

Partial support emerged for the role of cumulative parent stress on child behavior. The interaction of the lagged effect of stress on parent stress and child behavior approached significance. Visual analysis indicated that the previous level of stress was a risk factor for worsening child behavior. This trend may be partially explained by other research demonstrating that heightened parent stress negatively affects parenting

behavior in ASD (Hu et al., 2019). As such, a buildup of parent stress hampers emotion facilitation of child ER. Thus, parents should become aware of their stress buildup and cope adaptively with their own emotions, which may look like a "cooldown" period or break for themselves, to have greater emotional reserves for managing future child behavior. Ultimately, increasing awareness of the cumulative effect of parent stress is critical, as feelings of intense stress make it more challenging for parents to access adaptive ER strategies for themselves (Buckholdt et al., 2014; Mackler & Kelleher, et al., 2015), leading to negative effects on child behavior.

This study has many strengths as one of the first to comprehensively examine parent emotion facilitation of ER for children with ASD. Unlike previous work examining perceived parent stress and child behavior at one point in time (Hayes & Watson, 2013, etc.), this study employed repeated measures to examine this association on a momentary level. It is worth noting that momentary parent stress, and not usual parent stress, consistently emerged as a significant predictor for child behavior across all models. Experience sampling methods allowed for investigation of how momentary fluctuations of parent stress affected child behavior. Though aspects of ER facilitation may be longstanding characteristics of parents, this study demonstrated that the effects on child behavior fluctuate with parent stress and should be examined at the momentary level. These findings draw attention to useful targets for parent training and support the growing body of literature that considers parent ER in behavior interventions for children (Bertie et al., 2021; Hajal & Paley, 2020; Maliken & Katz, 2013). Finally, this sample of parents was racially/ethnically, financially, and educationally diverse, perhaps as a result of recruiting from community partners. Children were a representative sample of school-

aged children with ASD, with a ratio of male to female children (i.e., 4 males to 1 female) that is similar to the national average (Maenner et al., 2023). However, only 16.5% of the sample had a parent-reported diagnosis of intellectual disability or developmental delay, compared with the national average of 37.9% of children with ASD classified as having an intellectual disability, suggesting that the cognitive ability of the sample was skewed.

Several limitations of the study are worth noting. First, the EMA design lends itself to threats of internal validity. For example, social desirability may have influenced parent responses, as well as possible reactivity to repeated questions (e.g., having greater awareness of possible ER strategies). In future work, objective physiological measures of stress (e.g., heartrate, cortisol, etc.), may provide more reliable measures of stress. Moreover, the study design did not permit participants to link ER strategies, which were not mutually exclusive, to specific child behaviors, nor could they list the sequence of the events, which would have been relevant to understand the full context of their choices. Though many parents took advantage of the open-ended final question, (i.e., "Is there anything else since the last prompt that you think we should know?"), the data was too limited to draw any meaningful conclusions about how or why parents chose certain ER strategies. Further, fathers were underrepresented in this study, which means that possible gender effects of parent facilitation of child ER were not captured. The responses per participant varied, leading to missing data, but examination of the characteristics of the low responders were unremarkable. A relatively small subset of the momentary data was used in final analyses, as only responses that reported a behavioral event were included;

however, more frequent prompts or a longer study duration may have produced a more robust and statistically meaningful sample size.

Future work should expand on the momentary association between parent stress and child behavior by examining clinical implications. For example, the application of parenting interventions could be a potential mediator for parent stress and child behavior. Parents could report on their use of ER strategies learned within the context of treatment, and the relationships between parent and child wellbeing can be further explored. Moreover, the data may elicit greater refinement of appropriate coregulation and scaffolding strategies. Ultimately, this study provides important insight into how to support parents of children with ASD to effectively manage child behavior by way of emotion facilitation, which will guide future research with families as well as intervention development.

REFERENCES

Abidin, R. R. (1992). The Determinants of Parenting Behavior. In *Journal of Clinical Child Psychology (21)* 4, 407–412. https://doi.org/10.1207/s15374424jccp2104

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, *30*(2), 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

American Psychiatric Association. (2022). *Diagnostic and Statistical Manual of Mental Disorders, Text Revision* (5th ed.). American Psychiatric Publishing.

Are, F., & Shaffer, A. (2016). Family emotion expressiveness mediates the relations between maternal emotion regulation and child emotion regulation. *Child Psychiatry and Human Development*, *47*(5), 708–715. https://doi.org/10.1007/s10578-015-0605-4

Bader, S. H., & Barry, T. D. (2014). A longitudinal examination of the relation between parental expressed emotion and externalizing behaviors in children and adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *44*(11), 2820–2831. https://doi.org/10.1007/s10803-014-2142-6

Bader, S. H., Barry, T. D., & Hann, J. A. H. (2015). The relation between parental expressed emotion and externalizing behaviors in children and adolescents with an autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities*, *30*(1), 23–34. https://doi.org/10.1177/1088357614523065

Berry, J. O., & Jones, W. J. (1995). The parental stress scale: Initial psychometric evidence. *Journal of Social and Personal Relationships, 12*(3), 463-.

Bertie, L., Johnston, K., & Lill, S. (2021) Parental emotion socialisation of young children and the mediating role of emotion regulation, *Australian Journal of Psychology, 73*(3), 293-305. https://doi.org/10.1080/00049530.2021.1884001

Bougher-Muckian, H. R., Root, A. E., Coogle, C. G., & Floyd, K. K. (2016). The importance of emotions: the socialisation of emotion in parents of children with autism spectrum disorder. *Early Child Development and Care, 186*(10), 1584–1593. https://doi.org/10.1080/03004430.2015.1112799

Buckholdt, K. E., Parra, G. R., & Jobe-Shields, L. (2014). Intergenerational transmission of emotion dysregulation through parental invalidation of emotions: Implications for adolescent internalizing and externalizing behaviors. *Journal of Child and Family Studies, 23*(2), 324–332. https://doi.org/10.1007/s10826-013-9768-4

Breaux, R., Eadeh, H. M., Swanson, C. S., & McQuade, J. D. (2022). Adolescent emotionality and emotion regulation in the context of parent emotion socialization among adolescents with neurodevelopmental disorders: A call to action with pilot data. *Research on Child and Adolescent Psychopathology, 50*(1), 77-88.

Cai, R. Y., Richdale, A. L., Uljarević, M., Dissanayake, C., & Samson, A. C. (2018). Emotion regulation in autism spectrum disorder: Where we are and where we need to go. *Autism Research, 11*(7), 962–978. https://doi.org/10.1002/aur.1968

Calkins, S. D., & Hill, A. (2007). Caregiver influences on emerging emotion regulation. In *Handbook of Emotion Regulation* (pp. 229–248).

Calkins, S. D., Smith, C. L., Gill, K. L., & Johnson, M. C. (1998). Maternal interactive style across contexts: Relations to emotional, behavioral and physiological regulation during toddlerhood. *Social Development*, *7*(3), 350–369. https://doi.org/10.1111/1467-9507.00072

Cibralic, S., Kohlhoff, J., Wallace, N., McMahon, C., & Eapen, V. (2019). A systematic review of emotion regulation in children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *68*(October), 101422. https://doi.org/10.1016/j.rasd.2019.101422

Cole, P. M., Dennis, T. A., Smith-Simon, K. E., & Cohen, L. H. (2009). Preschoolers' emotion regulation strategy understanding: Relations with emotion socialization and child self-regulation. *Social Development*, *18*(2), 324–352. https://doi.org/10.1111/j.1467-9507.2008.00503.x

Cole, P., Michel, M., & O'Donnell, L. (1994). The development of emotion regulation and dysregulation : A clinical perspective. In *The Development of Emotion Regulation: Biological and Behavioral Considerations* (pp. 73–100).

Costa, A. P., Steffgen, G., & Ferring, D. (2017). Contributors to well-being and stress in parents of children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *37*, 61–72. https://doi.org/10.1016/j.rasd.2017.01.007

Crowell, J. A., Keluskar, J., & Gorecki, A. (2019). Parenting behavior and the development of children with autism spectrum disorder. *Comprehensive Psychiatry, 90*, 21–29. https://doi.org/10.1016/j.comppsych.2018.11.007

Cummings, M. E., & Davies, P. T. (2002). Effects of marital conflict on children: Recent advances and emerging themes in process-oriented research. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 43*(1), 31–63. https://doi.org/10.1111/1469-7610.00003

Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development, 77*(1), 44–58. https://doi.org/10.1111/j.1467-8624.2006.00855.x

Deater-Deckard, K., & Scarr, S. (1996). Parenting stress among dual-earner mothers and fathers: Are there gender differences? *Journal of Family Psychology, 10*(1), 45–59. https://doi.org/10.1037/0893-3200.10.1.45

DeLucia, E. A., McKenna, M. P., Andrzejewski, T. M., Valentino, K., & McDonnell, C. G. (2021). A pilot study of self-regulation and behavior problems in preschoolers with ASD: parent broader autism phenotype traits relate to child emotion regulation and inhibitory control. *Journal of Autism and Developmental Disorders, 52*(10),1-15

Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry, 9*(4), 241–273. https://doi.org/10.1207/s15327965pli0904

Eisenberg, N., Fabes, R. A., Schaller, M., Carlo, G., & Miller, P. A. (1991). The Relations of Parental Characteristics and Practices to Children's Vicarious Emotional Responding. *Child Development*, *62*(6), 1393. https://doi.org/10.2307/1130814

Eisenberg, N., Guthrie, I. K., Fabes, R. A., Shepard, S., Losoya, S., Murphy, B. C., Jones, S., Poulin, R., & Reiser, M. (2000). Prediction of elementary school children's externalizing problem behaviors from attentional and behavioral regulation and negative emotionality. *Child Development, 71*(5), 1367–1382. https://doi.org/10.1111/1467-8624.00233

Fabes, R. A., Poulin, R. E., Eisenberg, N., & Madden-Derdich, D. A. (2002). The Coping with Children's Negative Emotions Scale (CCNES): Psychometric properties and relations with children's emotional competence. *Marriage & Family Review*, *34*(3-4), 285-310.

Fabes, R. A., Eisenberg, N., & Miller, P. A. (1990). Maternal correlates of children's vicarious emotional responsiveness. *Developmental Psychology*, *26*(4), 639–648. https://doi.org/10.1037/0012-1649.26.4.639

Fenning, R. M., Baker, J. K., & Moffitt, J. (2018). Intrinsic and extrinsic predictors of emotion regulation in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *48*(11), 3858–3870. https://doi.org/10.1007/s10803-018-3647-1

Gottman, J., Katz, L., & Hooven, C. (1997). Introduction to the concept of meta-emotion. In *Meta-emotion. How families communicate emotionally* (pp. 2–8).

Gross, J. J. (2013). *Handbook of Emotion Regulation*. Guilford P.

Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*(1), 224–237. https://doi.org/10.1037//0022-3514.74.1.224

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Gulsrud, A. C., Jahromi, L. B., & Kasari, C. (2010). The co-regulation of emotions between mothers and their children with autism. *Journal of Autism and Developmental Disorders, 40*(2), 227–237. https://doi.org/10.1007/s10803-009-0861-x

Halberstadt, A. G., & Eaton, K. L. (2002). A meta-analysis of family expressiveness and children's emotion expressiveness and understanding. *Marriage and Family Review*, *34*(1–2), 35–62. https://doi.org/10.1300/J002v34n01_03

Hajal, N. J., & Paley, B. (2020). Parental emotion and emotion regulation: A critical target of study for research and intervention to promote child emotion socialization. *Developmental Psychology, 56*(3), 403–417. https://doi.org/10.1037/dev0000864

Hastings, R. P., & Lloyd, T. (2006). Expressed emotion in families of children and adults with intellectual disabilities. *Mental Retardation & Developmental Disabilities Research Reviews*, *13*(October), 339–345. https://doi.org/10.1002/mrdd

Hayes, S., & Watson, S. (2013). The impact of parenting stress: A meta-analysis of studies comparing the experience of parenting stress in parents of children with and without autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *43*(3), 629–642. https://doi.org/10.1007/s10803-012-1604-y

Hirschler-Guttenberg, Y., Feldman, R., Ostfeld-Etzion, S., Laor, N., & Golan, O. (2015). Self- and co-regulation of anger and fear in preschoolers with autism spectrum disorders: The role of maternal parenting style and temperament. *Journal of Autism and Developmental Disorders*, *45*(9), 3004–3014. https://doi.org/10.1007/s10803-015-2464-z

Hirschler-Guttenberg, Y., Golan, O., Ostfeld-Etzion, S., & Feldman, R. (2015). Mothering, fathering, and the regulation of negative and positive emotions in high-functioning preschoolers with autism spectrum disorder. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *56*(5), 530–539. https://doi.org/10.1111/jcpp.12311

Hoffman, C., Crnic, K. A., & Baker, J. K. (2006). Maternal depression and parenting: Implications for children's emergent emotion regulation and behavioral functioning. *Parenting: Science and Practice*, *6*(4), 271–295. https://doi.org/10.1207/s15327922par0604_1

Hu, X., Han, Z. R., Bai, L., & Gao, M. M. (2019). The mediating role of parenting stress in the relations between parental emotion regulation and parenting behaviors in Chinese families of children with autism spectrum disorders: A dyadic analysis. *Journal of Autism and Developmental Disorders*, *49*(10), 3983–3998. https://doi.org/10.1007/s10803-019-04103-z

Hu, X., Han, Z. R., Wang, H., Hu, Y., Wang, Q., Feng, S., & Yi, L. (2018). The relation of parental emotion regulation to child autism spectrum disorder core symptoms: The moderating role of child cardiac vagal activity. *Frontiers in Psychology*, *9*(DEC), 1–10. https://doi.org/10.3389/fpsyg.2018.02480

Hurley, R. S. E., Losh, M., Parlier, M., Reznick, J. S., & Piven, J. (2007). The broad autism phenotype questionnaire. *Journal of Autism and Developmental Disorders*, *37*(9), 1679–1690. https://doi.org/10.1007/s10803-006-0299-3

Hurrell, K. Hudson, J., & Schnering, C. (2015) Parental reactions to children's negative emotions: Relationships with emotion regulation in children with an anxiety disorder. Journal of Anxiety Disorders, 29, 72-82. https://doi.org/10.1016/j.janxdis.2014.10.008

Jones, L., Hastings, R. P., Totsika, V., Keane, L., & Rhule, N. (2014). Child behavior problems and parental well-being in families of children with autism: The mediating role of mindfulness and acceptance. *American Journal on Intellectual and Developmental Disabilities*, *119*(2), 171–185. https://doi.org/10.1352/1944-7558-119.2.171

Jones, S., Eisenberg, N., Fabes, R. A., & MacKinnon, D. P. (2002). Parents' reactions to elementary school children's negative emotions: Relations to social and emotional functioning at school. *Merrill-Palmer Quarterly, 48*(2), 133–159. https://doi.org/10.1353/mpq.2002.0007

Kerr, M. L., Rasmussen, H. F., Buttitta, K. V., Smiley, P. A., & Borelli, J. L. (2020). Exploring the complexity of mothers' real-time emotions while caregiving. *Emotion (21)*3, 545-556. https://doi.org/10.1037/emo0000719

Kliewer, W., Fearnow, M. D., & Miller, P. A. (1996). Coping socialization in middle childhood: Tests of maternal and paternal influences, *Child Development 67*(5), 2339-2357. https://dpi.org/10.1111/j.1467-8624.1996.tb01861.x

Laurent, A. C., & Gorman, K. (2018). Development of emotion self-regulation among young children with autism spectrum disorders: The role of parents. *Journal of Autism and Developmental Disorders, 48*(4), 1249–1260. https://doi.org/10.1007/s10803-017-3430-8

Littell, R. C., Milliken, G. A., Stroup, W. W., & Wolfinger, R. D. (1996). *SAS system for mixed models.* SAS Institute.

Losh, M., Childress, D., Lam, K., & Piven, J. (2008). Defining key features of the broad autism phenotype: A comparison across parents of multiple- and single-incidence autism families. *American Journal of Medical Genetics, Part B: Neuropsychiatric Genetics, 147*(4), 424–433. https://doi.org/10.1002/ajmg.b.30612

Lyons, A. M., Leon, S. C., Roecker Phelps, C. E., & Dunleavy, A. M. (2010). The impact of child symptom severity on stress among parents of children with ASD: The moderating role of coping styles. *Journal of Child and Family Studies, 19*(4), 516–524. https://doi.org/10.1007/s10826-009-9323-5

Mackler, Kelleher, R. T., Shanahan, L., Calkins, S. D., Keane, S. P., & O'Brien, M. (2015). Parenting stress, parental reactions, and externalizing behavior from ages 4 to 10. *Journal of Marriage and Family, 77*(2), 388–406. https://doi.org/10.1111/jomf.12163

Maenner, M. J., Warren, Z., Williams, A. R., Robinson Williams, A., Amoakohene, E., Bakian, A. V., Bilder, D. A., Durkin, M. S., Fitzgerald, R. T., Furnier, S. M., Hughes, M. M., Ladd-Acosta, C. M., McArthur, D., Pas, E. T., Salinas, A., Vehorn, A., Williams, S., Esler, A., Grzbowski, A….Shaw, K. A. (2023) Prevalence and characteristics of autism spectrum disorder among children aged 8 years—Autism and developmental disabilities monitoring network, 11 sites, United States, 2020. *Surveillance Summaries, 72*(3), 1-14, http://dx.doi.org/10.15585/mmwr.ss7202a1

Maliken, A. C., & Katz, L. F. (2013). Exploring the impact of parental psychopathology and emotion regulation on evidence-based parenting interventions: A transdiagnostic approach to improving treatment effectiveness. *Clinical Child and Family Psychology Review, 16*(2), 173–186. https://doi.org/10.1007/s10567-013-0132-4

Mazefsky, C. A., & White, S. W. (2014). Emotion Regulation. Concepts & Practice in Autism Spectrum Disorder. *Child and Adolescent Psychiatric Clinics of North America*, *23*(1), 15–24. https://doi.org/10.1016/j.chc.2013.07.002

Moffitt, J. M., Baker, J. K., Fenning, R. M., Erath, S. A., Messinger, D. S., Zeedyk, S. M., Paez, S.A., & Seel, S. (2021). Parental socialization of emotion and psychophysiological arousal patterns in children with autism spectrum disorder. *Research on Child and Adolescent Psychopathology, 49*, 401-412.

Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development*, *16*(2), 361–388. https://doi.org/10.1111/j.1467-9507.2007.00389.x

Morris, A. S., Silk, J. S., Steinberg, L., Sessa, F. M., Avenevoli, S., & Essex, M. J. (2002). Temperamental vulnerability and negative parenting as interacting predictors of child adjustment. *Journal of Marriage and Family*, *64*(2), 461–471. https://doi.org/10.1111/j.1741-3737.2002.00461.x

Nelson, J. A., Brien, M. O., & Keane, S. P. (2010). Family stress and parental response to children's negative emotions. *Journal of Family Psychology*, *23*(5), 671–679. https://doi.org/10.1037/a0015977.Family

Nezlek, J. B. (2012). *Diary methods*. Sage.

Osborne, L. A., & Reed, P. (2009). The relationship between parenting stress and behavior problems of children with autistic spectrum disorders. *Exceptional Children, 76*(1), 54–73. https://doi.org/10.1177/001440290907600103

Patterson, G. R. (1982). *Coercive Family Process (Vol. 3)*. Castalia Publishing Company.

Petscher, E. S., Rey, C., & Bailey, J. S. (2009). A review of empirical support for differential reinforcement of alternative behavior. *Research in Developmental Disabilities, 30*(3), 409-425. https://doi.org/10.1016/j.ridd.2008.08.008

Piven, J., Palmer, P., Jacobi, D., Childress, D., & Arndt, S. (1997). Broader autism phenotype: Evidence from a family history study of multiple-incidence autism families. *American Journal of Psychiatry, 154*(2), 185–190. https://doi.org/10.1176/ajp.154.2.185

Raver, C. C. (2004). Placing emotional self-regulation in sociocultural and socioeconomic contexts. *Child Development, 75*(2), 346–353. https://doi.org/10.1111/j.1467-8624.2004.00676.x

Rutter, M., Bailey, A., & Lord, C. (2003). *The Social Communication Questionnaire*. Western Psychological Services.

Sanders, W., Zeman, J., Poon, J., & Miller, R. (2015). Child regulation of negative emotions and depressive symptoms: The moderating role of parental emotion socialization. *Journal of Child and Family Studies, 24*(2), 402–415. https://doi.org/10.1007/s10826-013-9850-y

Sasson, N. J., Lam, K. S. L., Parlier, M., Daniels, J. L., & Piven, J. (2013). Autism and the broad autism phenotype: Familial patterns and intergenerational transmission.

Journal of Neurodevelopmental Disorders, *5*(1), 1–7. https://doi.org/10.1186/1866-1955-5-11

Shaffer, A., Suveg, C., Thomassin, K., & Bradbury, L. L. (2012). Emotion socialization in the context of family risks: Links to child emotion regulation. *Journal of Child and Family Studies*, *21*(6), 917–924. https://doi.org/10.1007/s10826-011-9551-3

Sheppes, G., & Gross, J. (2012) Emotion regulation effectiveness: What works when. In *Handbook of Psychology.* Guilford P.

Shiffman, S., Stone, A. A., & Hufford, M. (2008). *Ecological Momentary Assessment*. 822–823. https://doi.org/10.1146/annurev.clinpsy.3.022806.091415

Silkenbeumer, J., Schiller, E.-M., Holodynski, M., & Kärtner, J. (2016). The role of co-regulation for the development of social-emotional competence. *Journal of Self-Regulation and Regulation*, *2*, 16–33. https://doi.org/10.11588/josar.2016.2.34351

Silva, L. M. T., & Schalock, M. (2012). Autism parenting stress index: Initial psychometric evidence. *Journal of Autism and Developmental Disorders*, *42*(4), 566–574. https://doi.org/10.1007/s10803-011-1274-1

Singer, J. D., & Willett, J. B. (2003). Modeling change and event occurrence. In *Applied Longitudinal Data Analysis*. Oxford University Press.

Smyth, J. M., & Stone, A. A. (2003). *Ecological momentary assessment research in behavioral medicine*. 35–52.

Thompson, R. A. (2013). The socialization of emotion regulation in the family. *Handbook of Emotion Regulation, 2013*, 249–268. https://doi.org/10.1007/s10826-011-9551-3

Ting, V., & Weiss, J. A. (2017). Emotion regulation and parent co-regulation in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *47*(3), 680–689. https://doi.org/10.1007/s10803-016-3009-9

Valentovich, V., Goldberg, W. A., Garfin, D. R., & Guo, Y. (2018). Emotion coregulation processes between mothers and their children with and without autism spectrum disorder: Associations with children's maladaptive behaviors. *Journal of Autism and Developmental Disorders*, *48*(4), 1235–1248. https://doi.org/10.1007/s10803-017-3375-y

Van Steijn, D. J., Oerlemans, A. M., Van Aken, M. A. G., Buitelaar, J. K., & Rommelse, N. N. J. (2014). The reciprocal relationship of ASD, ADHD, depressive symptoms and stress in parents of children with ASD and/or ADHD. *Journal of Autism and Developmental Disorders*, *44*(1064–1076). https://doi.org/10.1007/s10803-013-1958-9

Vernhet, C., Dellapiazza, F., Blanc, N., Cousson-Gélie, F., Miot, S., Roeyers, H., & Baghdadli, A. (2019). Coping strategies of parents of children with autism spectrum disorder: a systematic review. *European Child and Adolescent Psychiatry*, *28*(6), 747–758. https://doi.org/10.1007/s00787-018-1183-3

Victor, S. E., & Klonsky, E. D. (2016). Validation of a Brief Version of the Difficulties in Emotion Regulation Scale (DERS-18) in Five Samples. *Journal of Psychopathology and Behavioral Assessment, 38*(4), 582–589. https://doi.org/10.1007/s10862-016-9547-9

Weiss, J., Riosa, P., Mazefsky, C., & Beaumont, R. (2017). Emotion regulation in autism spectrum disorder. In C. Essau, S. Leblanc, & T. Ollendick (Eds.), *Emotion Regulation and Psychopathology in Children and Adolesecents* (pp. 235–258). Oxford University Press (OUP).

Weiss, J. A., Thomson, K., & Chan, L. (2014). A systematic literature review of emotion regulation measurement in individuals with autism spectrum disorder. *Autism Research, 7*(6), 629–648. https://doi.org/10.1002/aur.1426

Wiedemann, G., Rayki, O., Feinstein, E., & Hahlweg, K. (2002). The Family Questionnaire: Development and validation of a new self-report scale for assessing expressed emotion. *Psychiatry Research, 109*(3), 265–279. https://doi.org/10.1016/S0165-1781(02)00023-9

Wilson, B. J., Berg, J. L., Zurawski, M. E., & King, K. A. (2013). Autism and externalizing behaviors: Buffering effects of parental emotion coaching. *Research in Autism Spectrum Disorders, 7*(6), 767–776. https://doi.org/10.1016/j.rasd.2013.02.005

Wood, J. J., & Gadow, K. D. (2010). Exploring the nature and function of anxiety in youth with autism spectrum disorders. *Clinical Psychology: Science and Practice*, *17*(4), 281–292. https://doi.org/10.1111/j.1468-2850.2010.01220.x

Yap, M. B. H., Allen, N. B., & Sheeber, L. (2007). Using an emotion regulation framework to understand the role of temperament and family processes in risk for adolescent depressive disorders. *Clinical Child and Family Psychology Review*, *10*(2), 180–196. https://doi.org/10.1007/s10567-006-0014-0

Zaidman-Zait, A., Mirenda, P., Duku, E., Szatmari, P., Georgiades, S., Volden, J., Zwaigenbaum, L., Vaillancourt, T., Bryson, S., Smith, I., Fombonne, E., Roberts, W., Waddell, C., & Thompson, A. (2014). Examination of bidirectional relationships between parent stress and two types of problem behavior in children with autism spectrum disorder. *Journal of Autism & Developmental Disorders*, *2014*(44), 1908–1917.

Zhou, T., & Yi, C. (2014). Parenting styles and parents' perspectives on how their own emotions affect the functioning of children with autism spectrum disorders. *Family Process*, *53*(1), 67–79. https://doi.org/10.1111/famp.12058

APPENDIX A

EMA SURVEY

1.Are you with your child right now? |**Yes/No**
2.Please rate how you are feeling right now? | **Likert Scale 1-9**
   a. Low stress...High stress | **Likert Scale 1-9**
   b. Unpleasant...Pleasant | **Likert Scale 1-9**
3.Since the last prompt, have you seen your child engage in a challenging behavior(s)? | **Yes/No**
   i. ***If yes***: please select from the following list | **Select all that apply**
   1. Physical Aggression
   2. Self-harm
   3. Throwing items/objects or damaging property
   4. Talking back
   5. Noncompliance/defiance
   6. Screaming/crying
   7. Other
      a. If other: please list
   ii. ***If yes***: please rate the intensity of each behavior |**Likert Scale 1-5**
4. ***If yes to 3*** Please rate how you were feeling during the challenging behavior?
      a. Low stress...High stress | **Likert Scale 1-9**
      b. Unpleasant...Pleasant | **Likert Scale 1-9**
5. ***If yes to 3*** How did you respond to your emotions/cope during the challenging behavior that was most upsetting to you? |**Select**
      a. Expressed my emotion by raising my voice, yelling, or stating disapproval
      b. Left the room
      c. Thought differently/or more positively about the situation
      d. Distracted myself
      e. Sought support from another adult
      f. Took deep breaths or other calming strategy (e.g., progressive muscle relaxation, meditation, etc.)
      g. Helped or distracted the child
      h. Held in my emotion/did not to show it
      i. Other |**Open ended**
6. Is there anything else you think we should know about since the last prompt?

APPENDIX B

TABLES AND FIGURES

Table A.1: Demographics

Variable		*n*	%
Child Gender	female	22	23.39
	male	68	73.9
	non-binary	1	1.1
	missing	1	1.1
Parent Gender	female	81	88.0
	male	4	4.3
	non-binary	2	2.1
	missing	5	5.4
Parent Race	White	54	58.7
	Black or African-American	21	22.8
	Hispanic or Latino	6	6.45
	American Indian	1	1.1
	Asian or Pacific Islander	3	3.2
	Other	2	2.1
	missing	5	5.4
Parent Employment	employed full-time	36	39.1
	employed part-time	11	12.0
	unemployed--looking for work	7	7.6
	unemployed--not looking for work	28	30.4
	other	5	5.4
	missing	5	5.4
Parent Education	some high school	1	1.1
	high school diploma/GED	11	12.0
	some college	16	16.3
	technical certificate/associate degree	7	7.6
	bachelor's degree	25	26.1
	master's degree	26	27.2
	doctorate	4	4.3
	missing	5	5

	N	missing	*M(SD)*	Range

Parent Age	85	6	39.89(6.77)	37
Child Age	91	1	7.59(1.60)	6
Parent Responses that included Behavioral Event	909	-	9.65(7.81)	46

Table B.1

Descriptive statistics, correlations, and intraclass correlation coefficients for main variables (*N* participants= 92, *N* observations = 909)

	M	*SD*	range	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Behavior problems	1.860	.46191	2.271	(.426)	.133	.209	-.087	.030	-.009	-.053	-.036	.011	.137	-.063	.114	.066
2. Parent stress	4.751	2.446	8	.294**	(.396)	.900***	.153	.289**	.213*	.259*	.078	.051	.238*	-.170	.034	.280*
3. Lagged parent stress	3.985	2.434	8	.117**	.452***	(.433)	.092	.302**	.200	.199	.046	.018	.225*	-.080	.014	.163
4. Access to ER strategies	6.520	3.014	13	.209***	.083*	.069	1	.595***	.675***	.693***	.295**	.595***	.352	.106	.289**	.547***
5. Nonacceptance of emotion	7.300	3.588	12	.152**	.061	.052	.568***	1	.526***	.571***	.377***	.494***	.497***	-.130	.333**	.539***
6. Impulse control	5.395	2.977	10	.205***	.088**	.119**	.586***	.537***	1	.620***	.155	.488***	.397***	-.040	.386***	.526***
7. Goal-directed ER behavior	9.567	3.604	12	.126***	.078*	.129**	.693***	.517***	.482***	1	.096	.413***	.428***	.153	.233*	.456***
8. Awareness of emotion	6.286	2.763	12	.087*	-.064	-.020	.284***	.406***	.272***	.013	1	.493***	.235*	-.114	.111	.269*
9. Clarity of emotions	5.794	3.140	13	.133***	-.097**	-.039	.563***	.527***	.556***	.415***	.533***	1	.287**	.036	.113	.227*
10. Distressed parenting	2.736	.779	3.750	.011	.128***	.168***	.283***	.382***	.378***	.312***	.135***	.164***	1	-.257*	.430***	.578***
11. Supportive parenting	5.880	.581	2.800	-.046	-.077*	-.016	.204***	-.058	-.061	.263***	-.165***	.056	-.207***	1	-.136	-.248
12. Unsupportive parenting	2.157	.779	4.625	.240***	.042	.052	.217***	.397***	.470***	.151***	.218***	.164***	.445***	-.171***	1	.457
13. Expressed emotion	45.42	16.149	73	.110**	.062	.050	.277***	.116**	.232***	.156***	.219***	.009	.445***	-.110**	.317***	1

Note. Intraclass correlations (ICC) were calculated in the diagonal parentheses of the matrix; Between-person correlations are above the diagonal and the within-person correlations are below the diagonal

*p <.05, ** p < .01; *** p < .001

Table C.1

Multilevel model coefficients for Model 1 predicting child behavioral intensity

Model	Coefficient	Std. Error	Pseudo-R^2
Fixed Effect			21%
Intercept, γ_{00}	1.228	0.458	
Day in study, γ_{10}	-0.007	0.004	
Child age γ_{01}	-0.002	0.024	
Child gender, γ_{02}	-0.029	0.077	
Child ASD symptoms, γ_{03}	0.011	0.006	
Parent BAP characteristics, γ_{04}	<0.000	0.004	
Parent race, γ_{05}	0.008	0.048	
Parent education, γ_{06}	-0.028	0.028	
Usual parent stress, γ_{07}	0.024	0.029	
Momentary parent stress, γ_{20}	0.096***	0.026	
Strategies, γ_{08}	0.020	0.020	
Nonacceptance of emotion, γ_{09}	0.003	0.016	
Impulse control, γ_{010}	0.037*	0.018	
Goal-directed behavior, γ_{011}	-0.004	0.015	
Awareness, γ_{012}	-0.003	0.018	
Clarity, γ_{013}	-0.026	0.017	
Strategies x Momentary parent stress, γ_{30}	0.012**	0.004	
Nonacceptance x Momentary parent stress, γ_{40}	0.001	0.002	
Impulse control x Momentary parent stress, γ_{50}	-0.07*	0.003	
Goal-directed behavior x Momentary parent stress, γ_{60}	-0.007*	0.003	
Awareness x Momentary parent stress, γ_{70}	-0.003	0.003	
Clarity x Momentary parent stress, γ_{80}	0.002	0.003	

Random Effect	
Variance Intercept, $\sigma_0 u_0$	0.107
Residual Variance, σe_0	0.325

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

Table D.1

Multilevel model coefficients for Model 2 predicting child behavioral intensity

Model	Coefficient	Std. Error	Pseudo-R^2
Fixed Effect			21%
Intercept, γ_{00}	1.237	0.638	
Day in study, γ_{10}	-0.006	0.004	
Child age γ_{01}	-0.008	0.022	
Child gender, γ_{02}	-0.023	0.075	
Child ASD symptoms, γ_{03}	0.006	0.006	
Parent BAP characteristics, γ_{04}	<0.000	0.004	
Parent race, γ_{05}	-0.011	0.045	
Parent education, γ_{06}	-0.041	0.026	
Usual parent stress, γ_{07}	0.041	0.028	
Momentary parent stress, γ_{20}	0.141*	0.071	
Supportive Parenting, γ_{08}	0.016	0.063	
Unsupportive Parenting, γ_{09}	0.147**	0.047	
Distressed Parenting, γ_{010}	0.009	0.054	
Supportive x Momentary parent stress, γ_{30}	-0.002	0.011	
Unsupportive x Momentary parent stress, γ_{40}	0.007	0.009	
Distressed x Momentary parent stress, γ_{50}	-0.027*	0.011	
Random Effect			
Variance Intercept, $\sigma_2 u_0$	0.117		

Residual Variance, σ_{e2}	0.324		

*p < .05. **p < .01. ***p < .001

Table E.1:
Multilevel model coefficients for Model 3 predicting child behavioral intensity

Model	Coefficient	Std. Error	Pseudo-R^2
Fixed Effect			17%
Intercept, γ_{00}	1.092	0.518	
Day in study, γ_{10}	-0.005	0.004	
Child age γ_{01}	-0.016	0.025	
Child gender, γ_{02}	-0.066	0.083	
Child ASD symptoms, γ_{03}	0.008	0.006	
Parent BAP characteristics, γ_{04}	0.054	0.079	
Parent race, γ_{05}	-0.069	0.097	
Parent education, γ_{06}	-0.042	0.029	
Usual parent stress, γ_{07}	0.040	0.032	
Momentary parent stress, γ_{20}	0.105*	0.044	
Expressed emotion, γ_{08}	0.009*	0.004	
Expressed emotion x Momentary parent stress, γ_{20}	-0.001	0.001	
Random Effect			
Variance Intercept, $\sigma_2 u_0$	0.118		
Residual Variance, σ_{e2}	0.323		

*p < .05. **p < .01. ***p < .001

Table F.1
Multilevel model coefficients for Model 4 predicting child behavioral intensity

Model	Coefficient	Std. Error	Pseudo-R^2
Fixed Effect			15%

Intercept, γ_{00}	1.560	0.470
Day in study, γ_{10}	-0.003	0.004
Child age γ_{01}	-0.031	0.025
Child gender, γ_{02}	-0.030	0.084
Child ASD symptoms, γ_{03}	0.009	0.007
Parent BAP characteristics, γ_{04}	-0.001	0.003
Parent race, γ_{05}	-0.051	0.049
Parent education, γ_{06}	-0.030	0.028
Usual parent stress, γ_{07}	0.034	0.064
Momentary parent stress, γ_{20}	0.066***	0.008
Lagged usual stress, γ_{08}	0.001	0.009
Lagged momentary parent stress, γ_{30}	0.001	0.009
Lagged parent stress x Momentary parent stress, γ_{40}	0.002	0.004
Random Effect		
Variance Intercept, $\sigma_2 u_0$	0.094	
Residual Variance, σ_{e2}	0.322	

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

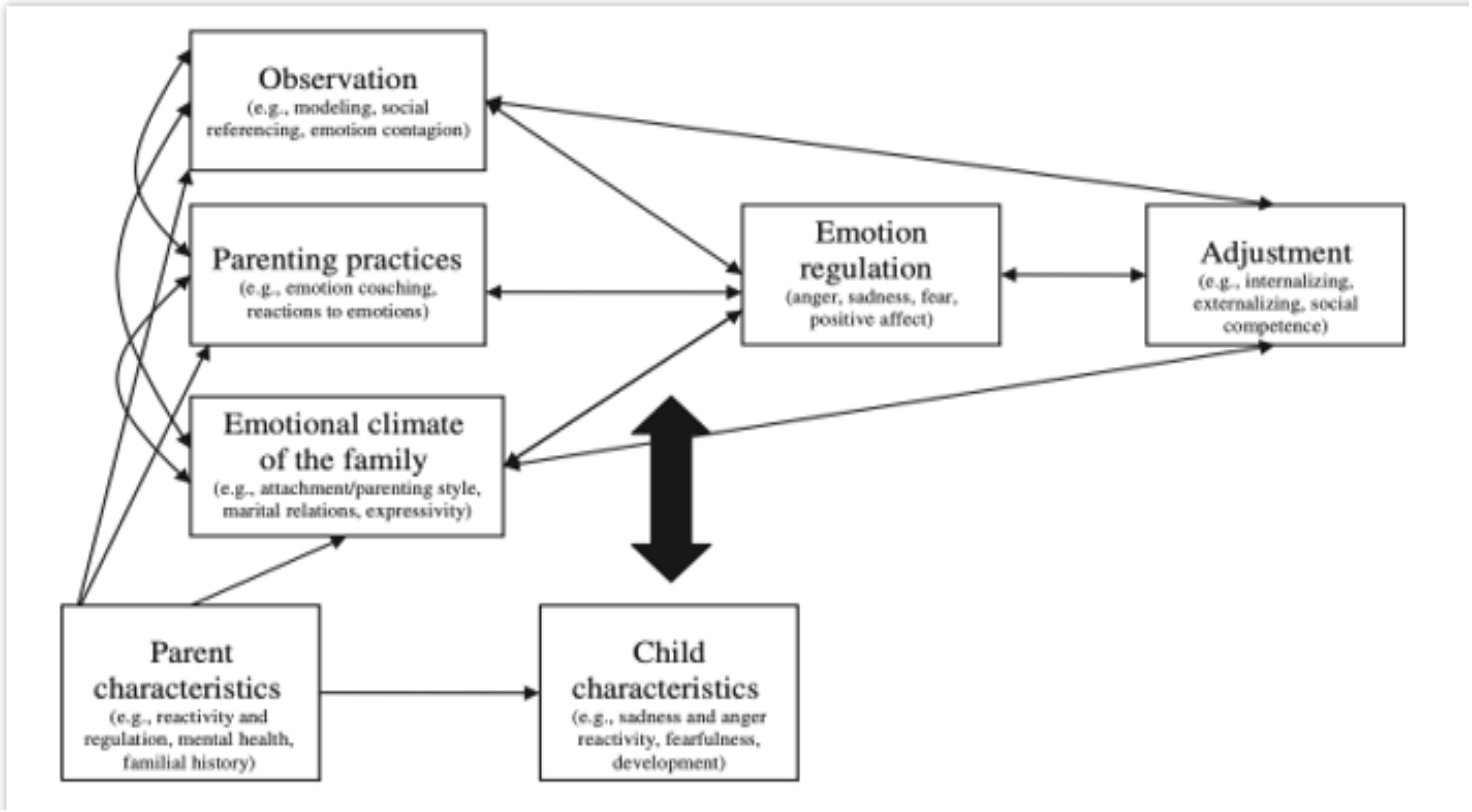

Figure A.1. Tripartite Model of the Impact of the Family on Children's Emotion Regulation and Adjustment

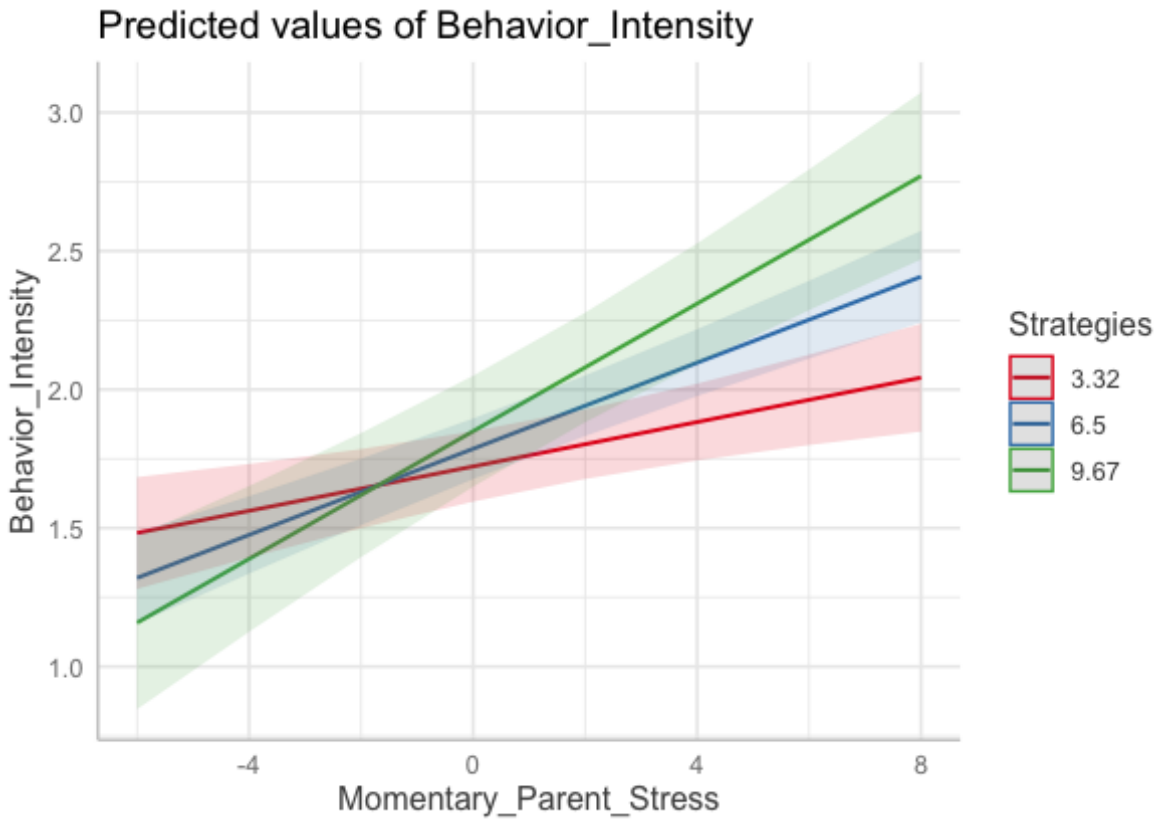

Figure B.1 Moderating effects of difficulties with emotion regulation - strategy selection

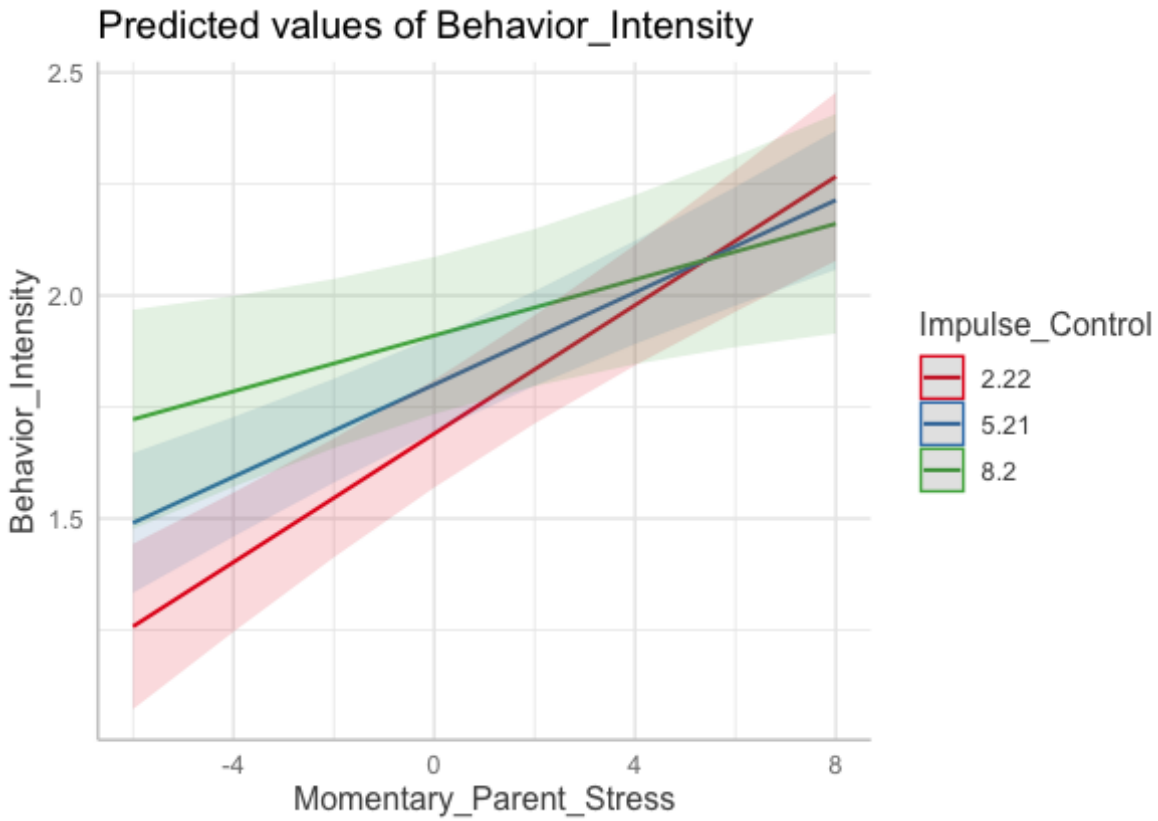

Figure C.1 Moderating effects of difficulties with emotion regulation - impulse control

Figure D.1 Moderating effects of difficulties with emotion regulation - goal directed behavior

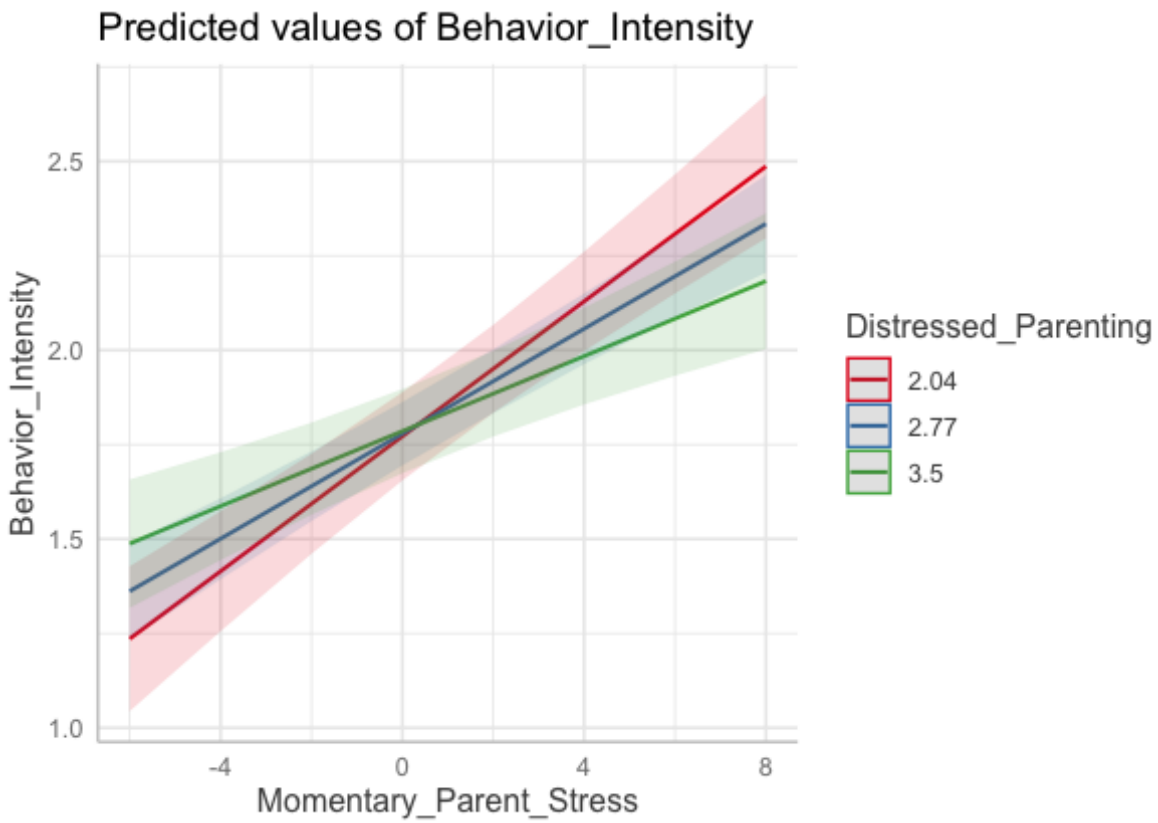

Figure E.1 Moderating effects of distressed parenting

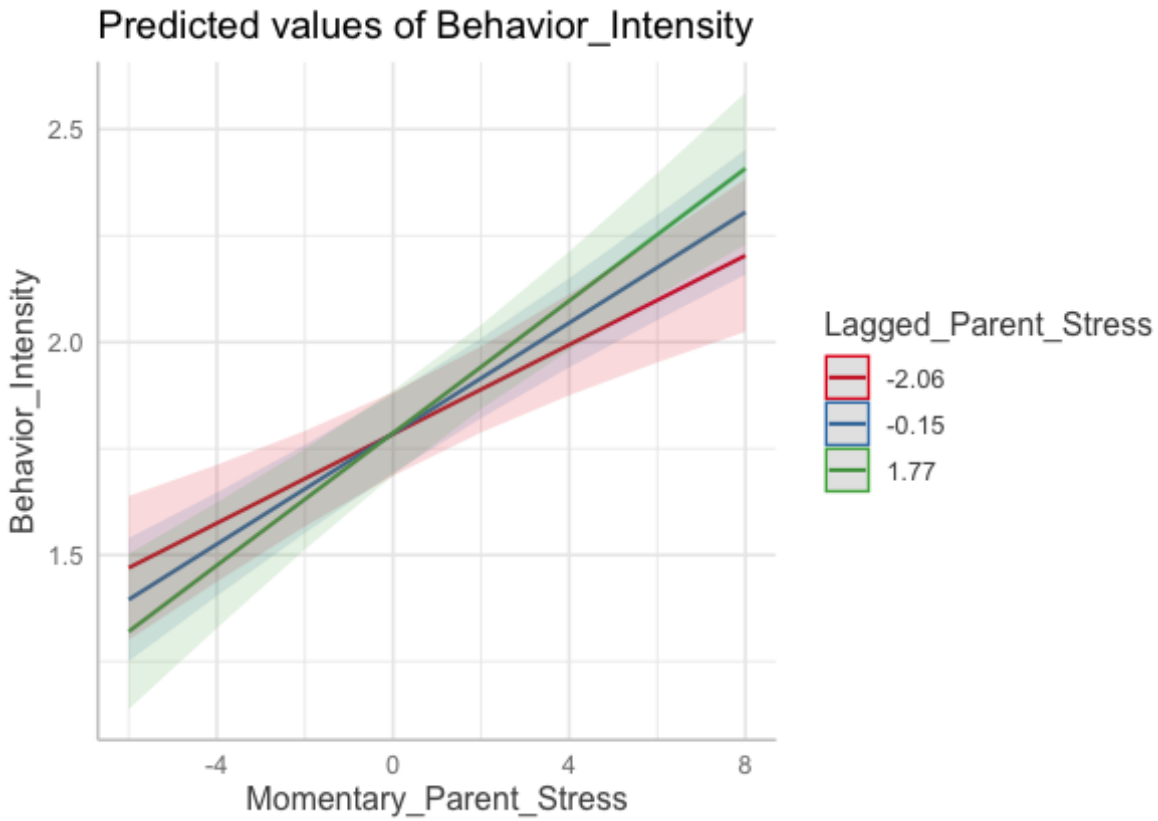

Figure F.1 Interaction of lagged parent stress and parent stress on child behavior