

PROMOTING EMOTION REGULATION IN PRESCHOOLERS WITH ASD: THE
IMPLEMENTATION OF A SYSTEMATIC TRAINING PROCEDURE

By

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ABSTRACT

PROMOTING EMOTION REGULATION IN PRESCHOOLERS WITH ASD: THE IMPLEMENTATION OF A SYSTEMATIC TRAINING PROCEDURE

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Emotion regulation (ER) is a relatively understudied area of intervention for young children with autism spectrum disorder (ASD). Parents play a significant role in the development of ER in children with and without developmental disabilities (Cole et al., 1994; Norona & Baker, 2014). Morris and colleagues (2017) reviewed a number of ER studies and found that many parental factors influence the development of ER, including parent-child relationships, positive parenting, parental affect, and parental emotional support. Many studies to date have demonstrated the effectiveness of parent-implemented interventions in the ASD population, but the influence of a systematic training procedure that teaches targeted ER strategies to parents of preschoolers with ASD has yet to be examined experimentally. There is also a gap in the existing literature examining how training procedures used to transfer evidence-based interventions to family intervention agents (such as parents) influence child ER and parent stress.

The present study examined the use of evidence-based parent training techniques as a method to train two parents to use targeted strategies to promote ER in their young children with ASD within the Regulation of Emotional Lability in Autism Through Caregiver Supports (RELACS) intervention via telehealth. A multiple-case study design was utilized in the study. Visual analysis, effect size calculations, and non-parametric analysis of individual data of parent targeted strategy use was used to assess whether a functional relationship existed between the evidence-based parent training techniques and parent strategy use in each case. While a functional relationship between the training techniques and total frequency of parent strategy use

was observed in both cases, results were variable across specific strategies within each case study. Parent ratings of child dysregulation were assessed using visual analysis and calculation of the Reliable Change Index (RCI). In both cases, parents reported a significant decline in emotional reactivity from pre- to post-intervention and pre-intervention to follow-up. Parent ratings of stress were also assessed using the Reliable Change Index. Low stress ratings were reported in both cases throughout all study phases. Intervention acceptability was also measured by analysis of the Behavior Intervention Rating Scale (BIRS; Elliot & Treuting, 1991). The intervention was reported to be acceptable by both parents, as was the telehealth-delivery aspect of the intervention. Study implications and future research directions based on these findings are provided.

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CHAPTER 1

INTRODUCTION

Problem Significance

Autism spectrum disorder (ASD) is a developmental disorder marked by the presence of restricted and/or repetitive behaviors or interests and challenges in verbal and nonverbal communication and social interactions (American Psychiatric Association, 2013). Children with ASD display greater rates of emotion dysregulation than typically developing peers (Samson et al., 2014). Maternal scaffolding and support in early childhood are crucial for the development of emotion regulation (ER) in young children with and without developmental disabilities (Norona & Baker, 2014). Further, there is evidence to suggest that higher rates of dysregulation occur when there is an absence of high-quality parental scaffolding for young children with ASD (Fenning et al., 2018). Parent use of strategies to scaffold and promote ER were also identified as a significant predictor of externalizing behavior problems in children with ASD (Ting & Weiss, 2017).

Parents of preschoolers with ASD report an eagerness to gain knowledge and learn practical strategies to support their child's specific needs (Whitaker, 2002). While there is evidence to suggest that parents can be trained to implement procedures that address challenges like problem behaviors and social communication in children with ASD (Bearss et al., 2015; McConachie & Diggle, 2007), there is a lack of research evaluating the efficacy of parent training as a means of teaching parents how to implement strategies to promote ER within this population. The success of such strategies is dependent on establishing an evidence base for the training procedure used to transfer these skills from interventionist to parent, which is why further research on this topic was warranted.

A Need for Integration of Key Training Practices

School psychologists often take on the role of disseminating knowledge and practice in evidence-based interventions to colleagues and parents. While there is growing evidence to support the efficacy of parent-mediated interventions (Trembath et al., 2019), the aim of the current study was to yield valuable information broadly pertaining to training adult learners to implement child-focused interventions with fidelity, a necessary step towards validating a new training practice. In particular, the current study explored the potential efficacy of evidence-based parent training techniques that integrate evidence-based training techniques utilized in the school psychology, applied behavior analysis, and special education literatures as a method to equip parents with the strategies they need to support skill development in young children. This knowledge can then be generalized to other parent-mediated interventions, thus expanding the scope of training practices applied across school, clinical, and community settings.

Identification and Definition of Primary Constructs

Obtaining a complete understanding of the purpose of the current study first requires thorough examination of several key concepts. First, the evidence-based parent training techniques used in the study are examined. Next, ER is examined, as the current study strove to promote the ER skills of preschool-aged children with ASD via systematic parent training. Then, the Regulation of Emotional Lability in Autism spectrum disorders through Caregiver Supports (RELACS) intervention is reviewed. Finally, parent stress is defined as a construct that was investigated in the current study.

Evidence-Based Parent Training Techniques

Evidence-based techniques utilized in the school psychology, Behavioral Skills Training (BST; Miltenberger, 2012), and Teaching Interaction Procedure (TIP; Leaf et al., 2015) literature

were used to train parents to implement targeted ER strategies with their children with ASD within the fourth session of the Regulation of Emotional Lability in Autism through Caregiver Supports (RELACS) Intervention. Techniques to foster skill transfer from interventionists to caregivers (parents, teachers) supported in the aforementioned bodies of literature include modeling, role-play, performance coaching/feedback, and demonstration of examples and nonexamples of the skill (Leaf et al, 2015; Meadan et al., 2016; Miltenberger, 2012; Sterling-Turner et al., 2002). This study aligns well with the assumptions of Behavioral Theory (Hupp et al., 2008) and Adult Learning Theory (Merriam, 2008), as the evidence-based parent training techniques are grounded in behavioral principles and address the unique needs of adult learners (such as relating learning to social roles and providing opportunities to immediately apply new knowledge). The evidence-based parent training techniques go beyond psychoeducation and instead provide a systematic means of training parents to implement strategies to promote ER in young children with ASD.

This evidence-based training approach is well-suited to the needs of adult learners and addresses the barriers to parent implementation identified by other research on this topic (i.e., time constraints and implementation accuracy) by teaching strategies that are practiced until 100% implementation accuracy is obtained in a single session (Mudford et al., 2001; Smith et al., 2000). The evidence-based parent training steps were 1) label/identify the skill(s) that will be learned in the training, 2) provide the rationale for why the participant should engage in the aforementioned skill(s), 3) break the skill(s) down into steps (i.e., a task analysis) and have the participant state each step verbally, 4) demonstrate both examples and non-examples of the skill(s), 5) prompt participant identification of examples and non-examples, 6) prompt participant role-play of the skill(s) until all steps in the task analysis are completed by the

participant with 100% accuracy, and 7) use positive reinforcement and corrective feedback with the participant throughout training (Leaf et al., 2015). A parent coaching phase was also added to this repertoire of evidence-based parent-training techniques, as there is a growing body of evidence to suggest that parent coaching can positively influence how well they are able to implement intervention strategies taught during intervention (e.g., Abouzeid et al., 2020; Meadan et al., 2016).

Emotion Regulation

Emotion regulation is the process through which one modulates and copes with positive and negative emotions and emotional reactions to meet situational needs (Thompson & Goodvin, 2007). Emotion regulation consists of internal (i.e., neurophysiological), behavioral (i.e., actions), and external/social (i.e., the behavior of others) systems operating simultaneously, which the individual must learn to manage independently in response to situational needs (Zeman et al., 2006). These processes begin in infancy and continue throughout the developmental span, with social interactions between the child and parent(s), peers, and others playing a crucial role in facilitating this process. By three years old, typically developing children are learning to rely less on other people to regulate their emotions, using increasingly sophisticated ER strategies (such as seeking the help of an adult or engaging in problem-solving), and regulating their feelings to cultivate and preserve social relations (Thompson & Goodvin, 2007).

During preschool, the strategies taught in the current study (encouragement, verbal prompting, and redirecting/distracting) can be used by parents to scaffold and facilitate the development of adaptive and increasingly independent ER skills in children. That is, parents can support preschool children by combining more basic strategies used in infancy and toddlerhood

with more sophisticated strategies that promote reflection over maladaptive physical responses. Examples of adaptive ER skills include identifying and using appropriate ER strategies in response to dysregulating scenarios and regulating emotional expression to attain desired outcomes (Izard et al., 2011). For example, parents may redirect or distract a preschool child in an attempt to modulate the child's emotional response (a strategy often used in infancy and toddlerhood) in combination with strategies appropriate for the preschool age. These include encouraging independent adaptive ER use or verbally prompting the child to use these skills during moments of dysregulation (Feldman et al., 2011; Morris et al., 2011).

Emotion Regulation and autism spectrum disorder. Children with ASD often exhibit difficulty modulating and appropriately expressing emotion (Fenning et al., 2018). Parent scaffolding and co-regulation strategies are of vital importance in this population, as they have been shown to be predictive of greater ER and lower rates of externalizing problems in children with ASD (Ting & Weiss, 2017). Complex verbal ER strategies used by parents have been linked to more positive child emotionality, but these strategies are used less by parents of children with ASD than parents of typically developing children (Hirschler-Guttenberg et al., 2014). This suggests a need for a method through which parents of children with ASD can be trained in these verbal ER strategies. Successful parent-mediated intervention is reliant on effectively training parents in delivering complex strategies such as those needed to support children's adaptive ER skill development.

This project was the first of its kind to address this critical need in the area of parent-mediated ER intervention. The three targeted parent ER strategies that were taught using the evidence-based parent training techniques were encouragement, verbal prompting, and verbal redirecting/distracting. Encouragement was defined as the parent providing positive feedback to

the child verbally, gesturally, or through facial expression. Verbal prompting was defined as the parent assisting with the child's completion of a task using either a statement or a question. Verbal redirecting/distracting was defined as the parent shifting the child's attention to a different object or activity during an emotionally dysregulating situation using a verbal statement or question. These strategies were selected because it has been found that parent use of rudimentary ER strategies from toddlerhood (i.e., redirecting and distracting) combined with higher order ER strategies that promote reflection and independent regulation (e.g., verbal prompting and encouragement) support a developmental shift towards independent ER in preschoolers (Feldman et al., 2011; Morris et al., 2011).

RELACS Intervention

The current study exposed participants to the first four sessions of the Regulation of Emotional Lability in Autism through Caregiver Supports (RELACS; Rispoli et al., in press) intervention, with the fourth session modified to include the RELACS evidence-based parent training techniques. The RELACS intervention is an in-home ER program designed for parents of preschool-aged children with autism spectrum disorder. As a parent-mediated program, a trained RELACS interventionist teaches parents how to facilitate and support ER development in the form of psychoeducation, coaching, modeling, and provision of constructive feedback over the course of weekly sessions. The RELACS interventionist is typically a master's-level or higher clinician in psychology. The author served as the interventionist for the current study, which was adapted from in-home intervention delivery to telehealth-delivery due to the COVID-19 pandemic.

Each weekly session was comprised of a different topic related to the facilitation of adaptive ER skills in young children. The first four session topics were 1) being an interactive

play partner, 2) identifying children's emotions, 3) modeling and using effective emotion regulation, and 4) using specific strategies to support emotion regulation. In the first session, the interventionist taught the parent basic concepts in ER and how to promote mutual parent-child engagement through re-arranging the home environment. During the second session, the parent was exposed to the idea of serving as their child's "emotion coach". The parent was then taught how to visually and verbally label emotions and instruct the child on emotion recognition through game-like activities. The third session of RELACS taught the parent the importance of modeling their own ER for the child and reducing the use of hostile or critical parenting behaviors. In session four, the parent learned multiple ER strategies that help support children in regulating their emotions and received instruction on when it is appropriate to ignore inappropriate displays of emotion. Pilot RELACS intervention data found variable maternal use of ER strategies (Rispoli et al., in press). Therefore, evidence-based parent training techniques were integrated into the fourth session of RELACS to enhance the training provided to parents and increase their competence in using the ER strategies through the direct instruction, modeling, and practice opportunities that the evidence-based parent training techniques provided. The final four sessions of RELACS focus on ER strategy selection and how to identify the function of emotion dysregulation. These sessions are 5) supporting ER using the Tucker Turtle technique (Lentini et al., 2016), 6) collecting data on dysregulated behavior, 7) identifying functionally appropriate ER strategies using collected behavioral data, and 8) generalizing and maintaining ER supports over time. As the primary aim of this work was to examine the influence of the evidence-based parent training techniques on parent ER strategy use within the fourth session of RELACS, the final four sessions were not included in the current study.

Parent Stress

The current study also examined whether the intervention reduced parent stress. When a person's environment presents them with tension that is significant enough to exceed their coping resources, stress occurs (Baqutayan, 2015; Lazarus, 1966). Externalizing symptoms in children have been well-linked to higher parent stress ratings (Mackler et al., 2015; Morgan et al., 2002). Research examining the influence of child disability on parent stress has revealed that parents of children with ASD report significantly higher stress levels than parents of children that are typically developing. A study examining parental and professional views on living with children with ASD found that almost ninety percent of parent participants reported high levels of stress. The same study found that forty-eight percent of these parents scored at a threshold high enough to indicate a need for further psychological assessment. In contrast, only seventeen percent of parents in the general population obtained this score (Dillenburger et al., 2010).

Elevated stress can also be attributed to many factors outside of those related to the child's disability, including financial strain, time restrictions, and a lack of social support (Smith et al., 2001). Stress can have a significant effect on family functioning and overall quality of life. A study found that parents of children with ASD rated these two variables significantly lower than parents of typically developing children (Nuske et al., 2018). The current study aimed to reduce parent stress by providing access to a service (evidence-based parent training techniques) related to supporting parents, which has been identified as a need by parents who experience stress while raising a child with ASD (Cassidy et al., 2008). Maternal ER behavior was also found to be correlated with the stress ratings of parents of children with disabilities (Smith et al., 2001).

Theoretical Basis

The current study was grounded in Behavioral Theory, Adult Learning Theory, and the Tripartite Model of Family Influence. The evidence-based training techniques focused on strengthening observable responses and phenomena through reinforcement, which are principles informed by Behavioral Theory (Hupp et al., 2008). The evidence-based parent training techniques were also in alignment with Adult Learning Theory, which posits that adult learning is a multidimensional experience that should be self-directed, problem centered, and immediately applicable (Merriam, 2008). The intervention was informed by the Tripartite Model of Family Influence, a theory that asserts ER development occurs within the context of three distinct domains: observation on behalf of the child, the practices and behavior of parents, and the family's overall emotional climate (Morris et al., 2007).

Problem Statement

Parents play a significant role in child ER development. Emotion regulation is especially challenging for children with ASD, who display higher rates of dysregulation than typically developing peers (Norona & Baker, 2014; Samson et al., 2014). In addition, parents of children with ASD report higher rates of stress than parents of children with other developmental disabilities (Valicenti-McDermott et al., 2015). There is a gap in the existing literature pertaining to the procedures used to train parents to implement strategies that promote ER development at home with their preschool-aged children with ASD. The current study aimed to examine the efficacy of evidence-based parent training techniques as a method to train parents to use targeted strategies (verbal encouragement, verbal prompting, and verbal redirecting/distracting) to promote emotion regulation in preschool-aged children with autism spectrum disorder. The influence of the current intervention on parent stress and child dysregulation was also explored.

Research Questions and Hypotheses

Research Question 1. Is there a functional relationship between delivery of evidence-based parent training techniques and parent use of verbal encouragement (H1a), verbal prompting (H1b), or verbal redirecting/distracting (H1c) to help children regulate their emotions?

Hypothesis 1a-c. It was hypothesized that the evidence-based parent training techniques would increase parent use of verbal encouragement (H1a), verbal prompting (H1b), and verbal redirecting/distracting (H1c) during a previously identified emotionally dysregulating scenario, as measured by 1) visual analysis of coded observational video data and the TauU measure of intervention effect size, and 2) visual analysis of scores obtained on the RELACS Parent Strategy Use Checklist (Gast & Ledford, 2014; Ross & Begeny, 2014).

Research Question 2. Is there a functional relationship between delivery of the evidence-based parent training techniques and parent-reported generalization of these targeted strategies to help children regulate their emotions?

Hypothesis 2. It was hypothesized that there would be a functional relationship between the evidence-based parent training techniques and parent self-reported generalization of targeted strategies to help their child regulate their emotions at home.

It was hypothesized that the evidence-based parent training techniques would increase parent-reported total frequency of ER strategy use as measured by visual analysis of scores obtained on the RELACS Parent Strategy Use Checklist (Gast & Ledford, 2014; Ross & Begeny, 2014).

Research Question 3. Does delivery of the intervention influence parent ratings of child emotion dysregulation on the Reactivity Total Score of the Emotional Dysregulation Inventory (EDI; Masefsky et al., 2018a)?

Hypothesis 3. It was hypothesized that delivery of the intervention would decrease parent ratings of child dysregulation on average from pre-intervention, post-intervention, and follow-up as measured by the Reactivity Total Score of the Emotion Dysregulation Inventory (EDI; Mazefsky et al., 2018a).

Research Question 4. Does delivery of the intervention influence parent stress as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscale scores of the Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012)?

Hypothesis 4a-c. It was hypothesized that delivery of the systematic training intervention would significantly decrease parent stress ratings from pre- to post- intervention as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscales of the PSI-4 (Abidin, 2012).

Research Question 5. Is the intervention rated as acceptable by parent participants on the Acceptability Scale of the Behavior Intervention Rating Scale (BIRS; Elliot & Treuting, 1991)?

Hypothesis 5. It was hypothesized that parent participants of the study would rate the intervention as acceptable on the Acceptability Scale of the Behavior Intervention Rating Scale.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of the research literature related to the topic of the current study. First, the theoretical framework of the study is discussed. Next, the research literature pertaining to parent-implemented intervention, web-based parent-mediated intervention and evidence-based training techniques is reviewed. Then, ER development in typically developing children and children with ASD is reviewed, along with the parent role in ER development in children with autism spectrum disorder. Next, the research literature on ER intervention is examined. Finally, stress in parents of children with ASD is discussed. This section concludes with an explanation of the current study, the design of the study, and research questions.

Theoretical Framework

Behavioral Theory

The components of the evidence-based parent training techniques in the study were grounded in Behavioral Theory, which calls for examining the relationship between behavior and the environment in a way that is separate from non-observable constructs within and across individuals (such as cognition and personality). Behavioral Theory asserts that data collected on observable behaviors can be analyzed and used to enact behavioral change. This principle aligned well with the current study, as the goal was to enact behavior change by altering aspects of the child's environment through parenting behaviors and utilized a systematic procedure designed to teach targeted ER strategies. Behavioral Theory allows for the focus of the systematic training procedure to remain on the action of the parent within the training environment instead of solely relying on measurement that cannot be directly observed, such as self-report (Hayes & Fryling, 2015).

According to the National Standards Project, a report produced by the National Autism Center (2015), parent training is a research-established practice for children and adults with ASD under 22 years of age. The techniques used to train parents in the current study (modeling, reinforcement, prompting, and role-playing) are grounded in behavioral theory and focused on teaching observable behaviors to produce behavior change. Modeling, role-playing, and performance feedback/coaching via reinforcement and prompting have been shown to increase the adoption of evidence-based practices and implementation fidelity (Alexander et al., 2015). Not only were the techniques used in the training intervention grounded in the principles of Behavioral Theory, the specific ER strategies taught to parents including verbal encouragement, verbal prompting, and verbal redirecting/distracting also aligned with the principles of Behavioral Theory and have been identified as evidence-based practices in the research literature (Odom et al., 2010).

Adult Learning Theory

The evidence-based parent training techniques ensure that behavior-environment relations remain at the forefront of parent training and implementation of targeted ER strategies. Additionally, the combination of evidence-based components is also arguably better-suited to the adult learning process than other training procedures used with adults in the current literature, such as psychoeducation and didactic training. Adult Learning Theory is the framework used to identify and explain the unique characteristics of adult learning (Knowles, 1978). Adult Learning Theory posits that adult learners learn best when they 1) self-direct their learning with an independent self-concept, 2) use accumulated life experiences as resources for learning, 3) relate learning needs to their social roles, 4) apply new knowledge immediately, and 5) are dilemma-centered and internally motivated to learn (Merriam, 2001).

The evidence-based parent training techniques were directed by the learner, centered on one dilemma, and allowed for the knowledge gained to be immediately applied (i.e., identifying examples and non-examples of situations unique to their child in which the skills could be used, the learning of a targeted ER strategy skill set, and role-play and practice to 100% accuracy), which are characteristics that were identified by Merriam (2001) as unique to adult learning. Merriam (2001) and Tough (1968) assert that adult learners also benefit from relating learning to their changing social roles, resources for learning in the form of accumulated life experience, and active involvement over instruction. The evidence-based parent training techniques fulfilled the aforementioned needs by providing the opportunity for parents to learn how to promote ER as the parent of a child with ASD, draw upon their experience with the child to determine appropriate application of the targeted strategies, and a means of learning these strategies systematically through active involvement and practice.

Tripartite Model of Family Influence

Morris and colleagues (2007) theorize that child ER is influenced by both parenting practices and the parent-child relationship (the latter of which includes parenting style and the emotional climate of the family). In young children (i.e., preschool age and under), regulating emotions and behavior is largely dependent on the assistance of the primary caregiver, making parent recognition and appropriate response to child emotional cues central to this framework (Morris et al., 2017). In addition, the procedures used to train parents in the intervention and coaching phases aligned with the three domains of this framework: child observation, parent behavior and practices, and the family emotional climate (see Figure 1 below). The RELACS intervention directly addressed the parenting behavior and practices domain of this framework by teaching parents ER strategies to use with their children. In addition, the focus of RELACS

Session 3 was how parents can model effective ER for their children to observe, which aligned with the child observation and family emotional climate domains.

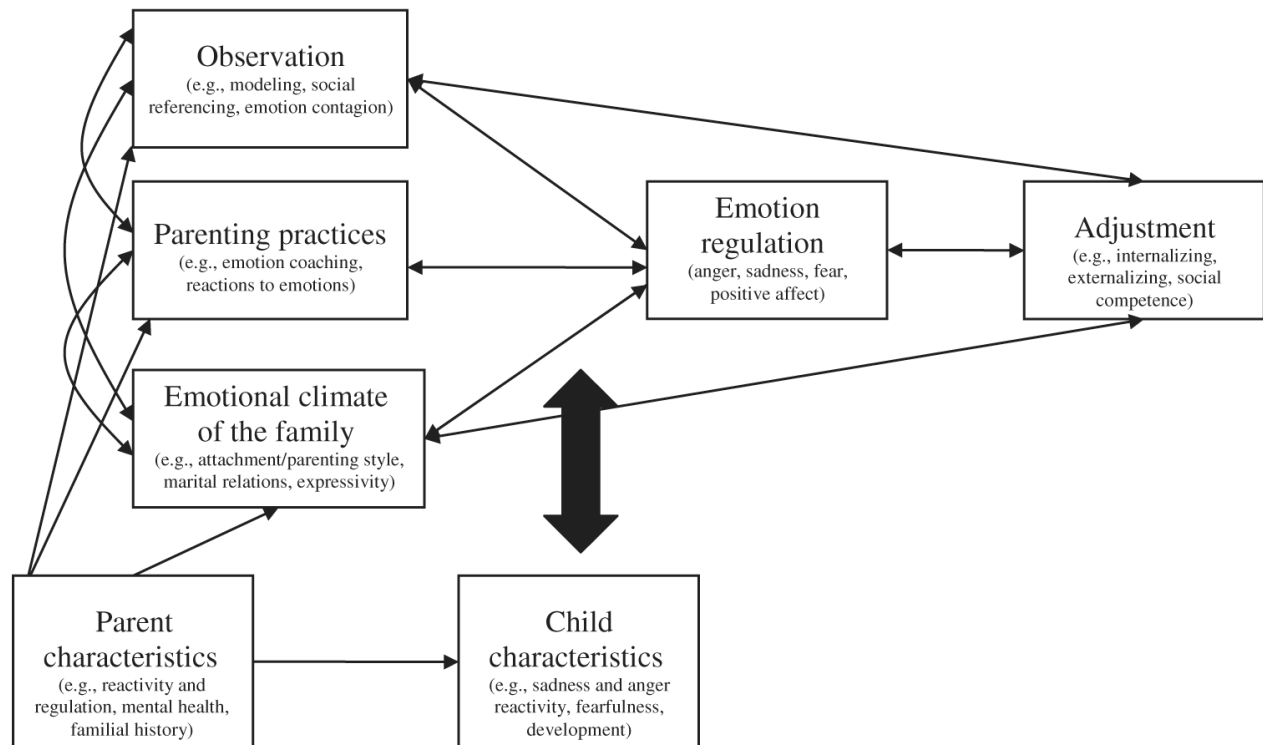


Figure 1. The Tri-Partite Model of Family Influence (Morris et al., 2007). Used with written permission from first author.

The study aimed to address the second domain of the tri-partite framework: parenting behavior and practices. By training parents to implement targeted ER strategies, the intervention promoted change in parent practices and behavior to support the ER development of their children. It was hypothesized that the intervention would increase parent strategy use and decrease parent stress. Increasing the repertoire of positive parenting practices with the introduction of targeted ER strategies may have some affect on improved parental ER behavior, which has been shown to be significantly negatively correlated with stress ratings in parents of children with disabilities (Morris et al., 2017; Smith et al., 2001).

Theory of Change

The planning, implementation, and evaluation of an intervention should be grounded in examination of the links between the intervention, outcomes, and context (Connell & Kubisch, 1998). The evidence-based parent training techniques embedded in the aforementioned theories (behavioral change, adult learning, and the Tripartite Model of parenting practices and child ER) have been categorized in terms of primary proximal, secondary proximal, and distal outcomes in a unified theory of change framework (see Figure 2 below). It was theorized that participation in evidence-based parent training techniques would result in increased parent use of strategies to support ER and decreased negative emotion-related behaviors such as criticism (primary proximal outcomes). This would then lead to increased child emotion recognition, expression, and regulation (secondary proximal outcomes), which in turn would result in distal outcomes such as decreased parent stress.

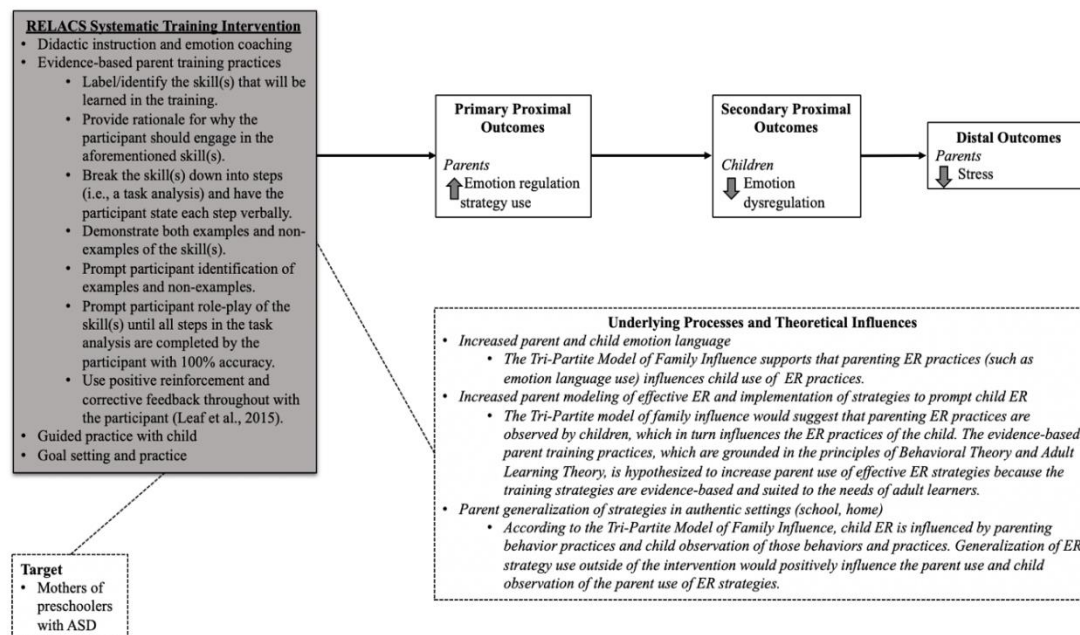


Figure 2. Theory of change framework for the current study.

Parent Implementation Intervention

Parent involvement in intervention for children with ASD has been promoted for decades (McConachie & Diggle, 2007). In addition, parent training has been identified as an established intervention in Phase II of the National Standards Project (National Autism Center, 2015). Research evidence suggests that training parents of children with ASD to implement specific intervention strategies is more effective than parent education alone. For example, in a randomized controlled trial examining the effectiveness of parent education versus parent training on reducing the disruptive behavior of 3- to 7-year old children with ASD, parent ratings on the Irritability subscale of the Aberrant Behavior Checklist (ABC-I) and Home Situations Questionnaire—Autism Spectrum Disorder (HSQ-ASD) declined significantly more in the parent training condition than ratings in the parent education condition (Bearss et al., 2015). Parent training pairs knowledge acquisition with implementation practice and feedback, thus providing opportunities for parents to apply the knowledge they have acquired in a real-life context. Additionally, a review conducted by Matson and colleagues (2009) found that parent training has been demonstrated to result in gains in a number of skills, including language, generalization of skills taught through discrete trial training, social skills, and positive relationship development in young children and adolescents with ASD, PDD-NOS, and Asperger's syndrome (Jocelyn et al., 1998; Lafakis & Sturmey, 2007; Sofronoff et al., 2004; Whittingham et al., 2009). Parent-implemented interventions were also identified as an evidence-based practice for children with ASD to reduce problem behavior and/or build a variety of child skills in a review conducted by Wong and colleagues (2015).

While some studies in early ASD parent-mediated intervention have demonstrated positive effects in one or more areas of child functioning, there are likely significant

implementation factors that may limit application of these interventions in natural settings. For example, variables such as parent implementation accuracy and lack of time to implement the intervention may have influenced results negatively. Smith and colleagues (2000) examined the effects of parent-directed intensive intervention (paired with paraprofessional in-home therapy) in a sample of six 3- to 4- year-old children with Pervasive Developmental Disorder (PDD) and found that while five of the six children acquired skills quickly at the beginning of intervention, improvements on standardized tests 2- and 3- years post-intervention were only clearly indicated for two children. It should be noted that parents and therapists were trained using a combination of lecture and performance practice throughout six 1-day training sessions spanning the course of three months but were only given critical feedback on their techniques during the last two days of training. The researchers cited relatively low treatment integrity (i.e., low parent and therapist treatment proficiency) as a potentially contributing factor to these mixed results. Mudford and colleagues (2001), Bibby and team (2002), and Fallon and colleagues (2016) cited the same limitation in their work examining in-home parent-managed early intensive behavioral intervention.

The use of evidence-based training strategies has been cited as a vital means of increasing treatment integrity in the school psychology literature (Gresham, 2009). Increasing treatment integrity is important because high treatment integrity allows for researchers and practitioners to draw sound conclusions related to treatment effectiveness (Hagermoser Sanetti et al., 2011). Implementation accuracy is a key element of treatment integrity. To obtain high treatment integrity, high implementation accuracy must be ensured. Thus, examining whether the implementation accuracy of parent-mediated interventions is influenced via the implementation of evidence-based parent training strategies was warranted. The evidence-based parent training

techniques in the current study taught parents how to implement each ER strategy correctly and increase their ER strategy use, which was hypothesized to boost intervention use and implementation accuracy. The evidence-based parent training techniques directly addressed one of the main three dimensions of treatment integrity: treatment adherence, or the extent to which the intervention is implemented as intended (Gresham, 2009). In the current study, treatment adherence was measured as accurate parent strategy use. Parents had to exhibit 100% accuracy in implementing the ER strategies during training, received the necessary background knowledge and skillset to support ER in several ways, and received training on not only ER strategy use, but also ER development and how to model effective emotion regulation.

Lack of time and/or inability to commit the prescribed amount of time needed to implement the intervention is another challenge to parent implementation. For example, Anan and colleagues (2008) trained 72 parents of preschoolers with ASD in early intensive behavior intervention and assessed child changes in adaptive and cognitive functioning after twelve weeks of treatment with the parent as the acting therapist. All parents were trained via a 12-hour workshop on basic behavioral principles and an additional three months of one-on-one training in their child's unique intervention plans with a therapist, during which the techniques were modeled for parents and then parents received coaching and feedback on their own performance. A limitation to this study was the significant burden placed on families in terms of time commitment (parents were expected to do 20 weekly intervention hours with their children) and eleven eligible families declined participation due to concerns regarding time commitment. The current study addresses these limitations by 1) delivering an adapted version of the RELACS intervention session in four 60- to 90-minute intervention sessions and three 60 minute coaching

sessions and 2) collaborating with each family to create weekly goals to fit their current schedule.

Telehealth-Based Parent-Mediated ASD Intervention

This section is a review of the current literature on telehealth-based, parent-mediated ASD intervention. The current study was adapted from in-person parent mediated intervention to telehealth-delivered parent mediated intervention in response to the COVID-19 pandemic.

Treatment Outcomes: Telehealth Delivery of Parent-Mediated ASD Intervention

Research exploring the effectiveness of telehealth-delivered, evidence-based teaching strategies used to train parents of children with ASD in social and emotional intervention is limited and emerging (Esposito et al., 2020). While factors including a lack of control groups and small sample sizes limit the generalizability of the findings, a systematic review of pragmatic language interventions indicated that tele-delivered interventions for parents of children with ASD can significantly improve parent knowledge and intervention fidelity ($p < .05$; Parsons et al., 2017). While these findings are promising, it should be noted that there is no current literature on telehealth-delivered ER intervention for children with ASD. The current study is the first of its kind and will add to the extant literature by providing valuable information regarding the implementation of a telehealth-delivered, parent-mediated ER intervention.

In more recent studies, preliminary evidence indicates that positive parent and child treatment outcomes can result from participation in telehealth-delivered parent-mediated intervention. Pennefeather and team (2018) completed a three-week online parent training program with 16 parents of four- to eight-year-old children with ASD. This program consisted of weekly meetings via teleconferencing with parent educators and supplemental online assignments (to be completed between meetings) to teach parents 1) ABA principles to

implement with their children and 2) Acceptance and Commitment Therapy-based parent stress-reduction strategies. The intervention was found to have a large effect (Cohen's $d > .8$; $p < .001$) on child prosocial behaviors and a medium effect (Cohen's $d > .5$; $p < .05$) on child hyperactive behaviors, parent stress, and parent knowledge of intervention techniques. Researchers have also recently piloted a 12-week parent coaching intervention conducted via telehealth with the aim of increasing communication skills in 2- to 18-year-old children through parent implementation of naturalistic teaching strategies (Ura et al., 2021). Throughout intervention, 41 parents received lessons from coaches, recorded themselves implementing the intervention techniques, and discussed written feedback on their performance with the coach. Paired t-tests revealed significant differences in total child ASD symptom level and social communication skills ($p = .000$) on the Autism Spectrum Rating Scale (ASRS; Goldstein & Naglieri, 2009).

Several single-case research designs implementing parent-mediated intervention and coaching via telehealth have also produced promising treatment outcomes for parents and their young children with ASD. Meadan and colleagues (2016) implemented a 2-phase (training followed by coaching) parent-mediated intervention designed to increase parent use of naturalistic teaching strategies to foster child communication skills with three parents of young (2-, 3-, and 4-year-old) children. Results indicated that the coaching phase was essential for increasing the frequency and quality of parent strategy use for all three parents; a substantial increase in the average rate and quality of parent strategy use was observed from the post-training to coaching phase. These positive changes in parent strategy use also correlated with increases in child communication skills. This study provides support for the current study's inclusion of coaching within the evidence-based training techniques, as it provides evidence to suggest that coaching could positively influence parent implementation of intervention strategies.

In another study, researchers used teleconferencing technology to teach three parents of school-aged children with ASD how to conduct a functional behavior assessment (FBA) and develop/implement a behavior intervention plan (BIP) with the goal of decreasing challenging behavior (Machalicek et al., 2016). Results from this study indicated that parents were able to use intervention strategies effectively (average procedural fidelity ratings were 74%, 89%, and 93%, respectively), and this strategy use successfully reduced rates of challenging behavior throughout treatment.

Telehealth Versus Other Modes of Parent-Mediated Intervention Delivery

Several studies have aimed to compare the effectiveness of telehealth to other modes of psychological service delivery, including web-based and face-to-face. In a systematic literature review of 14 studies examining outcomes in telehealth-delivered assessment and/or intervention delivered to a total of 284 individuals with ASD ranging from early childhood to adulthood, findings indicated that telehealth services rendered were 1) equal to face-to-face services in terms of outcomes and 2) superior to comparison groups such as control or web-based groups (Sutherland et al., 2018). Ingersoll and colleagues (2016) compared the outcomes and preliminary effectiveness of a web-based (self-directed, $n = 13$) versus therapist-assisted (telehealth-delivered, $n = 14$) parent-mediated intervention program called Project IMPACT, which aims to teach parents of young children with ASD to use naturalistic, developmental behavioral intervention strategies to promote social communication. Results indicated that parent gains in intervention fidelity were significantly higher in the therapist-assisted group ($p < .01$). In addition, program completion rates were significantly lower (69%) in the web-based group in comparison to the therapist-assisted group (100%; $p = .03$). Children in the therapist-assisted group exhibited significant increases on their Vineland Adaptive Behavior Scales (VABS-II)

social communication scores; this significant increase was not present in the self-directed group. A study further exploring this data set examined the relationship between parent characteristics/outcomes and intervention engagement. The researchers found that in addition to a significantly higher program completion rate, parents in the therapist-assisted group spent significantly more time interacting with the web-based program materials ($p < .001$; Ingersoll & Berger, 2015). These results suggest that coaching may maximize parent and child gains in telehealth-delivered parent-mediated intervention.

Preliminary evidence from comparison studies suggest that there are no significant differences in treatment outcomes when comparing telehealth-delivery to face-to-face delivery of parent-mediated intervention services. Hao and colleagues (2020) found no significant differences in implementation fidelity or child outcomes when they delivered a face-to-face ($n=15$) versus telehealth ($n=15$) parent-mediated intervention designed to increase social communication in young children with ASD. Further, the researchers found that the lack of in-person clinician demonstration of the intervention techniques did not affect parent fidelity outcomes. Another study compared outcome and cost data for three ABA service delivery models: in-home, clinic-based, and home-based telehealth in a sample of 94 children with ASD and/or other developmental disorders ranging from 21-84 months old with challenging behaviors (Lindgren et al., 2015). Researchers found a lack of significant differences across delivery models in terms of percent reduction of challenging behavior and parent-rated treatment acceptability, indicating that telehealth service delivery addressed treatment goals and outcomes at the same level as clinic-based or in-home treatment.

Feasibility and Acceptability of Telehealth-Delivered Parent-Mediated ASD Intervention

Emerging evidence suggests that telehealth-delivered parent mediated intervention is likely both a feasible and acceptable mode of service delivery for parents of children with ASD, and in some cases may be perceived as more feasible and acceptable than other modes of service delivery, such as self-directed web-based intervention. As a follow-up to the study of therapist-assisted versus web-based parent-mediated telehealth intervention by Ingersoll and colleagues (2016) described above, researchers used quantitative survey and qualitative interview data to explore parent perceptions of the feasibility and acceptability of both modes of treatment delivery (Pickard et al., 2016). Quantitative analyses indicated that parents in the therapist-assisted group rated the program significantly more acceptable ($p = .03$) and perceived significantly greater improvement in child social communication skills ($p = .05$) than parents in the web-based group. Qualitatively, parents in the therapist-assisted group were twice as likely to 1) spontaneously endorse program acceptability and 2) mention specific intervention techniques learned than their web-based counterparts.

Machalicek and colleagues (2016) also reported positive parent ratings of intervention acceptability and effectiveness ($M = 5.22, 4.07$ on a 6-point Likert scale, respectively) for their telehealth-delivered parent training program designed to teach parents to conduct an FBA and implement a BIP for challenging child behavior. Finally, the study conducted by Lindgren and colleagues (2015) found telehealth service delivery was rated at the same level of acceptability as in-home and clinic-based service delivery by parents. Further, telehealth delivery had the lowest family, facility, and staff costs of any model, indicating that telehealth is likely a more sustainable and financially feasible mode of treatment delivery. A need for further examination of the feasibility and appropriateness of tele-delivered parent-mediated interventions has been identified in the recent literature (Parsons et al., 2017). This study aimed to provide further data

on this topic by assessing the feasibility and acceptability of the current tele-delivered parent-mediated intervention through both qualitative and quantitative data collection.

Evidence-based Teaching Strategies

This section is a review of evidence-based teaching strategies used with adults in the school psychology, special education, and applied behavior analysis literatures. The current study's systematic training procedure utilized the components from each of the aforementioned bodies of literature that 1) satisfy the assumptions of Adult Learning Theory and 2) have a body of research evidence indicating positive treatment integrity outcomes.

Evidence-Based Training in School Psychology

In the school psychology literature, there is a growing evidence base supporting the use of direct parent and/or teacher training methods in treatment/intervention implementation. Evidence-based parent and teacher training techniques are comprised of many of these direct training methods, such as modeling, role-play, and the use of performance feedback/coaching. One of the methods used often in the field of school psychology to train educators is direct training (Fallon et al., 2018). For example, Sterling-Turner and colleagues (2002) used a multiple-baseline across participants design to compare the effects of indirect (i.e., verbal didactic) versus direct (i.e., modeling, role-play, performance feedback, and positive reinforcement) training on treatment integrity and outcomes in a sample of four teachers engaging in school consultation. Results indicated that 1) three out of four teachers were unable to implement the treatment plan with more than 50% integrity after indirect training alone and 2) there was an increase in treatment integrity evident across all four teachers after receiving direct training. Direct training has been deemed evidence-based according to What Works Clearinghouse (WWC) standards (Fallon et al., 2018). Similarly, findings from a systematic

review on the use of performance feedback specifically as a training strategy to increase treatment fidelity in educators indicated that performance feedback also met WWC criteria as an evidence-based intervention (Fallon et al., 2015). Additionally, a study on training twenty teachers to use pivotal response training with children with autism found that while only 15% of the teachers were able to meet mastery criteria for pivotal response training after workshop attendance alone, the addition of three in-classroom coaching sessions allowed for an additional 40% of the sample to meet mastery criteria (Suhreinrich, 2011).

There is also evidence in the school psychology literature to support the use of the aforementioned evidence-based strategies with parents. Designed to increase child social, emotional, and academic success through increasing parent competencies, the Incredible Years Parent Training Program's efficacy is supported by a number of randomized clinical trials conducted with varying demographic and age populations (Borden et al., 2010). Components of the Incredible Years Parent Training program that were also utilized in the current study's training intervention included the use of examples and nonexamples of skills, role play, and provision of feedback. Behavioral Parent Training (BPT) programs also utilize evidence-based techniques such as modeling, practice, and performance feedback. One such BPT program is Parent-Child Interaction Therapy (PCIT), an evidence-based program that requires clinicians to model, coach, and provide performance feedback while parents practice skills designed to increase positive parent-child interactions and child compliance (McNeil & Himbree-Kigin, 2010). Further, a meta-analytic review of parent training programs found that parent skill practice and emotional communication (i.e., the ER strategies taught in the current study) were significantly associated with larger study effects compared to training programs without these elements (Kaminski et al., 2008).

Evidence-Based Training in Special Education and Applied Behavior Analysis

Behavioral skills training. Behavioral Skills Training (BST) is a training procedure used in the fields of applied behavior analysis and special education that uses instruction, modeling, rehearsal, and feedback to train participants to emit a specific behavior or skill/skill set. BST has been used to teach children with ASD and their parents a variety of skill sets ranging from social skills to implementation of discrete-trial training (Miltenberger, 2012). For example, BST has been used to train teachers to implement discrete-trial training in the classroom, which resulted in increased percentage of correct responses and decreased disruptive behavior in student learners (Fetherston & Sturmey, 2014). Behavior Skills Training has also been shown to be effective at training parents of children with ASD how to implement a discrete-trial training procedure (Lafasakis & Sturmey, 2007). Hassan and colleagues (2018) used BST train parents of children with ASD how to use BST to support their child's social skills. When used in combination with in-situ training (i.e., practicing a skill in a natural environment), an improvement in child social skills was demonstrated and parents implemented BST with accuracy during intervention and follow-up.

The current study aimed to evaluate the efficacy of systematically training adult learners (i.e., parents) to implement strategies with preschool-aged children. Data collected by Hassan and colleagues (2018) suggested that caregiver implementation accuracy corresponded with child responding. In other words, higher implementation accuracy led to higher response rates using BST. The current study's evidence-based parent training techniques required the participant to reach 100% accuracy in implementation to reach mastery, which was not a requirement of BST. It was logical to hypothesize that the more stringent requirements for implementation accuracy in

the current study would in turn enhance caregiver implementation accuracy in real-life scenarios with their children.

Teaching interaction procedure. Teaching Interaction Procedure is comprised of the many of the same elements present in BST and the school psychology literature pertaining to evidence-based training strategies (i.e., instruction, modeling, rehearsal, feedback). However, in addition to these elements there is the requirement in TIP to 1) provide trainees with a rationale for why they should engage in the skill(s) being taught through TIP, and 2) practice the skill(s) until they reach 100% implementation accuracy. Teaching Interaction Procedure is a behavior analytic training procedure comprised of seven steps, of which the first six are sequential and the seventh is used as necessary throughout the procedure (Leaf et al., 2015; see below). First implemented by Phillips and colleagues (1971, 1974) as an element of the Achievement Place Teaching-Family model for adolescents with challenging behaviors, TIP was then further examined and found to be an effective method for teaching social skills to children with ASD in both one-on-one and group settings (Leaf et al., 2009; Leaf et al., 2010). TIP is similar to but somewhat different than other training procedures (such as BST, which incorporates instructions, modeling, rehearsal, and feedback; Miltenberger, 2012). The steps of TIP are numbered below:

1. Label/identify the skill(s) that will be learned in the training.
2. Provide rationale for why the participant should engage in the aforementioned skill(s).
3. Break the skill(s) down into steps (i.e., a task analysis) and have the participant state each step verbally.
4. Demonstrate both examples and non-examples of the skill(s).
5. Prompt participant identification of examples and non-examples.

6. Prompt participant role-play of the skill(s) until all steps in the task analysis are completed by the participant with 100% accuracy.
7. Throughout the training procedure, use positive reinforcement and corrective feedback with the participant (Leaf et al., 2015).

Though TIP has yet to be used with parents, the current literature demonstrates that TIP has been used with individuals with ASD across a wide range of ages and levels of functioning. For example, 45-minute sessions of TIP were found to be more effective at teaching social skills to children and adolescents with ASD than instruction for the same amount of time (i.e., social stories; Leaf et al., 2012). In a separate study, TIP was also found to be effective at teaching a range of social skills to four 4- to 13-year-old children with ASD, which then generalized to natural social interactions (Kassardjian et al., 2014). Teaching Interaction Procedure has also been used to teach children with varying degrees of functioning and skill level within the ASD population. Teaching Interaction Procedure has been shown to increase social skill behavior in school-aged children with ASD and low and high cognitive functioning, as well as 4- to 6-year-old children with Pervasive Developmental Disorder—Not Otherwise Specified (PDD-NOS; Leaf et al., 2010; Leaf et al., 2009; Ng et al., 2016). There is also evidence to support the efficacy of TIP when used with children with ASD in applied settings. Group-based TIP implemented with eight- to ten-year-old children with ASD led to participant acquirement and maintenance of four target social skills in the school setting (Peters et al., 2016).

To date, one study has evaluated the effects of TIP with adult learners. Green and colleagues (2019) used TIP to train three newly-hired early intensive behavioral interventionists to implement TIP to teach three preschool-aged children with ASD a targeted social skill: changing the game being played when peers exhibit signs of boredom. The results of this

nonconcurrent multiple-baseline design across participants revealed that TIP was efficacious at training all three interventionists to implement TIP and the preschool participants demonstrated growth in the target social skill in response to interventionist implementation of TIP as measured by visual analysis. The current research on TIP, though limited, provides evidence in preliminary support of its use as a method for training children and adolescents with autism spectrum disorder.

Integration of Evidence-based Training Techniques

Establishing an evidence base for a systematic training procedure used to train adults was an essential step towards ensuring the successful transfer of knowledge and strategies to parents and other intervention agents, which is often a focus of school psychologists and other mental health professionals. The evidence-based training techniques utilized in the school psychology, BST, and TIP literature was used to train parents to implement targeted ER strategies with their children with ASD within the fourth session of the RELACS Intervention in the current study. In addition to alignment with the assumptions of Behavioral Theory and Adult Learning Theory, the current study's evidence-based parent training techniques went beyond basic psychoeducation and instead provided a systematic means of training parents to implement strategies to promote ER in young children with ASD. Providing an explanation as to why the skills being taught was meant to help parents facilitate their child's ER development and relate the skills taught to each parent's social role benefits adult learners (Merriam, 2001). In addition, requiring 100% implementation accuracy was meant to aid both the parent and the child, the latter of which was theorized to benefit from clear, consistent, and appropriate parenting strategies (Amato & Fowler, 2002). This requirement also addressed a limitation of the pilot

study of the RELACS intervention, as there was no implementation accuracy required for parents to meet prior to advancing to the subsequent intervention module (Rispoli et al., 2019).

This approach was well-suited to the needs of adult learners and addressed the barriers to parent implementation identified by other research on this topic (i.e., time constraints and implementation accuracy) by teaching strategies that were practiced until 100% implementation accuracy was obtained in a single session (Mudford et al., 2001; Smith et al., 2000). For example, Hassan and colleagues (2018) assert that more research is needed to fully evaluate the relationship between implementation accuracy and child performance. This limitation expands beyond the BST literature; a recent review of studies that utilize parent training programs found that researchers do not generally systematically examine parent learning of strategies through methods other than post-hoc fidelity (Garbacz et al., 2014). Further, only 8% of the studies reviewed demonstrated adherence to fidelity strategies equal to or above 80% (Garbacz et al., 2014). By evaluating caregiver implementation weekly, requiring 100% fidelity of implementation, and simultaneously measuring child outcomes, the current study provided more data through which this relationship can be explored.

Emotion Regulation Development

Learning to regulate responses to scenarios which elicit strong positive or negative emotions is essential for adaptive and social functioning (Denham, 2006; Kopp, 1989;). Research suggests that the way parents interact with their children both in general and during moments of child dysregulation can significantly affect ER development. The responsivity and strategies employed by parents during the infant and toddler stages play a key role in establishing future ER patterns. In fact, it is difficult to disentangle parent actions and socialization of their children from ER development (Cole et al., 1994). Infants are largely reliant on their caregivers to

regulate their emotions (e.g., parents soothe a dysregulated infant via holding, rocking, feeding, etc.), but even at this early stage infants use emotions to signal their needs. For example, smiling or cooing during “peek-a-boo” is a signal to the caregiver that the infant would like the exchange to continue. In the following two years of life, most children will begin to experience and express fundamental emotions (happy, sad, angry, etc.), but rely on parental regulation strategies (such as physical comfort) to change emotional states (Cole et al., 1994). The strategies used by parents at this stage have been found to influence later emotion regulation. For example, maternal ER strategies (such as questioning, soothing, and providing explanations) used in toddlerhood have been positively linked to appropriate emotional responses to disappointment at 5 years old (Spinrad et al., 2004).

Episodes of dysregulation typically decrease once children reach approximately three years old. At this time, typically developing children are also able to imitate the emotions of others and curtail expressions of negative emotion under certain circumstances (Kopp, 1989). For example, a child at this age may be able to ask for a toy back calmly after another child takes it from them without asking first. Supplee and colleagues (2004) found that provision of child-directed maternal instruction (such as emotional support) during early childhood significantly predicted ER and academic outcomes upon school entry.

The preschool age marks a time of increased exposure to complex social networks, which requires increasingly independent adaptive ER in response to the demands of a given situation. Adaptive ER includes regulating emotional expression, identifying appropriate ER strategies, and using these strategies in response to dysregulating scenarios to obtain a desired outcome (Izard et al., 2011). In addition, the parent role in ER typically becomes less active (Thompson & Goodvin, 2007). Even so, emotion coaching at this stage of development is still critical to

acquiring independent ER. For example, maternal emotion coaching has been found to mediate the relationship between family risk (i.e., low socioeconomic status, family stress) and child emotional lability in preschool (Ellis et al., 2014).

To promote a developmentally appropriate shift towards self-regulation of emotion for preschool-aged children, parent strategies used in infancy and toddlerhood should be combined with strategies that decrease maladaptive responses (i.e., tantrum behavior) and instead promote child self-regulation. In the study, one ER strategy (redirecting/distracting) was often used by parents in infancy and toddlerhood, while the other two strategies (verbal encouragement and verbal prompting) were used more commonly with preschoolers to promote adaptive responding and reflection (Feldman et al., 2011; Morris et al., 2011). This scaffolded approach to promoting adaptive ER development via supportive strategies is closely connected to positive child outcomes as children age, especially in populations susceptible to ER challenges.

Emotion Regulation in ASD

Autism spectrum disorder is a developmental disorder characterized in part by challenges with social behavior. In a study examining intrinsic and extrinsic predictors of ER in children with ASD, Fenning and colleagues (2018) found that ASD symptom severity was the strongest predictor of dysregulation in a sample of 46, 4- to 11-year-old children and their parents. Many of the core symptoms of ASD interfere with effective ER development. Examples of this interference include challenges associated with deficits in theory of mind (the ability to perceive one's own mental state as well as interpret things affectively and cognitively from the perspective of other people; Schaafsma et al., 2015), the ability to explain or differentiate emotions in others as well as themselves, and difficulties with social communication and awareness that may lead to missing cues about how to appropriately express emotions in

different situations (Mazefsky & White, 2014). Even in typically developing children, social disconnectedness and withdrawal have been associated with ER that is less adaptive than those who display higher levels of social engagement (Fantuzzo, et al., 2005). Totsika and colleagues (2011) found that an estimated 70% of children with ASD experience ER challenges.

Effective ER is essential for social and behavioral success in preschool children with autism spectrum disorder. For example, in a sample of 108 young children with ASD ranging from 4- to 7-years-old, Berkovits et al., (2017) used standardized checklists and questionnaires over a two-year time period to examine how ER 1) changed over time and 2) related to overall child functioning. Findings indicated ER was highly correlated to ASD symptomology and behavioral/social functioning and that higher ER levels were a significant predictor of increased social skills and decreased externalizing behaviors a year later. In addition, Jahromi and colleagues (2013) found a link between adaptive ER and prosocial engagement with peers in a sample of 20 preschool children with high-functioning autism spectrum disorder.

Research evidence suggests that while young children with ASD and their typically developing peers are largely able to identify emotional responses in a similar way, ER is a much greater challenge for children with autism spectrum disorder. For example, typically developing preschool-aged children have been found to engage in constructive ER strategies and responses (for example, seeking social support from an adult and engaging in goal-directed behaviors) during mildly frustrating tasks significantly more than children with ASD (Jahromi et al., 2012). A study comparing 4- to 8-year-old children found that children with ASD can recognize emotions in others as well as their typically developing peers (Lacroix et al., 2014). In contrast, Jahromi and colleagues (2013) found that in a sample of 20 high-functioning preschool-aged children with ASD, self-regulation was still significantly impaired in comparison to typically

developing peers. Ros and colleagues (2018) examined parent and teacher ratings of ASD and ADHD symptoms in a sample of 40 preschoolers with externalizing problems and found that higher ASD symptoms were predictive of lower teacher ER ratings even after ADHD symptoms were accounted for. While children with ASD may have similar levels of emotional awareness at their peers, the social and communication challenges associated with ASD may make it more difficult for them to modulate their own emotional responses within different social contexts. Parent-mediated ER intervention can close this gap by providing children with ASD emotion regulation models across different contexts, as well as provide parents with strategies to promote and support adaptive ER in a number of different social situations.

Poor ER has been linked to poor social and mental health outcomes in older individuals with ASD (Mazefsky & White, 2014). In contrast, effective ER has been connected to less severe social impairment and ASD symptomology in youth with ASD (Goldsmith & Kelley, 2018). A study conducted by Pouw and team (2013) found that 63 school-aged boys with ASD reported higher levels of depression than typically developing peers, and maladaptive emotional coping strategies were a significant positive predictor of depression symptoms for this sample. These findings support the notion that supporting adaptive ER skill development could serve as a protective factor for youth with autism spectrum disorder. This finding bears particular weight when the high rates of comorbid psychiatric disorders in individuals with ASD and their associated challenges are considered. Internalizing and externalizing mental health concerns likely derive from poor/underdeveloped ER (Mazefsky & White, 2014). For example, of a sample of 112 children with ASD aged 10-14 years, seventy percent had at least one comorbid psychiatric disorder and almost half (41%) had two or more (Simonoff et al., 2008). Aligned with findings suggesting broad issues with ER in the ASD population, Mazefsky and colleagues

(2012) argue that affective research in ASD has been largely limited to investigating how individuals with ASD perceive emotions in others and must expand to encompass the examination of ER and emotional reactivity to improve treatments used to address these topics.

ER and Parents of Children with ASD

Parents play an integral role in the development of ER in children. While children with ASD have been rated as having significantly less empathetic/emotional responses to others than typically developing peers, both typically developing peers and children with ASD display the greatest number of empathetic/emotional responses to parents (Hudry & Slaughter, 2009). This finding is significant because it demonstrates that parents are uniquely suited to facilitating the regulation of their child's emotional responses as independent ER is being developed. Morris and team (2017) reviewed a number of ER studies and found that many parental factors influence the development of ER, including parent-child relationships, positive parenting, parental affect, and parental emotional support. While factors such as secure parent-child relationships, positive parental affect, and consistent emotional support have been found to increase effective ER and decrease internalizing and externalizing behaviors in children, other factors have been negatively linked to effective ER development. These negative factors include controlling and/or harsh behaviors, excessive permissiveness, and inconsistent and/or harsh discipline (Morris et al, 2017). These findings are relevant to the current study because psychoeducation was provided on the importance of engaging in fewer of the negative factors listed above while also providing the parents with training on ER strategies designed to facilitate adaptive ER and provide the child with consistent emotional support.

For parents of children with ASD specifically, parental scaffolding of ER development is especially important. In addition to child ER ability, quality of parent scaffolding (i.e., the ability

to support a child's regulation using appropriate co-regulatory techniques) has been found to be a significant independent predictor of child externalizing problems (Chan et al., 2018).

Observational and rating scale data collected on thirty-four mothers of toddlers with ASD revealed that mothers used a similar range of vocal and active ER strategies during child dysregulation as mothers of typically developing children. However, the mothers in the sample used active ER strategies more frequently than vocal strategies, whereas mothers of typically developing toddlers at this developmental stage often shift to using more vocal than active strategies, which promote child self-regulation (Grolnick et al., 1998; Gulsrud et al., 2010). These findings suggested that parents of children with ASD may benefit from the training provided by the current study, as it emphasized a scaffolded approach to ER development in which parents were systematically taught verbal ER strategies that promoted child self-regulation (verbal redirecting/distracting, verbal prompting, and verbal encouragement) to add to their existing repertoire of ER strategies.

Parents of children with ASD have also been found to use less complex verbal strategies (such as prompting and encouragement) to promote ER than parents of typically developing children. Hirschler-Guttenberg and colleagues (2014) used observational data to examine child use of ER strategies and parent ER facilitation strategies in a sample of 80 preschoolers and their parents (40 children with ASD and 40 children that did not have ASD). Observations of parent-child interactions during play and emotionally dysregulating scenarios were then coded for these variables, and findings suggested that child and parent regulatory strategies were simpler overall in the ASD group than in the non-ASD group. Further, complex verbal strategies were shown to promote parent-child reciprocity, which has in turn been linked to less negative child emotionality (Hirschler-Guttenberg et al., 2014). This pattern of simplistic ER strategy use in

preschool children with ASD in comparison to peers was also been identified by Konstantareas and Stewart (2006), whose sample included six preschool-aged children. These findings indicated a need for parent-mediated ER intervention for parents of preschool children with ASD that 1) demonstrated the importance of using complex verbal ER strategies to promote adaptive ER as their children enter the school age and 2) provided parents with the opportunity to be systematically trained to implement these strategies with fidelity, as was the goal of the current study.

Emotion Regulation Intervention

Cognitive Behavior Therapy (CBT) techniques (such as planned systematic exposure and acceptance activities) have been used to promote ER development in older children with autism spectrum disorder. For example, Thomson and colleagues (2015) utilized a multicomponent manualized CBT program designed to promote ER in a sample of 8- to 12- year old children with autism spectrum disorder. Results from this preliminary study indicated improvements in child ER as reported by parents, high parent, child, and therapist satisfaction with the intervention, and strong treatment fidelity. Similarly, Weiss and colleagues (2018) conducted a randomized waitlist-controlled trial of a 10-session ER CBT intervention with 68, 8- to 12- year old students with ASD that incorporated education, in-vivo skill practice, and reinforcement. In comparison to the control group, students in the immediate treatment group exhibited significant improvements on parent report and rating scale measures of ER and internalizing and externalizing symptoms. While these findings are promising, CBT is developmentally inappropriate for preschoolers, as their cognition and ability to self-report has often not developed to the point that would allow for full understanding and application of the skills taught in CBT (Frankel et al., 2012).

There is limited research on ER intervention focused on young children with autism spectrum disorder. Scarpa and Reyes (2011) used the combination of a modified child CBT intervention and parent psychoeducation in a clinical setting to promote ER in 11, 5- to 7-year-old children with ASD that were identified as high-functioning. After participating in the nine-week intervention (during which children and parents participated in simultaneous one-hour sessions), parents reported decreased emotional lability and negativity, increased ER, and shorter behavioral outbursts on rating scale and observational measures. In another example, Gena and colleagues (2005) utilized in vivo and video modeling with three preschool-aged participants with ASD to promote appropriate regulation of affective responding. Results indicated that both methods (in vivo and video modeling) were effective in increasing the targeted appropriate affective behaviors (appreciation, disapproval, and sympathy) in all participants. These results were obtained through 2-4 weekly 15- to 20-minute sessions over the course of several months.

While the aforementioned interventions have been shown to be somewhat successful in promoting different ER skills, it is important to note that they also require a large amount resources, personnel, and time. The current intervention aimed to address these limitations by teaching parents to implement ER strategies independently, which allowed for ER to be addressed in the home setting without professional assistance. Further limitations include response bias and a lack of researcher-collected observational data to provide further support for parent-reported data (Scarpa & Reyes, 2011; Weiss et al., 2018). The current study used a combination of observational data collected by the researcher and parent rating scale data to analyze study outcomes.

The targeted strategies that the current intervention aimed to teach parents of preschool children with ASD reflected the complex verbal parent ER strategies found to be less commonly

used by parents of this population. Promotion of sophisticated strategies such as interactive communication and cognitive appraisals may allow for parents to rely less on passive techniques such as deep breathing and decrease parent frustration caused by a lack of adaptive child ER development. A study by Nuske and colleagues (2018) found that child use of passive comforting strategies (i.e., self-soothing and deep breathing) were negatively associated with parent ratings of family functioning and quality of life. Reliance on passive approaches may be less advantageous than complex strategies because they do not incorporate the use of problem-solving strategies or identification of alternative solutions. In addition, a study examining expressed parental emotion and behavior in children and adolescents with ASD found that parental criticism, hostility, and emotional overinvolvement were all significantly negatively associated with ratings of child/adolescent externalizing behavior (Bader et al., 2015).

RELACS Intervention. The RELACS intervention is a new parent-mediated ER intervention for preschoolers with ASD. In the pilot study of RELACS, all five parents rated the intervention as acceptable, and three out of five parents reported significant increases in their emotion coaching behaviors at post-test. In the same study, four of five parents reported clinically significant reductions in stress at post-intervention (Rispoli et al., 2019). Parent level of verbal support (i.e., verbal prompting) increased from baseline to intervention for four out of five parents. Despite this level change from baseline to intervention, there was variability in parent use of strategies from one week to the next. This finding indicated promise for increasing parent ER strategy use through the RELACS intervention, but a cited need for further research including refinement of the RELACS intervention to improve potential efficacy (Rispoli et al., in press). The current study aimed to address this limitation by refining the method through which

parents were trained in ER strategy use through implementation of evidence-based parent training techniques.

Parent Stress and ASD

The degree to which parents of children with ASD experience greater stress than other parents has been well-established in the research literature. For example, Costa and colleagues (2017) assessed 37 parents of children with ASD and 40 parents of children who were typically developing ranging from 3 to 13 years old using both self-report and physiological stress measures. In comparison to parents of typically developing children in their sample, parents of children with ASD had increased levels of physiological stress and lower self-report ratings of well-being. In addition, parent perception of emotional lability and negativity in their child was a better predictor of parent well-being than having a child with an ASD diagnosis. This finding is important because it highlights the role that ASD and ER play in parent stress and demonstrates the need for further ER intervention research in this population. Reductions in parent stress have also been documented in other parent-mediated interventions for preschoolers with ASD (Diggle & McConachie, 2002; Ingersoll & Wainer, 2013; Rispoli et al., 2019).

The current intervention aimed to both reduce parent stress and address needs identified by preschool parents of children with autism spectrum disorder. In a sample of parents of 104 preschool children with ASD, 39% reported persistent stress, sleep deprivation, and strain (Cassidy et al., 2008). In this same study, a large portion of parents identified a need for further information related to coping with their child's behaviors ($n = 25$) and a desire for more services related to supporting and advising parents ($n = 20$). Preliminary findings from the RELACS pilot study provide evidence to suggest that the RELACS intervention may reduce parent stress and

give them access to services and information that improve emotion coaching behaviors (Rispoli et al., 2019).

Current Study

It is not yet known whether the implementation of a systematic training procedure, comprised of evidence-based parent training techniques, will influence parent use of targeted strategies to promote ER in young children with ASD. This study provides school psychologists and other mental health professionals with preliminary information pertaining to how adults learn and implement strategies with children when taught using a systematic training procedure. When validating any new training practice, training implementers with fidelity is a necessary component. One of the main goals of this study was to provide further information on training parents in parent-mediated intervention, which can then be generalized and used broadly across school, clinical, and community settings for a variety of services. Therefore, the conclusions drawn from the current study can be used as preliminary data in exploring whether there is support of the use of evidence-based parent training techniques.

The evidence-based parent training techniques are uniquely suited to the needs of adult learners and address the barriers to parent implementation identified by other research on this topic (i.e., time constraints and implementation accuracy) by teaching strategies that are practiced until 100% implementation accuracy is obtained in a single session. Given the positive social and behavioral correlates of effective ER skills described above and the important role played by parents in its development, the current study aimed to use evidence-based parent training techniques to teach parents specific strategies to promote ER skills in preschoolers with autism spectrum disorder. Parents were taught three targeted vocal ER strategies (verbal encouragement, verbal prompting, and verbal redirecting/distracting) to promote a

developmentally appropriate shift towards child self-regulation of emotion (i.e., verbal 3- to 5-year-olds; Grolnick et al., 1998). The study aimed to address the gap in the existing literature by examining how the evidence-based parent training techniques influenced parent use of targeted ER strategies with their preschool-aged children with autism spectrum disorder. This study also aimed to determine the intervention's influence on child dysregulation and parent stress levels. The aims and hypotheses of the current study are described in greater detail in the following section.

Research Questions

Research Question 1. Is there a functional relationship between delivery of evidence-based parent training techniques and parent use of verbal encouragement (H1a), verbal prompting (H1b), or verbal redirecting/distracting (H1c) to help children regulate their emotions?

Hypothesis 1a-c. It was hypothesized that the evidence-based parent training techniques would increase parent use of verbal encouragement (H1a), verbal prompting (H1b), and verbal redirecting/distracting (H1c) during a previously identified emotionally dysregulating scenario, as measured by 1) visual analysis of coded observational video data and the TauU measure of intervention effect size, and 2) visual analysis of scores obtained on the RELACS Parent Strategy Use Checklist (Gast & Ledford, 2014; Ross & Begeny, 2014).

Parent emotion coaching has been identified as a moderator between ASD diagnosis and emotionally-motivated externalizing behaviors, and parent-mediated intervention has been identified as an evidence-based practice for children with autism spectrum disorder (Wilson et al., 2013; Wong et al., 2015). While there is currently a gap in the research pertaining to training parents to support ER development specifically, findings from ER interventions that include parent psychoeducation and/or involvement have positive reported outcomes (Scarpa & Reyes,

2011; Weiss et al., 2018). In addition, several studies have demonstrated the effectiveness of systematic training strategies as a training procedure for children with ASD, teachers, and parents, which supported the notion that parents could be trained to use targeted strategies to support child emotion regulation (Borden et al., 2010; Green et al., 2019; Kassajardin et al., 2014; Leaf et al., 2009; Leaf et al., 2010; Leaf et al., 2012; Sterling-Turner et al., 2002).

Research Question 2. Is there a functional relationship between delivery of the evidence-based parent training techniques and parent-reported generalization of these targeted strategies to help children regulate their emotions?

Hypothesis 2. It was hypothesized that there would be a functional relationship between the evidence-based parent training techniques and parent self-reported generalization of targeted strategies to help their child regulate their emotions.

It was hypothesized that the evidence-based parent training techniques would increase parent-reported total frequency of ER strategy use as measured by visual analysis of scores obtained on the RELACS Parent Strategy Use Checklist (Gast & Ledford, 2014; Ross & Begeny, 2014). Behavior analytic systematic training techniques that employ similar training elements are effective in training parents to implement strategies with children (Hassan et al., 2018). Furthermore, research evidence suggests that parents of children with ASD are able to generalize their implementation of intervention procedures outside of training (Ingersoll & Gergans, 2006).

Research Question 3. Does delivery of the intervention influence parent ratings of child emotion dysregulation on the Reactivity Total Score of the Emotional Dysregulation Inventory (EDI; Masefsky et al., 2018a)?

Hypothesis 3. It was hypothesized that delivery of the intervention would decrease parent ratings of child dysregulation on average from pre-intervention, post-intervention, and

follow-up as measured by the Reactivity Total Score of the Emotion Dysregulation Inventory (EDI; Mazefsky et al., 2018a). There is research evidence to support the notion that exposure to ER-focused intervention decreases emotional lability, negativity, and behavioral outbursts (Rispoli et al., 2019; Scarpa & Reyes, 2011). In addition, the intervention aimed to increase maternal scaffolding and support of child ER, which contribute to the development of effective ER (Norona & Baker, 2014).

Research Question 4. Does delivery of the intervention influence parent stress as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscale scores of the Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012)?

Hypothesis 4a-c. It was hypothesized that delivery of the systematic training intervention would significantly decrease parent stress ratings from pre- to post- intervention as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscales of the Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012).

A lack of support was cited by parents of children with disabilities by Smith and team (2001) as a significant contributor to overall stress. Additionally, ER challenges are strongly linked to behavior problems, which are stressful to experience regularly as a parent of a child with ASD (Berkovits et al., 2017). The intervention aimed to provide parent participants with the support of an interventionist that would guide the parent's development as an ER facilitator for their child and their child's ability to regulate their emotions appropriately and independently. The intervention targeted and promoted child ER development, and it was hypothesized this would be reflected in the Mood subscale of the PSI-4, which measures stress due to child affective functioning (H4a). The intervention also provided parents with psychoeducation and strategies to decrease their child's emotion dysregulation, which was hypothesized to increase

the degree to which parents felt their child was able to adjust to environmental changes and decrease stress due to the child's probable difficulty with adapting to their environment (H4b). Finally, the intervention provided systematic training for parents on how to use targeted ER strategies with their children, thus increasing their sense of competence (H4c). Therefore, it was hypothesized that a significant change in parent ratings would be observed in the aforementioned subscales of the PSI-4 in the current study.

Research Question 5. Is the intervention rated as acceptable by parent participants on the Acceptability Scale of the Behavior Intervention Rating Scale (BIRS; Elliot & Treuting, 1991)?

Hypothesis 5. It was hypothesized that parent participants of the current study would rate the intervention as acceptable on the Acceptability Scale of the Behavior Intervention Rating Scale. High acceptability ratings were hypothesized/expected based on acceptability data obtained from the pilot study of the RELACS intervention. Mothers in the RELACS pilot study rated the intervention as acceptable at post-test ($M = 5.28$) and follow-up ($M = 5.05$; Rispoli et al., 2019).

CHAPTER 3

METHODS

Participants

Two parent-child dyads were recruited for the study. Initial inclusion criteria for parents included any parents who a) was a minimum of 25 years old, b) spoke English as their primary language, and c) was the biological mother of the child. Inclusion criteria for the child participants included any child who a) was between 3 to 5 years old; b) had a clinical or educational diagnosis of Autism Spectrum Disorder, as verified by researcher administration of the Autism Diagnostic Interview—Revised (ADI-R; Rutter et al., 2003); c) had a parent report four or more weekly instances of emotionally dysregulated behavior displayed by their child (see Appendix A for a screening recruitment form); and d) had a raw score of 26 or greater (Clinically Elevated) on the EDI Reactivity Scale. Emotionally dysregulated behavior included vocal and or verbal refusal, excessive screaming and/or crying, or tantrum outbursts that are more pronounced than expected given the child’s age. It did not include extreme dysregulation (i.e., self-injury, biting others), as it would have been unethical to utilize an extended baseline phase in a circumstance where the participant engaged in dangerous and/or harmful behavior (Kratowill et al., 2013; Rispoli et al., 2019).

In addition to the study inclusion listed above, adaptive assessments were used to ensure that the children had the receptive and expressive language skills necessary to benefit from the intervention. The adaptive functioning of child participants was assessed via parent completion of the Vineland Adaptive Behavior Scales—Third Edition (Vineland-3) Parent/Caregiver Form; a standard score of 80 or greater on the Communication Domain of the Vineland-3 was required for study inclusion (Saulnier, 2016). Telehealth administration of the Peabody Picture

Vocabulary Test—5th Edition (PPVT-5; Dunn, 2019) also took place as a supplemental measure of child receptive language. Mothers also completed the Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012) and Emotion Dysregulation Inventory (EDI; Mazefsky et al., 2018b) at the assessment session; this served as the “pre” standardized measurement data collection. It should be noted that eligibility testing was done remotely and that results should be interpreted with caution. See Table 1 for an overview of participant demographics and eligibility information.

Table 1:

Participant demographics

	Case Study A	Case Study B
	<i>Mother</i>	<i>Mother</i>
Age ^a (Y)	40	34
Race/Ethnicity	White	White
Marital Status	Married	Married
Education Level	Graduate Degree	High School Diploma
Family Income ^b	\$110,000	\$70,000
	<i>Child</i>	<i>Child</i>
Sex	M	M
Age (Y:M) ^a	4:0	4:11
Race/Ethnicity	White	White
Vineland-3 COM ^c	80	80
PPVT-5 Standard Score ^d	121	80
EDI Raw Score (T-Score)	32 (62.6)	27 (60.5)

^a Initial baseline assessment

^b Gross family income (per year) reported in US dollars.

^c Vineland Adaptive Behavior Scales, Third Edition (Vineland-3; Saulnier, 2016) eligibility requirement was Communication domain standard score ≥ 80

^d Peabody Picture Vocabulary Test—5th Edition (PPVT-5; Dunn, 2019)

^e Emotion Dysregulation Inventory (EDI; Mazefsky et al., 2018b) Total Score

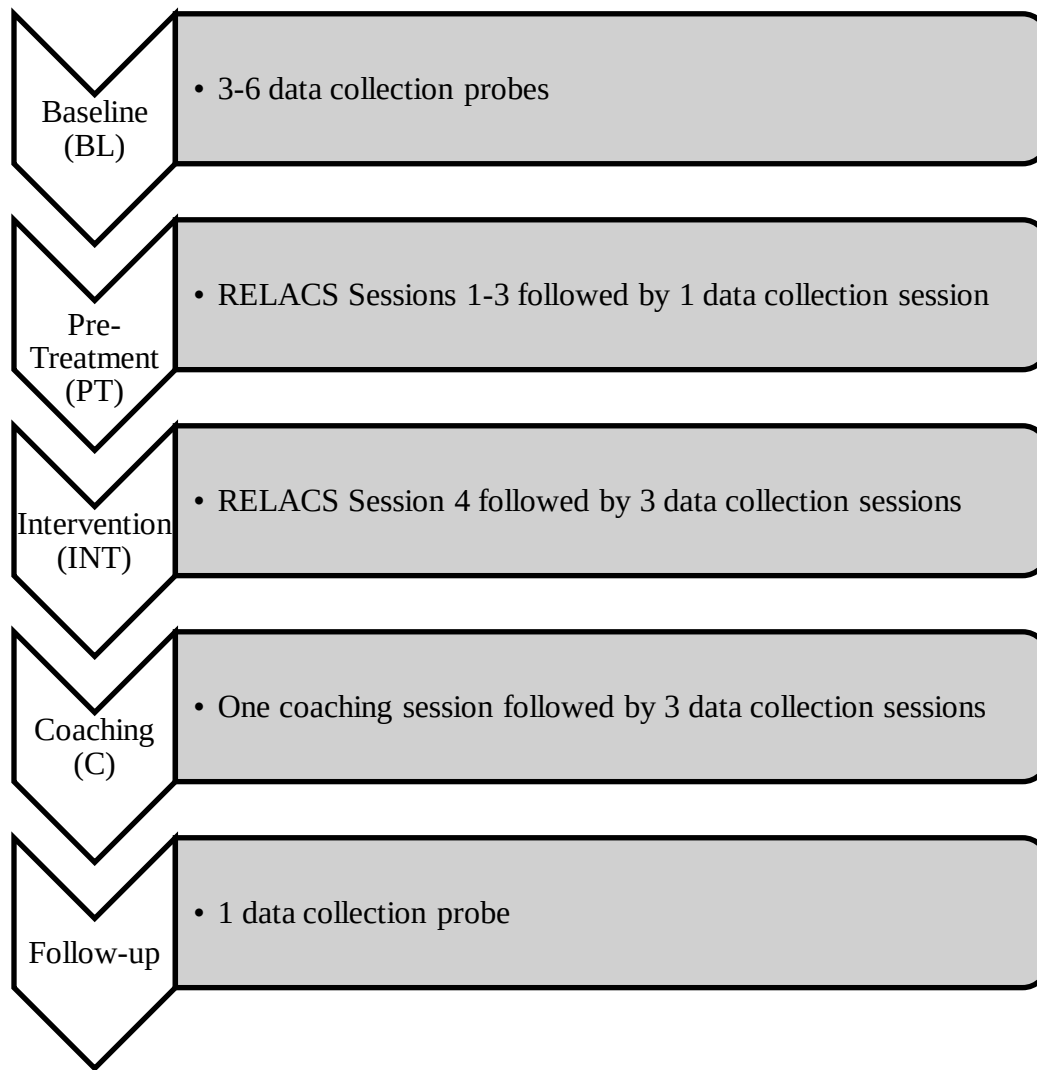


Figure 3. Observational data collection overview.

Setting

The current study was originally proposed to take place in the homes of the recruited dyads but was adapted to be delivered remotely via HIPAA-compliant Zoom to dyads in their homes due to the onset of the COVID-19 pandemic. Data collection and treatment sessions took place in a quiet room in the homes of the dyads and interventionist, respectively. Pets were not present, and the children and their siblings were either 1) in another part of the home if they were old enough to be left unsupervised or 2) remained present in the session room and given a quiet

activity to do while the interventionist and mother went through the psychoeducation component of sessions via Zoom. The child then joined the sessions for parent practice and feedback.

Materials

During the baseline, intervention, and follow-up phases, HIPAA-compliant Zoom was used to record the researcher's implementation of the intervention and the parent-child interaction during the data collection sessions. Several visual support materials were also provided to parents, including small picture cards, online handouts with a summary of topics covered during intervention sessions, online goal-setting worksheets, and online documents used during the task analysis portion of the intervention. Materials specific to the data collection sessions (which were two parent-identified emotionally dysregulating scenarios for the child, one unique to the child and one chosen by the parent from a repertoire provided by the researcher) were also utilized depending on the nature of the dysregulating scenario (e.g., if the scenario was transitioning to a non-preferred activity, materials such as a mat to work on and workbook were utilized). The parent was responsible for providing materials (if any) for the emotionally dysregulating scenario unique to the child, but the researcher provided any materials necessary for the dysregulating scenario chosen by the parent from the researcher's repertoire.

Constructs and Measures

Targeted parent strategies. Targeted parent strategy use was the primary dependent variable of the study. The evidence-based parent training techniques were used to train parents in three targeted parent strategies, which were coded during each data collection session. The three targeted parent complex verbal strategies taught using the evidence-based parent training techniques were encouragement, verbal prompting, and verbal redirecting/distracting. As discussed in the literature review, these strategies were chosen because parents of children with

ASD have been found to use less complex verbal strategies to promote ER than parents of typically developing children. Additionally, complex verbal strategies have been shown to promote parent-child reciprocity, which has been linked to less negative child emotionality in a sample of parents of preschool children with ASD (Hirschler-Guttenberg et al., 2014).

An adapted version of the Emotion-Related Behavioral Coding System (ERBCS) was used to live code these strategies. The ERBCS was developed for the RELACS Intervention pilot study, and the codes used in the study (as well as all original RELACS ERBCS codes) were adapted from codes used in other observational studies examining ER and parent-child interactions (Grolnick et al., 1998; Gulsrud et al., 2010; Hirschler-Guttenberg et al., 2015; Konstanterreas & Stewart, 2006). Any instance of behavior that fits the operational definition of each parent strategy code counted as one occurrence. Inter-rater reliability of verbal parent codes on this measure ranged from 83% to 100% in the RELACS pilot study (Rispoli et al., 2019). See the RELACS Strategy and Distress Coding Sheet (Appendix B) for the live-coding system and the Observational Coding section below for further details on the IRR for the current study.

Operational definition of encouragement. Encouragement was defined as the parent providing positive feedback to the child verbally, gesturally, or through facial expression. Examples of encouragement include the parent saying, “You are doing such a good job belly breathing to calm down!” to the child, giving the child a “high five” for finishing a task, and smiling at the child when they look in the parent’s direction during a difficult task. Non-examples include the parent saying nothing, saying “That was alright, I guess” to the child, giving the child a thumbs down after they complete a task, and frowning when the child looks in their direction during a difficult task.

Operational definition of verbal prompting. Verbal prompting was defined as the parent assisting with the child's completion of a task using either a statement or a question. Examples of verbal prompting include "What do you need to do after you put your pajamas on?", "After taking a big breath in, what comes next?", and "After you put your coat on, you need to zip it up." Non-examples of verbal prompting include "Good job eating your sandwich after drinking your milk!", "Let's stop working on tying our shoes and play for a while", and silently pointing to an object that will help the child complete the task.

Operational definition of verbal redirecting/distracting. Verbal redirecting/distracting was defined as the parent shifting the child's attention to a different object or activity during an emotionally dysregulating situation using a verbal statement or question. Examples of verbal redirecting/distracting include the parent saying, "Let's take a break and play marbles for a few minutes before we try again," saying "Johnny, let's count to ten!", and telling the child to look at a toy the parent placed on the floor. Non-examples of redirecting/distracting include the parent saying, "After you're done with this, we can play marbles", removing an object of interest from the child's grasp, physically turning the child to look at a preferred object, and completing the task for the child.

Parent strategy use. The RELACS Parent Strategy Use Checklist (Appendix C) was used as a weekly secondary measure of the current study's primary dependent variable: targeted parent strategy use. This self-report measure asked parents to indicate what, if any, RELACS intervention strategies they used throughout the previous week by checking a box next to each strategy. The checklist also asked the parent to estimate the number of intervention strategies they used per day throughout the previous week. The checklist was sent electronically to parents

once per week during baseline, intervention, and at follow-up via the Qualtrics Online Survey Tool.

Parent stress. Standardized measures were completed at recruitment (pre-), immediately following the final RELACS intervention session (post-), and at one-month follow-up. Parent stress was measured using the 120-item Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012). The PSI-4 has been used with mothers of young children with ASD in many treatment studies (Davis & Carter, 2008; Hoffman et al., 2009; Tomanik et al., 2004; Weitlauf et al., 2014). The PSI-4 has a Child Domain and a Parent Domain. The Child and Parent Domains consist of six and seven empirically validated subscales, respectively, with acceptable internal consistency. Child Domain subscales include Distractibility/Hyperactivity ($\alpha = .78$), Adaptability ($\alpha = .83$), Reinforces Parent ($\alpha = .80$), Demandingness ($\alpha = .84$), Mood ($\alpha = .79$), and Acceptability ($\alpha = .88$). The Parent Domain subscales are Competence ($\alpha = .86$), Isolation ($\alpha = .79$), Attachment ($\alpha = .86$), Health ($\alpha = .75$), Role Restriction ($\alpha = .81$), Depression ($\alpha = .87$), and Spouse/Parenting Partner Relationship ($\alpha = .86$; Abidin, 2012).

The researchers analyzed the scores obtained at pre-, post-, and follow-up from the Mood and Adaptability Subscales of the Child Domain, as well as the Competence Subscale of the Parent Domain. The Mood subscale of the Child domain measures parent perception of child affective functioning. The Adaptability subscale measures the degree to which the parent feels the child can adjust to environmental changes. The Competence subscale measures parent perception of their parental competence. These three subscales were chosen for analysis because their items most closely pertain to the variables of the study (i.e., promoting child ER, giving parents tools and strategies to decrease dysregulation, and providing systematic training on how

to use targeted ER strategies with their children) and were therefore more likely to be influenced by the intervention.

Child dysregulation. Child dysregulation was measured at pre-, post-, and follow-up using the Emotion Dysregulation Inventory (EDI; Mazefsky et al., 2018b). The EDI is a 30-item measure of emotion dysregulation that has been demonstrated to have high test-retest reliability, validity, and sensitivity to change within the ASD population. However, it should be noted that this measure has not yet been validated for the preschool age group within the ASD population, and therefore must be interpreted with caution. Factor analysis supported two factors: Reactivity (24 items) and Dysphoria (6 items). In the current study, the Reactivity total score was analyzed in accordance with developer recommendations; this factor “captures high arousal and negative valence characterized by irritability and anger” (Mazefsky et al., 2018b, p. 936). The Reactivity factor item loadings were categorized as strong or adequate by researchers (CFI=0.96, TLI=0.96, RMSEA = 0.086 [90% CI= 0.085-0.088]). In addition, the standard error for the Reactivity factor was robust (-2 to +2.5; Mazefsky et al., 2018b). Item Response Theory calibrations revealed test information curves above 10 on the theta scale for the Reactivity factor in both ASD (Mazaefsky et al, 2018b) and national (Mazaefsky et al., 2020) samples., which is roughly equivalent to reliability of .90 or above (derived from Classical Test Theory). The Dysphoria scale was not expected to be relevant in the current study. It is a measure of lower emotional arousal, not the emotion dysregulation and outbursts common among young children with ASD (Mazefsky et al., 2018b). It should also be noted that Emotion Dysregulation inventory scores were unrelated to participant Nonverbal IQ or verbal ability in a sample of children with ASD (Mazefsky et al., 2018a).

Observed child dysregulation. An adapted version of the Emotion-Related Behavioral Coding System (ERBCS) used in the RELACS intervention pilot study (Rispoli et al., in press) was also used to live code several types of child dysregulation derived from codes used in other observational studies (Grolnick et al., 1998; Gulsrud et al., 2010; Hirschler-Guttenberg et al., 2015; Konstanterreas & Stewart, 2006). To be counted as a separate occurrence of physical or verbal distress, there needed to be a 10-second window between the final occurrence of behavior meeting the operational definition and the next occurrence of behavior meeting the operational definition. As the primary dependent variable of the current study was parent ER strategy use, these codes were not used in primary study analyses nor to make phase change decisions. Child distress coding was added when the study was adapted as a multiple-case study design to enrich the dysregulation data obtained from each case study beyond questionnaire results alone.

Operational definition of physical distress. Physical distress was defined as the child throwing a tantrum, destroying/throwing objects, running around, or engaging in a physical response to signal objection or refusal to engage in the task that does not appear to signal an attempt to self-soothe, or idiosyncratic/repetitive behavior. Examples may include the child rolling around on the ground kicking and running back and forth across the room, pushing an object away, throwing an object, walking away, shaking their head “no”, or hitting/pushing the parent or researcher. Non-examples include yelling “no”, or hand-flapping repetitively or letting an object drop out of their hand. Duration coding began when the child displayed a behavior meeting the operational definition of physical distress and ended when the child no longer displayed any behaviors meeting the operational definition of physical distress. A 10-second window between the end of one occurrence of physical distress and the next occurrence of

behavior meeting the operational definition of physical distress was necessary to be counted as a separate occurrence of physical distress.

Operational definition of verbal distress. Verbal distress is defined as the child crying, screaming, or yelling without a clear purpose, or engaging in verbal behavior that appears to signal refusal to engage in the task. Verbal distress may be language-based (e.g., “no!”) or vocalizations that in context appear to indicate refusal rather than an attempt to self-soothe. Examples include saying “stop!” or “I won’t, mama”, the child emitting an unintelligible scream, or the child yelling “Mama” while crying. Non-examples include shaking their head “no” and silently flailing on the floor during a tantrum. The verbal behavior does not appear to signal an attempt to self-soothe or idiosyncratic/repetitive behavior. Duration coding began when the child displayed a behavior meeting the operational definition of verbal distress and ended when the child stopped displaying any behavior meeting the operational definition of verbal distress. To be counted as a separate occurrence of verbal distress, there had to be a 10-second window between occurrences of behaviors that met the operational definition of verbal distress. Physical and verbal distress episodes could co-occur.

Intervention feasibility and acceptability. Acceptability of the intervention was assessed at post-intervention and follow-up using an adapted version of the 24-item Behavior Intervention Rating Scale, an empirically valid measure of acceptability and effectiveness (BIRS; Elliot & Treuting, 1991). The BIRS was originally designed to measure classroom intervention acceptability and effectiveness from the perspective of the teacher. Psychometric data indicates that both the BIRS’ Total Score ($\alpha = .97$) and three factors are reliable and internally consistent: Acceptability ($\alpha = .97$), Effectiveness ($\alpha = .92$), and Time ($\alpha = .87$). The current study analyzed the BIRS’ Acceptability scores. In addition, an adapted Performance Feedback Acceptability and

Feasibility Rating form was used to measure acceptability of telehealth-delivery of the intervention (PFAFR; Machalicek, 2008). Supplemental qualitative data on parent perceptions of the feasibility and acceptability of telehealth-delivery of the RELACS intervention was also collected via Qualtrics immediately following RELACS Session 4 and again following the final coaching session (see Appendix D). See Table 2 for a data collection timeline for all study measures.

Follow-up interviews. Follow up interviews were conducted with each dyad via Zoom during the one-month follow-up appointment (See Appendix E). The purpose of this interview was to collect supplemental qualitative data on parent and child experiences from participation in the intervention, suggestions for intervention improvement, comparing this intervention to other interventions and services the family had received, and exploring when families would have liked to have learned about the RELACS intervention. This interview protocol was adapted from the protocol used in the RELACS pilot study (Rispoli et al., 2019).

Table 2:

Data Collection Timeline

Intermittent Data Collection		
<i>Pre</i>	<i>Post</i>	<i>Follow-Up</i>
EDI	EDI	EDI
PSI-4-SF	PSI-4-SF	PSI-4-SF
	BIRS	BIRS
	PFAFR	PFAFR
	Telehealth Interview	Follow-up Interview
	Weekly Data Collection	
<i>Observational Measures</i>	<i>Checklist and Rating Scale Measures</i>	
RELACS Strategy and Distress Coding Sheet	RELACS Parent Strategy Use Checklist	
RELACS Fidelity Checklist		

Study Design

The current study was originally designed as a nonconcurrent multiple probe across participants single case research design (Gast & Ledford, 2014), but was adapted due to delays and challenges in recruitment resulting from the onset of the COVID-19 pandemic. Due to these factors, the current study instead utilized a multiple-case study design (Mills et al., 2010; Yin, 2012). Multiple-case studies provide the opportunity for cross-case comparisons, notably the identification of patterns and commonalities that may provide more generalizable explanations than a single case study. The homogeneity of the cases in the current study was purposeful in that it allows for greater control for threats to internal validity, following the same principle of multiple-experiment studies (Yin, 2012). A single subject A-B design was used within each dyad (Gast & Ledford, 2014). The baseline phase for each dyad began at different points in time as eligible families were recruited for the study. For each dyad, the baseline phase continued until the primary dependent variable (parental strategy use) reached stability during the parent-identified dysregulating scenario. Once stability at the baseline phase was obtained, pre-treatment was delivered to the dyad (i.e., RELACS Sessions 1-3). One data collection probe followed pre-treatment unless a level change (i.e., an increase of 5 or more from the final baseline probe) was observed, in which case data collection probes continued until stability was obtained. After the final pre-treatment session, the intervention phase began with the evidence-based parent training techniques session, followed by three or more data collection sessions until stability was obtained in the phase. Three coaching and data collection sessions took place for each dyad after the intervention phase until phase stability was obtained. Each dyad then completed one follow-up data collection session one month after the final coaching session of the intervention phase. It should be noted that phase change decisions were made based on

frequency of strategy use across all three parent strategies; this strategy is consistent with other research examining parent-mediated interventions with parents of children with ASD (Stadnick et al., 2015). See Table 2 for participant demographic information, for a detailed study timeline, and Figure 3 for data collection overview.

Procedure

Recruitment. Participants were recruited by contacting school districts, therapy centers, and social media outlets in the greater central and southeastern regions of Michigan.

Participating sites were asked to disseminate a flyer advertising the study to families of children with ASD. Interested dyads were then recruited to participate. Prior to baseline data collection, the interventionist met with each parent for eligibility testing. First, the interventionist informed the parent of the study purpose, duration, confidentiality, incentives, and procedures, as well as any potential consequences that could occur as a result of study participation. Parents were also informed of who they could contact with questions about the study. This and all aforementioned information was also summarized in a written form for their records.

Recruitment began in October of 2020 and continued through April of 2021. During this time, a total of nine dyads expressed interest in the study. Of the nine dyads, two did not complete the screening process. The remaining seven dyads were screened and two did not qualify for the study because the child only used non-verbal forms of communication at the time of screening. The remaining five dyads underwent full eligibility testing (described above); three dyads did not qualify because the child did not have the level of verbal communication necessary to benefit from the intervention. The remaining two dyads qualified for and participated in the study.

Assessment procedure: dysregulating scenario. The researcher and parent in each dyad worked together to identify two functionally similar (i.e., likely to be influenced similarly by changes in the environment that result from treatment) emotionally dysregulating scenarios for their child; one parent-identified scenario unique to the child and one parent-identified scenario chosen from a repertoire of researcher-developed scenarios (see Appendix F). Choosing functionally similar scenarios ensured that the independent variable was likely to have a similar effect across dyads, which ensures experimental control in single subject research (Gast & Ledford, 2014). Each dyad experienced the assessment procedure in the following sequence: 1) three-minute parent-identified dysregulating scenario, 2) three-minute parent child play session, 3) three-minute researcher-developed dysregulating scenario, and 4) three-minute parent-child play session. Case Study A's parent-identified scenario was transitioning from a preferred activity (i.e., watching a video) to engage in a non-preferred activity (i.e., a preschool workbook), and the chosen researcher-developed scenario was picking up toys after a play session. Case Study B's parent-identified scenario was having to try on non-Mickey Mouse themed COVID-19 safety masks, and the chosen researcher-developed scenario was interrupting a preferred video and having to wait until the video turned back on.

The area of the home where the dysregulating scenario took place was prepped without the child in the room. For example, if the identified dysregulating scenario was the child being asked to put their winter clothes on, the parent retrieved the clothes and placed them in the area of the home where the recording occurred while another family member played with the child in a different room. The video recording began once the parent prompted the child to begin the activity (i.e., "Time to put on your winter clothes, Billy!"). These details were discussed with

each parent when the dysregulating scenario was identified, prior to the start of the baseline data sessions.

Prior to each dysregulating scenario session, the interventionist prompted each parent to support their child in the way they usually would. For example, prior to recording the interventionist would say to the mother, “Please support Billy using whatever strategies you believe will be helpful.” The interventionist live-coded parent strategy use using the RELACS Strategy and Distress Coding Sheet (see Appendix B). At the conclusion of the session, the dysregulating scenario was terminated. If the dysregulating scenario became dangerous (i.e., the child began to engage in self-injurious behavior) or the parent/child indicated that the scenario was causing too much distress, the scenario was to be discontinued immediately and the parent was referred to the MSU Psychology Clinic to seek further treatment/support. It should be noted that this did not occur for either dyad throughout the course of the study. The session concluded with a three-minute parent-child play session to ensure that the session ended with a positive parent-child interaction. It should be noted that the final play session was dropped for Case Study A so as not to cause undue emotion dysregulation given the nature of the second dysregulating scenario (Toy Pick-Up); the mother reported that getting toys back out after the child was asked to put them away would not result in a positive parent-child interaction.

Baseline. During the baseline phase, the interventionist held sessions with the dyads via Zoom once or twice per week to live code and video record the 3-minute dysregulating and play scenarios. Parents completed the EDI and PSI-4 at the eligibility testing meeting prior to the first baseline data collection session (pre-). Parents completed the RELACS Strategy Use Checklist electronically each week throughout all study phases; this measure was sent to the parent via the

Qualtrics Survey Tool on a set day and time at the end of each week that was not the day of data collection and/or intervention sessions.

Pre-treatment phase. During the pre-treatment phase, the parents received the first three sessions of the RELACS intervention before the pre-treatment data collection probe to gain the background knowledge necessary to benefit from the evidence-based parent training techniques (Rispoli et al., 2019). The first author served as the RELACS interventionist. In order to accurately examine the primary dependent variable of the study (parental ER strategy use) in Session 4, all participants were exposed to the basic principles of supporting ER skills in their children (e.g., preparing the environment, identifying children's emotions, modeling appropriate ER). For this reason, all participants experienced the first three sessions of the RELACS intervention prior to learning the ER strategies taught in Session 4. Each RELACS session lasted approximately 60 to 90 minutes once or twice per week. For a detailed description of Sessions 1-4 of the RELACS intervention, please refer to Appendix G.

RELACS session 1. Session 1 of RELACS was designed to teach parents how to be an interactive play partner. During this session, participants were taught 1) how to set their home environment up in a way that maximizes opportunities for parent-child interactions and 2) how to verbalize the actions of their child during play.

RELACS session 2. The second session of RELACS focused on how to identify and label emotions with the child. Parents were taught how to label emotions both verbally and visually (using magnets with common emotional expressions) during everyday activities, such as play, mealtime, bedtime, etc. Parents were also taught to prompt the child to label their own emotions.

RELACS session 3. The focus of RELACS Session 3 was to teach parents how to model and use effective ER skills in front of the child. Through psychoeducation, parents learned the

importance of regulating their own emotions effectively in front of the child and were taught strategies for how to model their own emotion regulation for the child using verbal descriptions of how they are feeling and explaining what they are going to do to regulate their emotions effectively. Following the RELACS pre-treatment session 3, one probe similar to baseline was conducted to evaluate where there was change in the targeted ER strategies. If a level change (i.e., an increase of 3 or more from the final baseline probe) was observed, probes continued until stability was obtained. If the data remained stable, the participant moved to the intervention phase.

Intervention phase. The purpose of this condition was to deliver the independent variable, the evidence-based parent training techniques, to the parents to train them to use the targeted ER strategies (verbal encouragement, verbal prompting, and verbal redirecting/distracting). The evidence-based parent training techniques session took place via Zoom and the session lasted approximately 60 to 90 minutes.

RELACS evidence-based teaching strategies training session. The RELACS systematic training session began with the interventionist identifying the three targeted ER strategies (verbal encouragement, verbal prompting, and verbal redirecting/distracting) to be learned during the session. Then, the interventionist provided rationale for why the parents should engage in the strategies. These strategies were then taught individually. The interventionist broke each strategy down into steps (i.e., a task analysis) and asked the parent to verbally state each step. For example, verbal prompting was broken down into three steps: identify when child needs verbal assistance, think of a way to provide that assistance using developmentally appropriate language, and then say that prompt aloud for the child. Next, the interventionist demonstrated both examples and non-examples of the strategies. After this demonstration, the interventionist

prompted the parent to identify the appropriate and non-appropriate examples the interventionist gave of each strategy. For example, the interventionist would say, “Wow, Billy! Great job trying your hardest!”, “Now that you’ve put soap on your hands, what comes next?”, “After we put our toys away, we put the lid on the toybox!” and “Why are you trying to do it that way?” After the parent identified the appropriate and non-appropriate examples, the interventionist and the parent role-played each strategy until all steps were completed by the parent with 100% accuracy. If the parent did not reach 100% accuracy within three role-play trials, the interventionist role-played the strategy to model the correct use of the strategy for the parent before the parent attempted the fourth trial. Throughout the session, the interventionist used corrective feedback and positive reinforcement (Leaf et al., 2015). For example, if a parent identified a non-appropriate example of verbal prompting as an appropriate example, the interventionist provided corrective feedback by explaining why the example was actually non-appropriate. Likewise, if a parent accurately identified an appropriate example as appropriate, the interventionist provided praise to reinforce the parent’s correct response. Immediately after the session, each dyad completed the PSI-4 and EDI measures. One week following the RELACS systematic training session, the interventionist held three data collection sessions via telehealth, during which they recorded the three-minute dysregulating scenarios and ended the session with a three-minute parent-child play interaction.

Coaching phase. Coaching sessions followed the intervention phase to support parent strategy use. At the beginning of each coaching session following the intervention session, the interventionist live-coded the same dysregulating scenarios. The interventionist then provided coaching and performance feedback to the parent. If the parent 1) did not exhibit all targeted ER strategies during the initial coding or 2) incorrectly implemented a targeted ER strategy, the interventionist provided coaching on the strategy or strategies until the parent reached 100%

implementation accuracy. The interventionist used the previously described evidence-based parent training techniques to coach the parents (e.g., task analysis, identification of examples and non-examples, feedback, positive reinforcement, etc.). The coaching sessions ended with a three-minute parent-child play session as before. The coaching phase concluded after three coaching sessions had taken place or until data stability was achieved. Immediately following the final coaching session, the parent was asked to complete the PSI-4 and the EDI measures, as well as the BIRS and APFAFR as a measure of treatment and telehealth-delivery acceptability (post-intervention).

Procedural fidelity. The RELACS fidelity checklist was used to rate the procedural fidelity of the interventionist across all RELACS sessions (see Appendix H; Rispoli et al., 2019). The fidelity checklist was modified to incorporate the steps of the evidence-based parent training techniques and coaching sessions. Each RELACS session was video recorded; a research assistant reviewed and completed a fidelity checklist for each recorded session. The research assistant was trained to measure fidelity by the interventionist. After providing examples of what each step in the fidelity checklist would look like in the videos, the interventionist and research assistant watched a recorded RELACS session together and coded fidelity independently. They then compared their checklists; once the checklists were in 100% agreement across three consecutive sessions, the research assistant continued to independently measure fidelity for the rest of the recorded RELACS session videos. Inter-rater reliability was calculated by dividing the number of checklist steps coded in agreement by the total number of checklist steps (Gast & Ledford, 2014).

Follow-up phase. Each dyad participated in one follow-up data collection session (i.e., two three-minute dysregulating scenarios and two three-minute parent-child play sessions) and a

follow-up interview one month after the last coaching session. Immediately following the observational data collection and interview, the parent was asked to complete the PSI-4-SF and the EDI measures (follow-up).

Inter-rater Reliability

The dysregulating scenarios were coded live in weekly 3-minute sessions and used to measure the primary dependent variable. Observational frequency recording of the parent strategies took place. Any instance of behavior that fit the operational definition of each parent strategy counted as one occurrence. These scenarios were video recorded, and it was originally proposed that a random selection of 30% of these scenarios would be double coded by a separate researcher for inter-rater reliability analysis from each dyad. One independent coder, blind to the hypotheses of the study, coded 30% of the three-minute parent-identified dysregulating scenario data collection sessions per dyad and recorded targeted parent strategy use via frequency recording. The coder was trained to record instances of each targeted parent strategy according to their operational definition. For a frequency count to be considered in inter-observer agreement, the time stamp for each coder's frequency count had to be within three seconds of each other. Coding competence was established once the coder reached 80% inter-coder agreement with the master coder (i.e., the researcher). Three three-minute practice tapes (from the RELACS pilot study) were used to ensure that 80% inter-observer agreement was established prior to their completion of study data coding (Popping, 1988). Percent agreement was calculated for each strategy by dividing the number of matched frequency counts by the total master coder frequency count and then multiplying by one hundred to yield a percentage (Gast & Ledford, 2014). After initial reliability was established, a randomized 30% of sessions per dyad were coded by both coders. If reliability dropped below 80% for any code, the coders met to review the session

videotape, discuss discrepancies, and immediately coded another video to reestablish consistency.

Due to low IRR after the first and second batch of reliability coding that comprised 30% of sessions (Total average IRR= 78%), the decision was made to consensus code 100% of the dysregulating scenarios and conduct analyses based on these consensus codes. The master coder and second coder met to consensus code every scenario in which one or more codes did not reach 80% or higher inter-rater reliability (28 scenarios in total). It should be noted that many of the lowest-percentage inter-rater reliability occurred when a low code frequency was observed (e.g., 0%). The consensus codes were then graphed and used for visual and TauU analyses. See Table 3 and Table 4 for Case Study A and B's inter-rater reliability percentages and consensus codes per dysregulating scenario, respectively.

Table 3:

Inter-rater reliability and consensus codes: Case Study A

Session	Scenario	Encouragement		Redirecting/Distracting		Verbal Prompting	
		% Agreement	Consensus*	% Agreement	Consensus*	% Agreement	Consensus*
BL1	Parent-Identified	100%	0	100%	0	83%	6
	Researcher-Identified	100%	0	100%	0	90%	9
BL2	Parent-Identified	100%	0	0%	1	63%	6
	Researcher-Identified	100%	0	100%	0	33%	10
BL3	Parent-Identified	100%	0	100%	2	80%	5
	Researcher-Identified	100%	0	100%	0	87%	7
PT ^a	Parent-Identified	100%	2	100%	1	81%	9
	Researcher-Identified	100%	0	100%	0	83%	5
INT1 ^a	Parent-Identified	100%	4	100%	0	91%	10
	Researcher-Identified	100%	1	0%	1	67%	9
INT2	Parent-Identified	85%	7	100%	0	80%	15
	Researcher-Identified	0%	2	100%	1	81%	13
INT3	Parent-Identified	80%	5	100%	0	64%	13
	Researcher-Identified	75%	4	0%	1	80%	13
C1	Parent-Identified	33%	3	100%	0	47%	15
	Researcher-Identified	80%	4	100%	0	33%	8
C2	Parent-Identified	100%	4	100%	0	81%	11
	Researcher-Identified	43%	7	100%	0	44%	7
C3 ^b	Parent-Identified	50%	6	100%	0	67%	9
	Researcher-Identified	75%	4	100%	2	73%	11
Follow-Up	Parent-Identified	75%	4	100%	0	88%	8
	Researcher-Identified	80%	5	100%	0	100%	11

Note. *Consensus frequency count. ^aIRR Coding Batch 1. ^bIRR Coding Batch 2.

Table 4:

Inter-rater reliability and consensus codes: Case Study B

Session	Scenario	Encouragement		Redirecting/Distracting		Verbal Prompting	
		% Agreement	Consensus*	% Agreement	Consensus*	% Agreement	Consensus*
BL1	Parent-Identified	100%	0	100%	0	67%	8
	Researcher-Identified	100%	1	100%	0	100%	1
BL2	Parent-Identified	100%	0	100%	2	31%	5
	Researcher-Identified	100%	1	100%	0	100%	0
BL3	Parent-Identified	100%	0	50%	1	26%	7
	Researcher-Identified	100%	0	100%	0	33%	3
BL4 ^a	Parent-Identified	100%	5	100%	0	0%	1
	Researcher-Identified	100%	0	100%	0	100%	0
BL5	Parent-Identified	100%	1	25%	4	23%	3
	Researcher-Identified	100%	0	100%	0	83%	5
PT ^b	Parent-Identified	100%	1	0%	2	67%	6
	Researcher-Identified	100%	0	100%	0	100%	1
INT1	Parent-Identified	100%	3	100%	2	90%	10
	Researcher-Identified	0%	1	50%	1	50%	1
INT2	Parent-Identified	100%	1	100%	3	80%	9
	Researcher-Identified	100%	0	100%	1	0%	1
INT3	Parent-Identified	100%	2	100%	2	83%	12
	Researcher-Identified	100%	0	50%	1	0%	2
C1 ^b	Parent-Identified	33%	3	0%	1	75%	8
	Researcher-Identified	50%	2	100%	0	50%	2
C2	Parent-Identified	50%	1	50%	1	73%	9
	Researcher-Identified	100%	2	100%	1	0%	1
C3	Parent-Identified	0%	1	0%	2	80%	16
	Researcher-Identified	50%	2	0%	2	28%	3
Follow-Up	Parent-Identified	100%	1	100%	4	83%	12
	Researcher-Identified	100%	0	100%	0	100%	0

Note. *Consensus frequency count. ^aIRR Coding Batch 1. ^bIRR Coding Batch 2.

Data Analysis

Research Question 1. Is there a functional relationship between delivery of evidence-based parent training techniques and parent use of verbal encouragement (H1a), verbal prompting (H1b), or verbal redirecting/distracting (H1c) to help children regulate their emotions?

Research Question 2. Is there a functional relationship between delivery of the evidence-based parent training techniques and parent-reported generalization of these targeted strategies to help children regulate their emotions?

Visual analysis was used to evaluate the effects of the evidence-based parent training techniques on targeted parent strategy use primarily as observed during video data collection sessions and secondarily as reported via the RELACS Parent Strategy Use Checklist. Level, trend, and variability of the visual data were assessed, and stable baseline data followed by a measurable change in the frequency of targeted parent strategy use indicated an intervention effect (Gast & Ledford, 2014). A second rater with a background in single case research design was used to verify the analyses.

TauU was used to estimate intervention effect size when an effect was indicated by visual analyses. TauU is currently the most statistically powerful nonoverlap index known in single-case design research as it accounts for both positive baseline trend and level change in visual analyses. TauU is a non-parametric, conservative measure of effect that accounts for a fixed amount of trendedness and yields a score from 0% to 100%. Scores of 0%-65% indicate a small effect, 66%-92% a medium to high effect, and 93% or greater a strong effect (Parker et al., 2010; Ross & Begeny, 2014). TauU was calculated first separately for each dyad. The current study used the TauU effect size calculator created by Vannest and colleagues (2016). The formula for TauU utilized in the aforementioned effect-size calculator is as follows:

$$TauU = \frac{S_p - S_A}{mn} = Tau - \frac{m - 1}{2n} t_A$$

Research Question 3. Does delivery of the intervention influence parent ratings of child emotion dysregulation on the Reactivity Total Score of the Emotional Dysregulation Inventory (EDI; Maselsky et al., 2018a)?

Standard scores obtained from the EDI at pre-, post-, and follow-up were compared descriptively within each dyad to determine whether the intervention influenced child distress in the current study (Maselsky et al., 2016). The Reliable Change Index (RCI) was used to analyze change on this measure at the individual level from pre- to post-, post- to follow-up, and pre- to follow-up (Jacobson & Truax, 1991). The RCI measures how much, if any, change has occurred from the first point of intervention (x_1) to another (x_2) while accounting for the standard error of difference (S_{diff}) between the scores. The standard error of the difference for the Reactivity subscale of the EDI is .180. An RCI score of greater than 1.96 is unlikely ($p < .05$) if real change did not take place. The formula for calculating the RCI is as follows:

$$RC = \frac{x_2 - x_1}{S_{diff}}$$

$$S_{diff} = \sqrt{2(S_E)^2}$$

Research Question 4. Does delivery of the intervention influence parent stress as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscale scores of the Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012)?

Standard scores obtained from the PSI-4-SF Total Scale at pre-, post-, and follow-up were compared descriptively within each dyad to determine whether the intervention influenced parent stress in the study (Abidin, 2012). The RCI was used to analyze change on this measure at the individual level from pre- to post-, post- to follow-up, and pre- to follow-up (Jacobson &

Truax, 1991). The standard error of the difference for the Mood (1.79), Adaptability (2.99), and Competence (3.11) subscales were used in the RCI formula.

Research Question 5. Is the intervention rated as acceptable by parent participants on the Acceptability Scale of the Behavior Intervention Rating Scale (BIRS; Elliot & Von Brock Treuting, 1991)?

Descriptive statistics from the BIRS Acceptability Scale were obtained from each parent at post-intervention and follow-up to determine intervention acceptability ratings. Mean ratings of 4 (“Slightly agree”) or higher on the BIRS Acceptability scale were the necessary criterion for the intervention to be deemed acceptable, as the developers recommend a score of 84 or higher on the BIRS (average = 3.5) to be deemed acceptable (Elliot & von Brock Treuting, 1991). This acceptability rating cut-off aligns with analyses completed for the RELACS pilot study (Rispoli et al., 2019). The RELACS pilot study participants rated the intervention as acceptable at both post-test ($M = 5.28$) and follow-up ($M = 5.05$; Rispoli et al., 2019).

CHAPTER 4

RESULTS

Environmental and Contextual Factors

The current study took place over the course of the COVID-19 pandemic, a time of documented and significant heightened stress for families (Brown et al., 2020). Both dyads in the study were personally affected by the COVID-19 pandemic. Case Study A's nanny tested positive for the virus during the intervention and Case Study B and her husband tested positive for the virus during the intervention, resulting in increased family system stress. The pandemic also resulted in study timeline delays. Converting the original in-person intervention to a telehealth-friendly version and a prolonged Institutional Review Board process resulted in recruitment beginning approximately four months later than the originally proposed timeline. Delays in recruitment also resulted in an extended period between eligibility testing and start of intervention for both dyads, as the original study design required recruitment of four dyads prior to beginning the study. Case Study A (Emma and James) began intervention approximately 4 months after completing eligibility testing, and Case Study B (Katie and Max) began intervention approximately 3 months after completing eligibility testing.

Case Study A: Emma and James

Demographic Information

Emma was a 40-year-old, Caucasian married mother of two children (James and his two-year-old sister). Emma indicated that she was employed as a librarian, completed a masters degree, and that their estimated annual family income was \$110,000. James was 4 years, 0 months old at the time of eligibility and received a diagnosis of ASD from a developmental behavioral pediatric clinic at the age of 3. In the school setting, he qualified for early childhood

special education services first under the eligibility status of speech-language impairment, then autism spectrum disorder. During the eligibility testing phase, Emma endorsed that James exhibited daily instances of emotionally dysregulated behavior including screaming/yelling, throwing or destroying toys, and hitting/kicking.

Background Information

At the start of intervention (March 2021), Emma and her husband were working remotely as a result of the COVID-19 pandemic. During work hours, James and his sister were cared for by an in-home nanny while Emma and her husband worked remotely at the home of their quarantine pod-mates (Emma's mother- and father-in-law). Emma and James participated primarily in weekly RELACS sessions, with occasional twice-weekly sessions as Emma's work schedule allowed. Between RELACS sessions 1 and 2, James' nanny tested positive for the COVID-19 virus, which resulted in increased family stress and necessitated Emma taking two weeks of leave from work to quarantine at home and care for her children. After a one-week hiatus and receiving negative COVID-19 test results, Emma and James resumed participation in the RELACS intervention. During the final week of coaching sessions, Emma returned to working in-person while James and his sister were cared for by their nanny during the work week. During the RELACS intervention, James was also receiving remote speech services through his local school district. Emma also reported making several consultation appointments with local psychological clinics to gain access to play therapy for James and/or parent management training because she found the coaching and feedback components of RELACS very helpful and wanted more behavior management services with those components. These services had not started at the time of follow-up for the current study. Finally, it should be noted that due to limited social contact outside of the household resulting from the COVID-19

pandemic, there were instances throughout all study phases where RELACS sessions were occasionally interrupted by James or his sibling entering the room, asking Emma for assistance on a task they were working on, or seeking comfort when there was a dispute during their play. These interruptions did not take place during data collection sessions, only during RELACS sessions.

Research Question 1

Is there a functional relationship between delivery of evidence-based parent training techniques and parent use of verbal encouragement (H1a), verbal prompting (H1b), or verbal redirecting/distracting (H1c) to help children regulate their emotions?

Visual analysis. The level of observed strategy use frequency was moderate during the baseline and pre-treatment phase, high during the intervention phase, and high during the coaching and follow-up phases. A change in level (from moderate to high) was observed from the baseline to intervention phase. No change in level was observed from the intervention to coaching phase. A zero celerating (neither accelerating nor decelerating, or zero trend; Gast & Ledford, 2014) trend was present in the baseline phase. A steep accelerating trend was observed in the intervention phase, and a zero celerating trend was present in the coaching phase. Across all study phases, a gradual accelerating trend was present. Data points across study phases were stable with no significant outliers present. TauU phase contrast calculations revealed a significant increase in total strategy use from baseline to intervention, baseline to coaching, and baseline to follow-up ($p = .05$). When all phase contrasts were combined into a weighted average, a significant ($p = .01$) and medium to high effect ($\text{Tau} = 69\%$) was demonstrated (see Table 5). A functional relationship was observed for total frequency of parent strategy use in Emma's case based on visual analyses and TauU calculations.

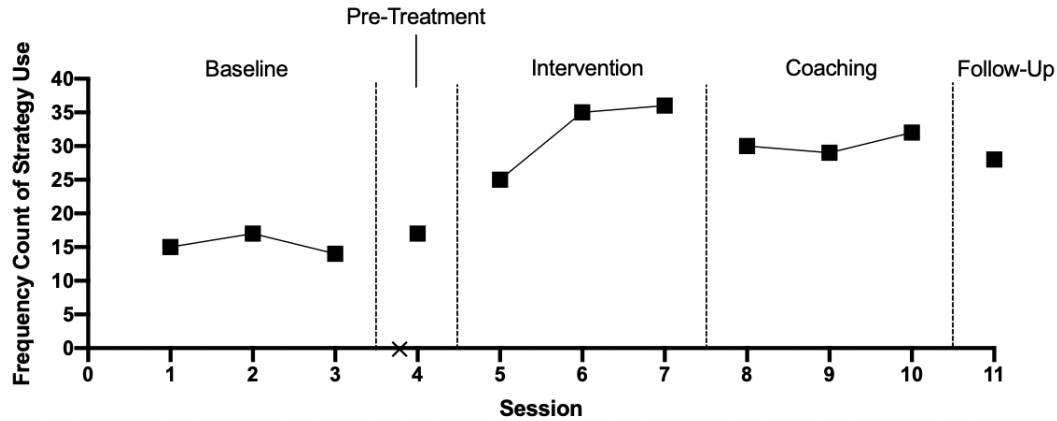


Figure 4. Total frequency of parent strategy use per data collection session for Case Study A.

The x symbol on the x-axis indicates when the one-week treatment hiatus occurred.

Table 5:

Total Frequency TauU Phase Contrasts and Weighted Average Scores for Case Study A

Phase Contrast	Tau Score (%)	<i>p</i> -value
Baseline to Pre-Treatment	67%	.37
Pre-Treatment to Intervention	100%	.18
Baseline to Intervention	100%	.05*
Baseline to Coaching	100%	.05*
Baseline to Follow-Up	100%	.18
Intervention to Coaching	-33%	.51
Weighted Average	69%	.01*

Note. * = statistically significant.

Visual analyses were also conducted to review the results of each parent strategy separately (see Figure 5). Level of verbal prompting frequency was moderate during the baseline and pre-treatment phase and moderate to high during intervention and coaching phases. Level of verbal prompting frequency remained high in the follow-up probe. A slight increase in frequency from baseline to pre-treatment was noted, but not significant enough to constitute a change in level. A change in level from baseline to intervention was observed. No change in level from the intervention to coaching phase was observed. Analysis of trend revealed a zero celerating trend in the baseline phase, a gradual accelerating trend in the intervention phase, and a gradual

decelerating trend in the coaching phase. An overall gradual accelerating trend was observed across all study phases. Data were stable across all study phases with no visible outliers. While the decelerating trend in the coaching phase does not provide unequivocal support that delivery of the evidence-based training techniques resulted in sustained behavior change, a functional relationship between delivery of the intervention and parent use of verbal prompting (H1a) was supported via TauU calculation (see Figure 5 and Table 6). A significant, strong effect (Tau = 100%, $p = .05$) was demonstrated from the baseline phase to intervention phase as well as from the baseline phase to coaching phase. A medium, significant effect on parent use of verbal prompting was also demonstrated when all phase contrasts were combined to a weighted average (Tau = 51%, $p = .05$), providing support that there was a functional relationship between delivery of the intervention and parent use of verbal prompting during dysregulating scenarios.

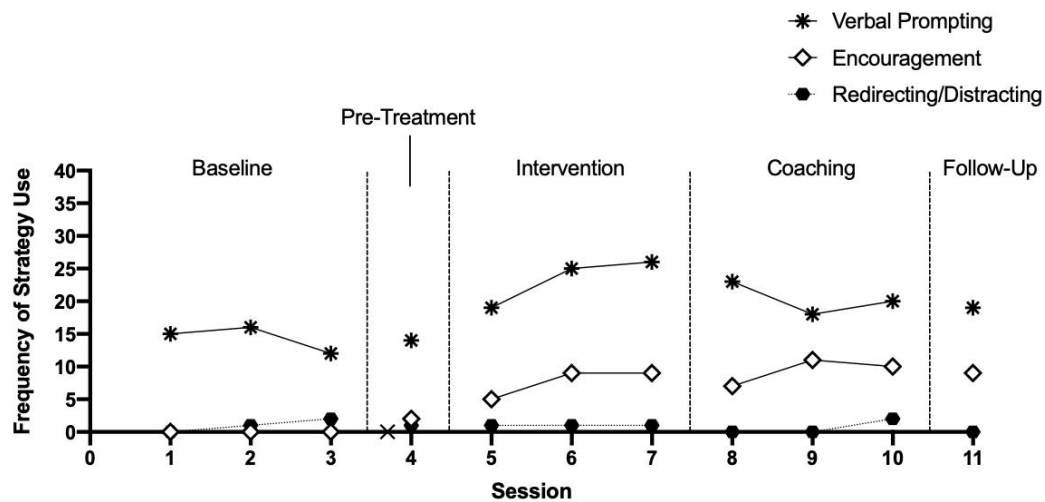


Figure 5. Frequency of verbal prompting, encouragement, and redirecting/distracting strategy use per data collection session for Case Study A.

Table 6:

Verbal Prompting TauU Phase Contrasts and Weighted Average Scores for Case Study A

Phase Contrast	Tau Score (%)	<i>p</i> -value
Baseline to Pre-Treatment	-33%	.65
Pre-Treatment to Intervention	100%	.18
Baseline to Intervention	100%	.05*
Baseline to Coaching	100%	.05*
Baseline to Follow-Up	100%	.17
Intervention to Coaching	-55%	.28
Weighted Average	51%	.05*

Note. * = statistically significant.

Encouragement frequency was at a low level during the baseline phase, low-to-moderate level during the intervention phase, and moderate level in the coaching phase and follow-up probe. A change in level was observed from the final baseline phase data point to the first intervention phase data point. No change in level was observed from the intervention to coaching phase. A zero celerating baseline phase trend, gradual accelerating intervention phase trend, and zero celerating coaching phase trend was observed. A gradual accelerating trend was observed when analyzing data across all study phases. Frequency of encouragement data points were stable across study phases, with no significant outliers. A strong, significant effect from baseline to intervention and baseline to coaching was also demonstrated for parent use of encouragement (Tau = 100%, $p = .05$). When phase contrasts were combined to calculate a weighted average, a strong and significant effect was also observed (Tau = 91%, $p = .001$). While TauU indicates a strong intervention effect, the visual analyses do not provide unequivocal support of a functional relationship between intervention delivery and parent use of encouragement (H1b; see Table 7).

Table 7:

Encouragement TauU Phase Contrasts and Weighted Average Scores for Case Study A

Phase Contrast	Tau Score (%)	<i>p</i> -value
Baseline to Pre-Treatment	100%	.18
Pre-Treatment to Intervention	100%	.18
Baseline to Intervention	100%	.05*
Baseline to Coaching	100%	.05*
Baseline to Follow-Up	100%	.18
Intervention to Coaching	56%	.28
Weighted Average	91%	.001*

Note. * = statistically significant.

Redirecting and distracting occurred at a low level across all study phases; no change in level was observed from the baseline phase to intervention phase nor the intervention phase to coaching phase. A zero celerating trend was present within and across all study phases, and data were stable with no significant outliers noted. An non-significant effect was observed from baseline to intervention (Tau = 0%, $p = 1.0$) and an non-significant negative effect was observed from baseline to coaching (Tau = -22%, $p = .66$). A small, non-significant negative effect was demonstrated when all phase contrasts were combined to form a weighted average (Tau = -20%, $p = .44$); see Table 8. The combination of visual and TauU analyses indicate that a functional relationship between intervention delivery and parent redirecting/distracting strategy use was not demonstrated for Case Study A, thus rejecting the proposed hypothesis (H1c).

Table 8:

Redirecting/Distracting TauU Phase Contrasts and Weighted Average Scores for Case Study A

Phase Contrast	Tau Score (%)	<i>p</i> -value
Baseline to Pre-Treatment	0%	1
Pre-Treatment to Intervention	0%	1
Baseline to Intervention	0%	1
Baseline to Coaching	-22%	.66
Baseline to Follow-Up	-67%	.37

Table 8 (cont'd)

Intervention to Coaching	-33%	.51
Weighted Average	-20%	.44

Note. * = *statistically significant*.

Visual analysis within individual dysregulating scenarios. In addition to analyzing the collective observational data (parent-identified and researcher-identified frustration tasks) per data collection session, visual analyses were also conducted separately for each of the two three-minute dysregulating scenarios that made up each data collection session. One scenario was identified by the parent as a task that caused consistent mild dysregulation, and the other was chosen by the parent from a repertoire of potentially mildly dysregulating scenarios presented by the researcher. For Case Study A, the parent-identified dysregulating scenario was transitioning from a preferred activity to engage in a non-preferred activity (see Figure 6). Verbal prompting occurred at a low level during the baseline phase and at a moderate level during the intervention phase, coaching phase, and follow-up probe during this scenario. A level change from the baseline phase to the intervention phase was observed, and while a slight increase in verbal prompting from the baseline phase to pre-treatment phase was noted, it was not enough of an increase to constitute a change in level. Verbal prompting frequency had a zero celerating trend during the baseline phase, gradual accelerating trend during the intervention phase, and steep decelerating trend during the coaching phase. Verbal prompting frequency data were stable with no significant outliers throughout all study phases. The decrease in verbal prompting frequency during the coaching phase may have been the result of James becoming more interested in engaging in the non-preferred activity over time and engaging in less dysregulated behavior related to the scenario overall during this phase of the study.

Encouragement during the parent-identified dysregulating scenario occurred at a low level throughout all study phases. While an increase in frequency of encouragement was observed during the intervention and coaching phases of the study, the change was not significant enough to constitute a change in level. Encouragement frequency had a zero celerating trend during the baseline and intervention phases, and a gradual accelerating trend during the coaching phase. Data were stable with no significant outliers for all study phases. As with the overall data collection session data, redirecting and distracting occurred at a low, stable level with a zero celerating trend throughout all study phases. It should be noted that dysregulation related to the scenario decreased during the intervention and coaching phases, which may explain why this high-support ER strategy did not occur during these phases.

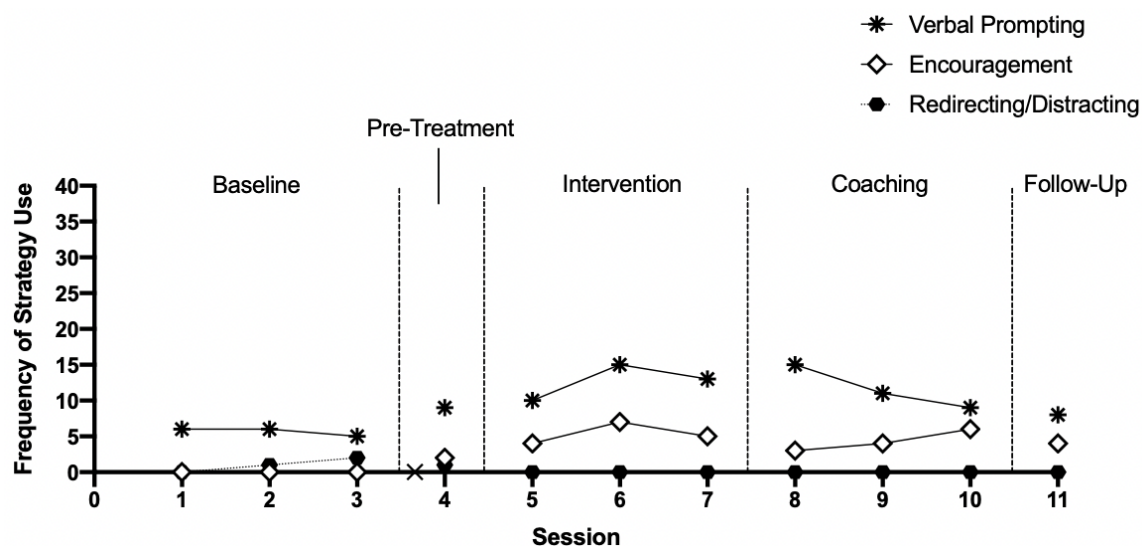


Figure 6. Frequency of strategy use during parent-identified dysregulating scenario (transition to a non-preferred activity) for Case Study A. The x symbol on the graph represents when the hiatus occurred due to COVID-19 quarantine (between RELACS Session 1 and 2, prior to the Pre-Treatment probe).

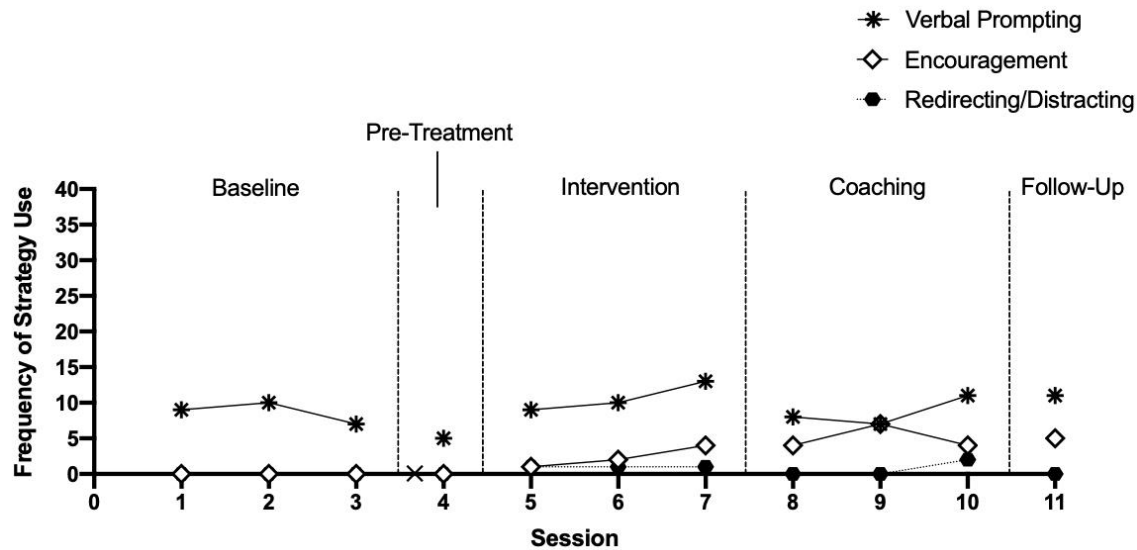


Figure 7. Frequency of strategy use during dysregulating scenario chosen by parent from researcher's repertoire (toy pick up) for Case Study A. The x symbol on the graph represents when the hiatus occurred due to COVID-19 quarantine (between RELACS Session 1 and 2, prior to the Pre-Treatment probe).

The researcher-developed dysregulating scenario for Emma and James consisted of picking up toys after play (see Figure 7). Verbal prompting occurred at a moderate level during all study phases for this scenario. No level change from the baseline phase to the intervention phase was observed, and while a slight increase from the baseline phase to intervention phase was noted, it was not enough of an increase to produce a change in level. The nature of this scenario likely influenced verbal prompting frequency, as there are many natural opportunities for a parent to prompt during a clean-up situation. Verbal prompting frequency had a zero celerating trend during the baseline phase and gradual accelerating trend during the intervention phase and coaching phase. Verbal prompting frequency data were stable with no significant outliers throughout all study phases.

Encouragement during the researcher-developed dysregulating scenario occurred at a low level throughout all study phases. However, it should be noted that while no instances of encouragement were observed during the baseline phase, instances of encouragement were observed during the intervention and coaching phases of the study (though the change was not significant enough to constitute a change in level). Encouragement frequency had a zero celerating trend during the baseline phase and a gradual accelerating trend during the intervention and coaching phases. This data trend suggested that encouragement frequency increased as a result of intervention delivery, albeit not enough to constitute a change in level. Encouragement data were stable with no significant outliers for all study phases. As with the overall data collection session data, redirecting and distracting occurred at a low, stable level throughout all study phases with no change in level observed from the baseline to intervention phase. A zero celerating trend was observed during the baseline and coaching phases, while a gradual accelerating trend was observed during the intervention phase. This change in trend could be attributed to delivery of the intervention, and then was not sustained due to James' lack of dysregulation related to the scenarios during later study phases.

Research Question 2

Is there a functional relationship between delivery of the evidence-based parent training techniques and parent-reported generalization of these targeted strategies to help children regulate their emotions?

Visual analysis measures. A functional relationship was not observed via visual analysis between intervention delivery and parent-reported generalization of targeted strategies, rejecting the original hypothesis (see Figure 8). Emma reported high frequency of strategy use on weekly surveys throughout baseline; while a slight increase in reported strategy use was observed during

the pre-treatment, intervention, and coaching phase, it did not constitute a change in level. At follow-up, Emma's reported use of strategies remained high and no significant change was observed.

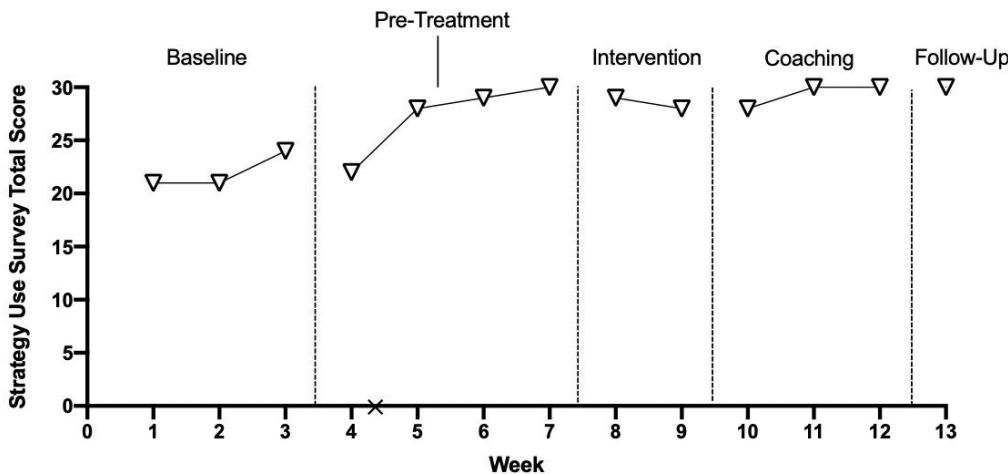


Figure 8. Total scores from weekly survey on frequency of parent strategy use for Case Study A.

Research Question 3

Does delivery of the intervention influence parent ratings of child emotion dysregulation on the Reactivity Total Score of the Emotional Dysregulation Inventory (EDI; Masefsky et al., 2018a)?

Baseline to follow-up measures. The Reliable Change Index (RCI) was calculated to determine if significant change in child dysregulation occurred as measured by the Reactivity Scale of the Emotional Dysregulation Inventory (EDI; see Table 9 for change scores and Appendix I for item-level differences). A significant change in emotional reactivity was reported from pre-intervention to post-intervention ($RC = -11.75; p < .05$). From pre-intervention to follow-up, this significant change was sustained ($RC = -10.88, p < .05$).

Table 9:

EDI Reactivity T Scores and Change Scores for Case Study A

Subscale	Pre- Intervention T- Score	Post- Intervention T- Score	Follow-Up T-Score	RC Score Pre- to Post	RC Score Pre- to Follow-up
Reactivity	47.1	40.4	40.9	-11.75*	-10.88*

Note. * $p < .05$

Supplemental evaluation of child distress. Child distress was also tracked via observational assessment during frustration tasks over the course of the study. Frequency of physical and verbal distress were variable throughout the baseline and coaching phase. A change in overall level of physical and verbal distress was not observed from the baseline to intervention phase. James exhibited a low frequency of physical distress throughout all study phases. During the intervention phase, there was a stable frequency of physical and verbal distress. A steep accelerating rate of verbal distress and a gradual accelerating rate of physical distress was observed during the coaching phase. Emma reported during the final data collection session, James became upset immediately prior to the data collection session because he was not allowed to go outside and play, so it should be noted that much of the dysregulation observed was not directly related to the dysregulating scenarios that occurred during the data collection session. At follow up, James' rates of verbal and physical distress were similar to what was observed during the intervention phase.

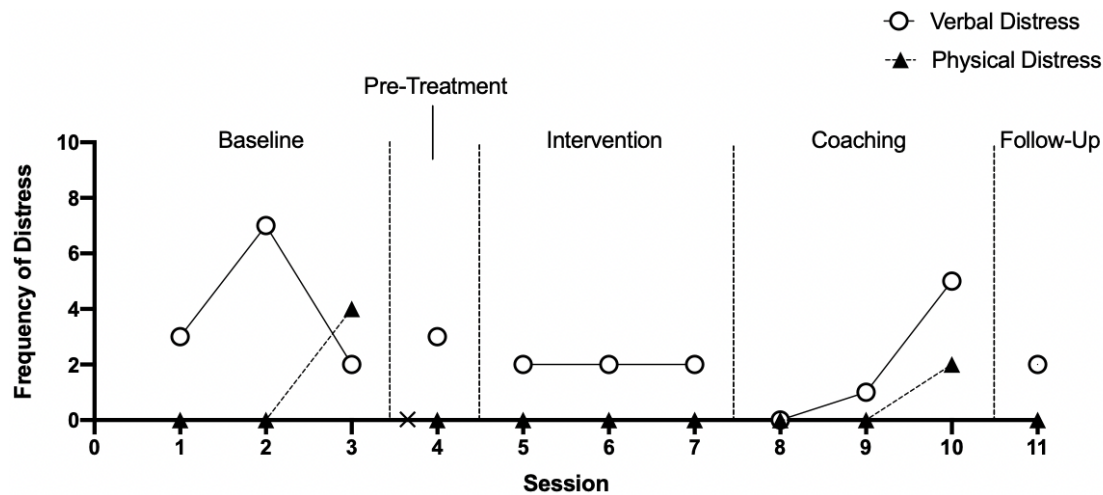


Figure 9. Total frequency of physical and verbal distress per data collection session for Case Study A.

Research Question 4

Does delivery of the intervention influence parent stress as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscale scores of the Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012)?

Baseline to follow-up measures. Change from pre-intervention to post-intervention on the Mood, Adaptability, and Competence subscales of the PSI-4 was calculated using the Reliable Change Index (RCI; Jacobson & Traux, 1991). In Emma's case, the proposed hypotheses were not supported. Reliable change scores did not reflect significant change from pre-intervention to post-intervention on the Mood (H4a; $RC = 1.18$), Adaptability (H4b; $RC = -.71$), or Competence (H4c; $RC = .23$) subscales of the PSI-4 as predicted (see Table 10). Pre-intervention to follow-up scores were also non-significant (Mood $RC = 0$, Adaptability $RC = -1.18$, Competence $RC = -.23$). However, it should be noted that these scores were low at both pre-intervention and post-intervention. Therefore, the lack of change in parent stress observed

was more ideal than if Emma had reported high rates of unchanged stress from pre- to post-intervention.

Table 10:

PSI-4 Scores and Change Scores for Case Study A

	Pre-Intervention T-Score	Post-Intervention T-Score	Follow-Up T-Score	RC Score Pre- to Post	RC Score Pre- to Follow-Up
Mood	44	47	44	1.18	0
Adaptability	56	53	51	-.71	-1.18
Competence	50	51	49	.23	-.23

Note. * $p < .05$

Research Question 5

Is the intervention rated as acceptable by parent participants on the Acceptability Scale of the Behavior Intervention Rating Scale (BIRS; Elliot & Treuting, 1991)?

Acceptability measures. Emma’s ratings on the Behavior Intervention Rating Scale revealed that she found the intervention to be acceptable, as evidenced by an average score of 5 (“Strongly Agree”) on the Acceptability scale (see Table 11; Elliot & Treuting, 1991). Emma gave an average score of 3.29 (between “Agree Just a Little Bit” and “Agree”) on the Effectiveness scale, demonstrating slight agreement that the intervention produced, maintained, and generalized change. Finally, an average score of 4 (“Agree”) on the Time scale demonstrated that Emma felt the intervention was effective in terms of the rate of change noted after implementation.

The Adapted Performance Feedback Acceptability and Feasibility Rating (Machalicek, 2008) was used as a secondary measure of acceptability of the telehealth-delivery aspect of the intervention (see Table 12). Emma’s average rating on this measure was 4.64, falling between

“Agree” and “Strongly Agree” on the Likert scale. This average score indicates that telehealth-delivery of this intervention was acceptable and feasible for Emma and James. It should be noted that at the item level, Emma strongly agreed (as evidenced by a rating score of 5) that telehealth was practical and that she would recommend telehealth to other parents. In contrast, she gave a low rating regarding the difficulty of implementing telehealth-based skills. This rating was notably different from her anecdotal report during the follow-up interview, where she discussed how convenient telehealth was for learning and practicing the skills for the intervention.

Table 11:

BIRS Post-Intervention Scores: Case Study A

No.	Item	Score
1	This program was an acceptable way to learn about helping my child manage emotion.	5
2	Most parents would think this program was a good way to learn about helping children manage emotion.	5
3	The program was effective in improving my parenting skills and helping support my child’s emotion.	5
4	I would suggest that other parents participate in this program.	5
5	My child’s difficulties with managing emotion were severe enough to warrant use of this program.	5
6	Most parents would find this program suitable for addressing dysregulated emotion in children.	5
7	I would be willing to participate in a program like this again.	5
8	Participating in the program did not result in negative side-effects for my child.	5
9	The program would be appropriate for a variety of children with autism.	5
10	The parenting skills taught in the program are consistent with those I have used before.	5
11	This program was a fair way to learn how to support my child’s emotion regulation.	5
12	This program was reasonable for learning to support emotion regulation in my child.	5
13	I liked the procedures used in this program.	5
14	This program was a good way to handle dysregulated emotion.	5
15	Overall, the program was beneficial for my child.	5
16	The intervention quickly improved my child’s behavior.	4
17	The intervention produced a lasting improvement in my child’s emotional regulation.	5

Table 11 (cont'd)

18	The intervention has improved my child's emotion regulation behavior to the point that it does not noticeably deviate from peers' emotion regulation behavior.	1
19	Soon after using the intervention, I noticed a positive change in my child's behavior.	4
20	My child's behavior will remain at an improved level even after the program is discontinued.	4
21	Using the program has improved my child's behavior in the home, but also in other settings (e.g., community, school).	4
22	When comparing my child with an emotionally-regulated peer before and after use of the program, my child's and the peer's ability to manage emotion is more alike after using the program.	3
23	The program has produced enough improvement in my child's behavior that emotional dysregulation is no longer a problem at home.	2
24	Other behaviors related to emotional dysregulation have also been improved by the program.	4

Note. 0 = Strongly Disagree, 1 = Disagree, 2 = Disagree just a little bit, 3 = Agree just a little bit,

4 = Agree, 5 = Strongly Agree.

Table 12:

APRAFR Post-Intervention Scores: Case Study A

No.	Item	Score
1	Implementing new skills learned via the telehealth process (i.e., Zoom) was not too difficult.	0
2	This telehealth process has helped to clarify how to implement strategies to address the concerns I had for my child.	5
3	I would recommend telehealth to other parents.	5
4	Telehealth was practical.	5
5	The telehealth intervention I received has strengthened my skills in addressing the concerns I had for my child.	5
6	Efforts made by the interventionist to reinforce my attempts at using the skills and after completing data collection activities were acceptable to me.	5
7	The interventionist's delivery of constructive feedback was acceptable to me.	5
8	My child has benefitted from this telehealth intervention.	5
9	I think that telehealth is an appropriate way to teach strategies to address child social/emotional/behavioral concerns.	5
10	This model of telehealth would be helpful in teaching parents to implement other strategies to address child social/emotional/behavioral concerns.	5

Table 12 (cont'd)

11	I feel confident in my ability to implement the strategies I learned through this telehealth intervention process with my child.	5
12	Other parents should participate in this model of telehealth.	5
13	The technical aspects of video telehealth were effective (e.g., clear picture and sound, speed of transmission, etc.).	5
14	Setting up the equipment for telehealth sessions was feasible.	5

Note. 0 = Strongly Disagree, 1 = Disagree, 2 = Slightly Disagree, 3 = Slightly Agree, 4 = Agree,

5 = Strongly Agree.

Treatment Fidelity. Treatment fidelity was coded and calculated by a secondary observer. In Emma and James' case, interventionist adherence to treatment protocol was 100% across all intervention sessions.

Follow-up interview and qualitative data. Emma reported that RELACS was the first intervention she had received for James where emotion and challenging child behavior were the focus. "The content was similar to a lot of parenting books I'd read, but the feedback was crucial," she noted. Emma explained that for her personally, receiving praise and feedback from the interventionist made her feel more confident and less anxious when using strategies to promote and support James' emotion regulation. She also reported that James enjoyed having special individual time with her during sessions and while practicing the strategies with him at home. Emma noted that James started to vocalize his emotional states rather than immediately engaging in dysregulated behavior. Emma reported that the RELACS intervention could be improved by having more opportunities to engage in practice and receive active feedback from the interventionist and return to previous strategies taught in earlier sessions more frequently. She stated that RELACS felt very different from her experience with speech and occupational therapy services for James and explained that the parent role was very limited in those services. Finally, Emma felt that RELACS should have been presented as a treatment option by James'

physician when he received his diagnosis in the same way ABA and other services were presented.

Video Observations

There were several other changes in Emma and James' video-recorded interactions over the course of the study that were not fully captured by the quantitative data and worth noting. For example, Emma's verbal prompting style became more specific during the intervention and coaching phases of the study. She began to use verbal prompts such as "Please sit calmly next to mama" instead of "Come here!" Her encouragement also became more specific, moving from phrases like "Good job" to "Thank you for bringing those back to me." Emotion labeling also became part of interactions between Emma and James during data collection scenarios. For instance, Emma told James "They all feel sad" after toy puppets fell out of their box during play. Finally, parent-child interaction during the play break between dysregulating scenarios also increased once the RELACS intervention began. During baseline, there was very little interactive play observed between Emma and James.

Case Study B: Katie and Max

Demographic Information

Katie was a 34-year-old Caucasian married mother of two children (Max and his ten-year old sister). Katie indicated that she completed a high school education and that their estimated annual family income was \$70,000. Max was 4 years, 11 months old at the time of eligibility testing and received a diagnosis of autism spectrum disorder from a developmental behavioral pediatric clinic at the age of 4 years. In the school setting, he qualified for early childhood special education services under the eligibility status of speech-language impairment at 18 months old. During the eligibility testing phase, Katie endorsed that Max exhibited

approximately four weekly instances of emotionally dysregulated behavior including screaming/yelling, running around the room, and occasionally flailing his limbs while lying on the floor.

Background Information

At the start of (March 2021) and throughout intervention, Katie worked as a stay-at-home mother while her husband worked outside of the home and traveled frequently. During the work week, Katie was responsible for caring for Max and helping her older daughter complete remote schooling. Katie and Max participated in twice-weekly sessions throughout intervention. Between RELACS Session 3 and the Pre-Treatment data collection probe, Katie and her husband became sick and tested positive for COVID-19. They experienced mild symptoms and quarantined for two weeks but did not need to be hospitalized. Max and his sister did not contract the virus. Katie felt healthy enough to participate in the following session without taking a hiatus from scheduled sessions, though the option for a hiatus was offered by the researcher. During the RELACS intervention, Max qualified to receive in-home ABA services and was placed on a waitlist. These services had not started at the time of follow-up for the current study. It should be noted that due to limited social contact outside of the household resulting from the COVID-19 pandemic, there were instances throughout all study phases where RELACS sessions were occasionally interrupted by Max or his older sibling entering the room and asking Katie for assistance on a task they were working on. These interruptions did not take place during data collection sessions, only during RELACS sessions.

Research Question 1

Is there a functional relationship between delivery of evidence-based parent training techniques and parent use of verbal encouragement (H1a), verbal prompting (H1b), or verbal redirecting/distracting (H1c) to help children regulate their emotions?

Visual analysis measures. The level of observed strategy use frequency was low during the baseline and pre-treatment phase and moderate during the intervention phase, coaching phase, and follow-up probe. A change in level (from low to moderate) was observed from the baseline to intervention phase. No overall change in level was observed from the intervention to coaching phase. A zero celerating trend was present in the baseline phase and intervention phase. A steep accelerating trend was present in the coaching phase. When analyzing trend across all study phases, a gradual accelerating trend was present. Data points across study phases were stable with no significant outliers present. In Katie's case, a functional relationship between intervention delivery and total parent strategy use was demonstrated as evidenced by a strong and significant effect observed from baseline to intervention and baseline to coaching (Tau =100%, $p = .03$; see Figure 10 and Table 13). A strong (in terms of effect size) but statistically nonsignificant effect was also observed from baseline to follow-up (Tau =100%, $p = .14$). The weighted average derived from combining all phase contrasts also suggests a high, significant effect for total strategy use (Tau = 92%, $p = .004$). A functional relationship was observed for total frequency of parent strategy use in Katie's case based on visual analyses and TauU calculations.

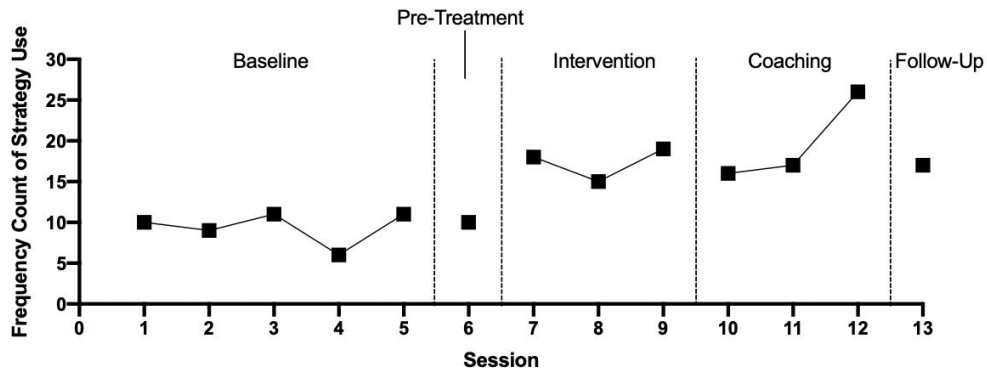


Figure 10. Total frequency of parent strategy use per data collection session for Case Study B.

Table 13:

Total Frequency TauU Phase Contrasts and Weighted Average Scores for Case Study B

Phase Contrast	Tau Score (%)	p-value
Baseline to Pre-Treatment	0%	1.00
Pre-Treatment to Intervention	100%	.18
Baseline to Intervention	100%	.03*
Baseline to Coaching	100%	.03*
Baseline to Follow-Up	100%	.14
Intervention to Coaching	11%	.82
Weighted Average	70%	.004*

Note. * = statistically significant.

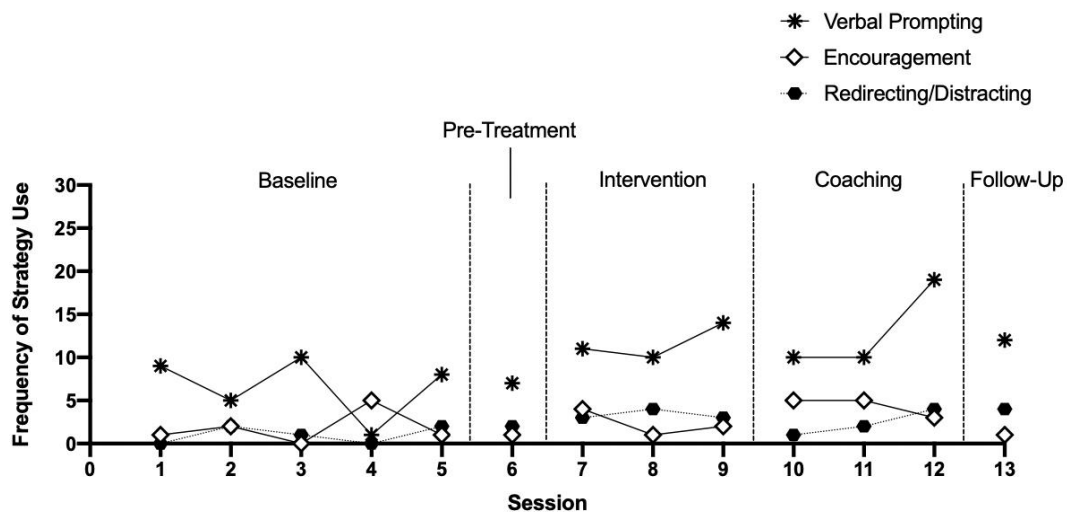


Figure 11. Frequency of verbal prompting, encouragement, and redirecting/distracting strategy use per data collection session for Case Study B.

Visual analyses were also conducted to review the results of each parent strategy separately (see Figure 11). Level of verbal prompting frequency was low during the baseline and pre-treatment phase, moderate during the intervention phase, moderate to high during the coaching phase, and moderate during the follow-up probe. A slight increase in frequency from baseline to pre-treatment was noted, but not significant enough to constitute a change in level. A change in level from baseline to intervention was observed. No change in level from the intervention to coaching phase was observed. Analysis of trend revealed a zero celerating trend in the baseline phase, a gradual decelerating trend in the intervention phase, and a steep accelerating trend in the coaching phase. An overall gradual accelerating trend was observed across all study phases. Data were somewhat variable in the baseline phase and stable across all other study phases with no visible outliers. A significant, strong effect was observed from baseline to intervention and baseline to coaching (Tau = 100%, $p = .04$ and $p = .05$, respectively) for parent use of verbal prompting. The weighted average of phase contrasts also demonstrated a moderate, significant effect (Tau = 59%, $p = .01$), suggesting a functional relationship between intervention delivery and parent use of verbal prompting for Case Study B (H1a; see Table 14).

Table 14:

Verbal Prompting TauU Phase Contrasts and Weighted Average Scores for Case Study B

Phase Contrast	Tau Score (%)	p -value
Baseline to Pre-Treatment	-20%	.76
Pre-Treatment to Intervention	100%	.18
Baseline to Intervention	93%	.04*
Baseline to Coaching	87%	.05*
Baseline to Follow-Up	100%	.14
Intervention to Coaching	-11%	.82
Weighted Average	59%	.01

Note. * = statistically significant.

The hypothesis that there would be a functional relationship between delivery of the intervention and parent use of encouragement was not supported based on visual analysis and TauU calculations (see Table 15). Encouragement frequency was at a low level during the baseline phase, intervention phase, and coaching phase. No change in level was observed from the baseline phase to the intervention phase, nor from the intervention to coaching phase. A zero celerating trend was observed within and across all study phases. Frequency of encouragement data points were somewhat variable in the baseline phase and stable across the intervention and coaching study phases, with no significant outliers. A moderate, nonsignificant effect was found from baseline to intervention (Tau = 27%, $p = .55$), and a moderate but nonsignificant effect was found from baseline to coaching (Tau = 73%, $p = .10$), thus rejecting the proposed hypothesis (H1b). Weighted average calculation also revealed a moderate, nonsignificant effect when phase contrasts were combined (Tau = 38%, $p = .12$).

Table 15:

Encouragement TauU Phase Contrasts and Weighted Average Scores for Case Study B

Phase Contrast	Tau Score (%)	p -value
Baseline to Pre-Treatment	-20%	.77
Pre-Treatment to Intervention	67%	.37
Baseline to Intervention	27%	.55
Baseline to Coaching	73%	.10
Baseline to Follow-Up	-20%	.77
Intervention to Coaching	78%	.13
Weighted Average	38%	.12

Note. * = statistically significant.

Redirecting and distracting occurred at a low level across all study phases; no change in level was observed from the baseline phase to intervention phase nor the intervention phase to coaching phase. A zero celerating trend was present within the baseline phase and intervention phase. A gradual accelerating trend was observed within the coaching phase. Across all study

phases, data were stable with no significant outliers noted. TauU phase contrasts revealed a strong, significant effect from baseline to intervention (Tau = 100%; $p = .03$) and a moderate, non-significant effect from baseline to coaching (Tau = 53%, $p = .23$; see Table 16). Combining phase contrasts into a weighted average yielded a moderate, significant effect (Tau = 58%, $p = .02$). Though TauU calculations indicate a significant treatment effect, the visual analyses do not provide unequivocal support of a functional relationship between intervention delivery and parent use of redirecting/distracting for Case Study B (H1c).

Table 16:

Redirecting/Distracting TauU Phase Contrasts and Weighted Average Scores for Case Study B

Phase Contrast	Tau Score (%)	p -value
Baseline to Pre-Treatment	60%	.38
Pre-Treatment to Intervention	100%	.18
Baseline to Intervention	100%	.03*
Baseline to Coaching	53%	.23
Baseline to Follow-Up	100%	.14
Intervention to Coaching	-44%	.38
Weighted Average	58%	.02*

Note. * = statistically significant.

Visual analysis within individual dysregulating scenarios. The parent-identified dysregulating scenario for Case Study B was trying on non-Mickey Mouse themed COVID-19 safety masks (see Figure 12. Verbal prompting occurred at a low level during the baseline phase, a moderate level during the intervention phase, and a moderate level during the coaching phase, and a moderate level during the follow-up probe. While a slight increase in verbal prompting from the baseline phase to pretreatment phase was noted, it was not enough of an increase to constitute a change in level. A level change from the baseline phase to the intervention phase was observed. No level change was observed from the baseline to coaching phase. Verbal prompting frequency had a gradual decelerating trend during the baseline phase, gradual

accelerating trend during the intervention phase, and steep accelerating trend during the coaching phase. Verbal prompting frequency data were stable with no significant outliers throughout all study phases. The increase in verbal prompting frequency during the coaching phase may be indicative of Katie's positive response to interventionist coaching and feedback.

Encouragement during the parent-identified dysregulating scenario occurred at a low level throughout all study phases. While an increase in overall frequency of encouragement was observed during the intervention and coaching phases of the study, the change was not significant enough to constitute a change in level. Encouragement frequency had a zero celerating trend during the baseline and intervention phases, and a gradual decelerating trend during the coaching phase. The deceleration of encouragement in the coaching phase corresponded with an acceleration in verbal prompting, suggesting that Katie relied more heavily on the latter strategy during this study phase. Data were stable with no significant outliers for all study phases. As with the total data collection session data, redirecting and distracting occurred at a low, stable level with a zero celerating trend throughout all study phases.

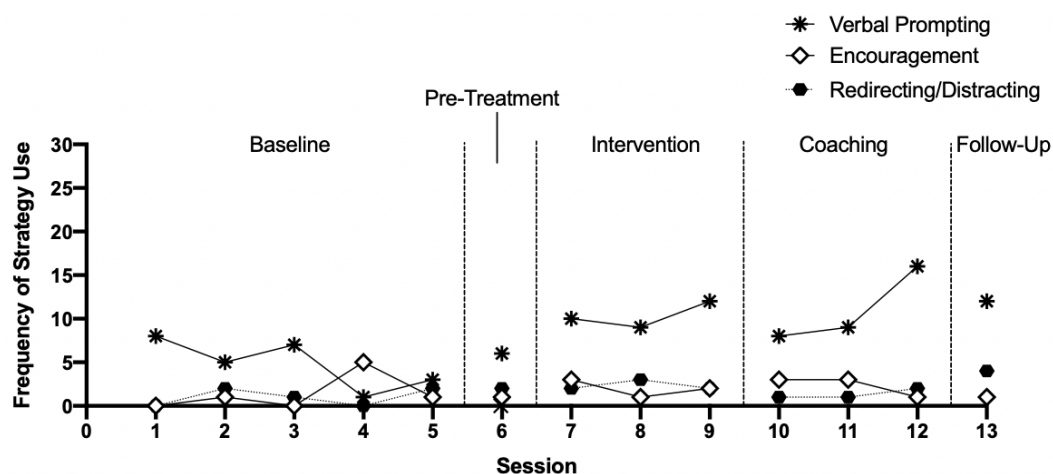


Figure 12. Frequency of strategy use during parent-identified dysregulating scenario (trying on pandemic masks) for Case Study B. The x symbol represents when Katie tested positive for COVID-19 (the week of the Pre-Treatment probe); no hiatus occurred.

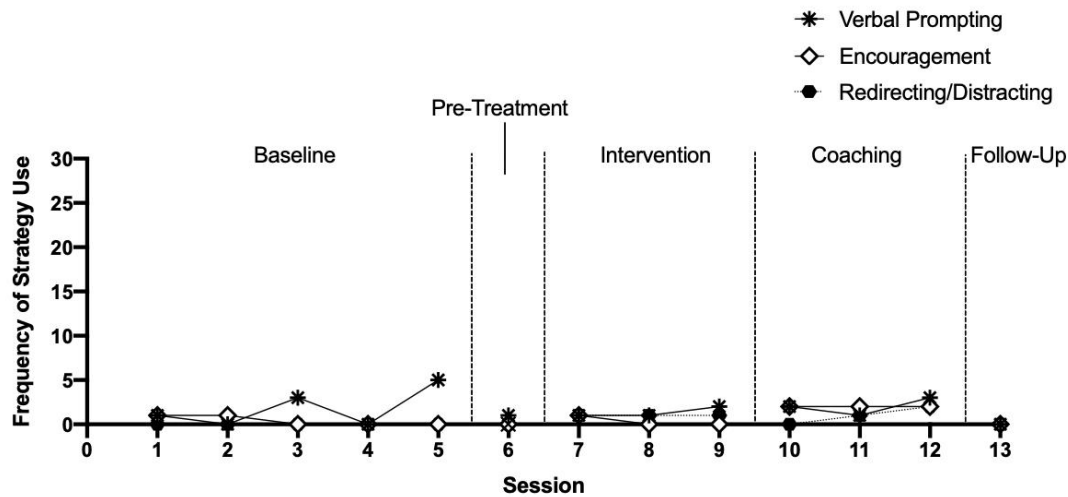


Figure 13. Frequency of strategy use during dysregulating scenario chosen by parent from researcher’s repertoire (video interruption) for Case Study B. The x symbol represents when Katie tested positive for COVID-19 (the week of the Pre-Treatment probe); no hiatus occurred.

The researcher-developed dysregulating scenario for Katie and Max was interrupting a preferred video and having to wait until it turned back on (see Figure 13). Verbal prompting, encouragement, and redirecting/distracting occurred at a low level throughout all study phases with no change in level observed from the baseline to intervention phase for any strategy. Verbal prompting use was slightly variable during the baseline phase. Encouragement and redirecting/distracting data were stable with no significant outliers. While not enough to constitute a change in level, a slightly higher frequency of encouragement was observed during the intervention phase, suggesting that Katie did use this higher-order strategy slightly more often following intervention delivery. This low level and frequency of strategy use is likely due to Max requiring very little ER support during this scenario, as evidenced by overall lack of dysregulation related to this scenario across all study phases.

Research Question 2

Is there a functional relationship between delivery of the evidence-based parent training techniques and parent-reported generalization of these targeted strategies to help children regulate their emotions?

Visual analysis measures. A functional relationship was not observed via visual analysis between intervention delivery and parent-reported generalization of targeted strategies (see Figure 14. Katie reported high frequency of strategy use on weekly surveys throughout the baseline and intervention phase. At follow-up, Katie's reported use of strategies remained high and no significant change from previous study phases was observed.

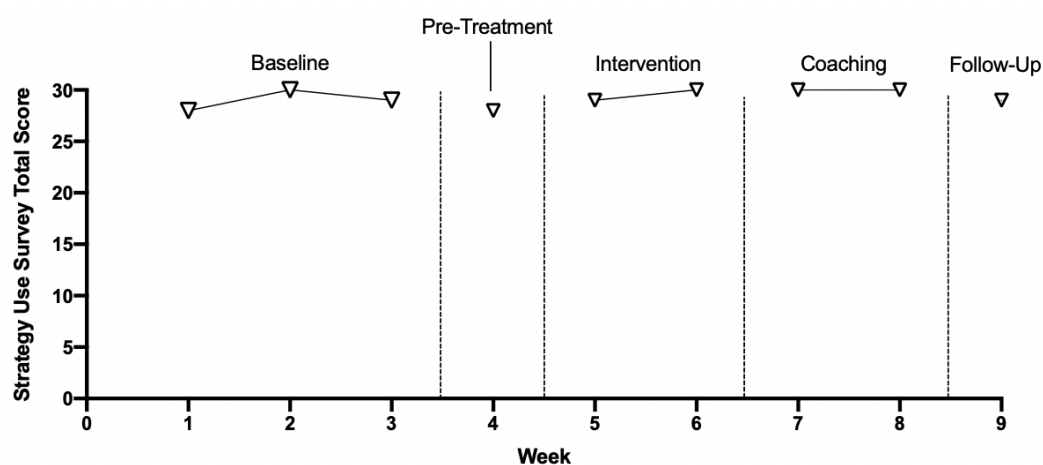


Figure 14. Total scores from weekly survey on frequency of parent strategy use for Case Study B.

Research Question 3

Does delivery of the intervention influence parent ratings of child emotion dysregulation on the Reactivity Total Score of the Emotional Dysregulation Inventory (EDI; Masefsky et al., 2018a)?

Baseline to follow-up measures. The Reliable Change Index (RCI) was calculated to determine if significant change in child dysregulation occurred as measured by the Reactivity Scale of the Emotional Dysregulation Inventory (EDI; see Table 17 for change scores and Appendix J for item-level differences). A significant change in emotional reactivity was reported from pre-intervention to post-intervention ($RC = -13.86; p < .05$). From pre-intervention to follow-up, an even greater change was observed ($RC = -20.70, p < .05$).

Table 17:

EDI Reactivity T Scores and Change Scores for Case Study B

Subscale	Pre-Intervention T-Score	Post-Intervention T-Score	Follow-Up T-Score	RC Score Pre- to Post	RC Score Pre- to Follow-up
Reactivity	45.2	37.3	33.4	-13.86*	-20.70*

Note. * $p < .05$

Supplemental evaluation of child distress. Rates of verbal and physical distress during observational data collection sessions were variable for Max (see Figure 15). While his highest rates of verbal and physical distress occurred during baseline and pre-treatment, his overall frequency of physical and verbal distress did not decrease significantly as a result of intervention delivery or coaching. At follow-up, Max's rates of verbal distress were similar to what was observed during previous study phases, while his physical distress was at its lowest frequency during the follow-up phase.

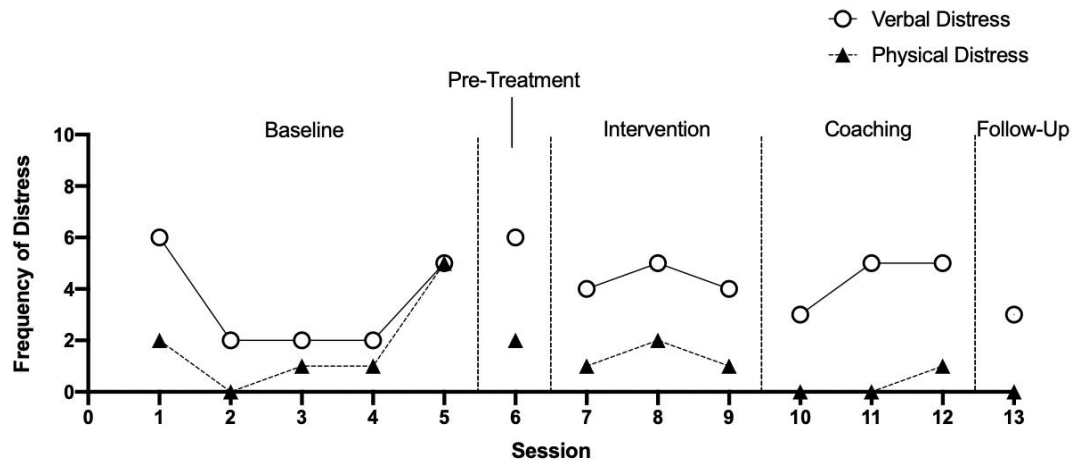


Figure 15. Total frequency of physical and verbal distress per data collection session for Case Study B.

Research Question 4

Does delivery of the intervention influence parent stress as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscale scores of the Parenting Stress Index—Fourth Edition (PSI-4; Abidin, 2012)?

Baseline to follow-up measures. Change from pre-intervention to post-intervention on the Mood, Adaptability, and Competence subscales of the PSI-4 was calculated using the Reliable Change Index (RCI; Jacobson & Traux, 1991). In Katie's case, the proposed hypotheses were not supported. Reliable change scores did not reflect significant change from pre-intervention to post-intervention on the Mood (H4a; $RC = 3.94$), Adaptability (H4b; $RC = -.71$), or Competence (H4c; $RC = -.46$) subscales of the PSI-4 as predicted (see Table 18). Pre-intervention to follow-up scores were also non-significant (Mood $RC = 3.94$, Adaptability $RC = -.94$, Competence $RC = -.46$). However, it should be noted that as in Katie's case, these scores were low at both pre-intervention, post-intervention, and follow-up. Therefore, the lack of change in parent stress observed was more ideal than if Katie had reported high rates of unchanged stress from pre- to post-intervention.

Table 18:

PSI-4 Scores and Change Scores for Case Study B

Subscale	Pre-Intervention T-Score	Post-Intervention T-Score	Follow-Up T-Score	RC Score Pre- to Post	RC Score Pre- to Follow-up
Mood	49	39	39	3.94*	3.94*
Adaptability	52	49	48	-.71	-.94
Competence	40	38	38	-.46	-.46

Note. * $p < .05$

Research Question 5

Is the intervention rated as acceptable by parent participants on the Acceptability Scale of the Behavior Intervention Rating Scale (BIRS; Elliot & Treuting, 1991)?

Acceptability measures. Katie’s average rating on the Acceptability scale of the BIRS was a 4 (“Agree”), indicating that the current study’s intervention was viewed as acceptable (see Table 19). On the Effectiveness scale, Katie gave an average rating of 3.71 (between “Agree Just a Little Bit” and “Agree”), revealing slight agreement that the intervention produced, maintained, and generalized change. Finally, an average score of 4 (“Agree”) on the Time scale demonstrated that Katie, like Emma, felt the intervention was effective in terms of the rate of change noted after implementation of the intervention.

The Adapted Performance Feedback Acceptability and Feasibility Rating (Machalicek, 2008) was used as a secondary measure of acceptability of the telehealth-delivery aspect of the intervention (see Table 20). Katie’s average rating on this measure was 4.07, falling between “Agree” and “Strongly Agree” on the Likert scale. This average score indicates that telehealth-delivery of this intervention was acceptable and feasible for Katie. It should be noted that at the item level, Katie strongly agreed (as evidenced by a rating score of 5) that the telehealth process

helped to clarify how to implement strategies for her child, but only slightly agreed (rating score of 3) that the technical aspects of video telehealth were effective (clear picture/sound, etc.).

Table 19:

BIRS Post-Intervention Scores: Case Study B

No.	Item	Score
1	This program was an acceptable way to learn about helping my child manage emotion.	4
2	Most parents would think this program was a good way to learn about helping children manage emotion.	4
3	The program was effective in improving my parenting skills and helping support my child's emotion.	4
4	I would suggest that other parents participate in this program.	4
5	My child's difficulties with managing emotion were severe enough to warrant use of this program.	3
6	Most parents would find this program suitable for addressing dysregulated emotion in children.	4
7	I would be willing to participate in a program like this again.	4
8	Participating in the program did not result in negative side-effects for my child.	5
9	The program would be appropriate for a variety of children with autism.	4
10	The parenting skills taught in the program are consistent with those I have used before.	4
11	This program was a fair way to learn how to support my child's emotion regulation.	4
12	This program was reasonable for learning to support emotion regulation in my child.	4
13	I liked the procedures used in this program.	4
14	This program was a good way to handle dysregulated emotion.	4
15	Overall, the program was beneficial for my child.	5
16	The intervention quickly improved my child's behavior.	4
17	The intervention produced a lasting improvement in my child's emotional regulation.	4
18	The intervention has improved my child's emotion regulation behavior to the point that it does not noticeably deviate from peers' emotion regulation behavior.	4
19	Soon after using the intervention, I noticed a positive change in my child's behavior.	4
20	My child's behavior will remain at an improved level even after the program is discontinued.	4
21	Using the program has improved my child's behavior in the home, but also in other settings (e.g., community, school).	4

Table 19 (cont'd)

22	When comparing my child with an emotionally-regulated peer before and after use of the program, my child's and the peer's ability to manage emotion is more alike after using the program.	3
23	The program has produced enough improvement in my child's behavior that emotional dysregulation is no longer a problem at home.	3
24	Other behaviors related to emotional dysregulation have also been improved by the program.	4

Note. 0 = Strongly Disagree, 1 = Disagree, 2 = Disagree just a little bit, 3 = Agree just a little bit,

4 = Agree, 5 = Strongly Agree.

Table 20:

APRAFR Post-Intervention Scores: Case Study B

No.	Item	Score
1	Implementing new skills learned via the telehealth process (i.e., Zoom) was not too difficult.	4
2	This telehealth process has helped to clarify how to implement strategies to address the concerns I had for my child.	5
3	I would recommend telehealth to other parents.	3
4	Telehealth was practical.	4
5	The telehealth intervention I received has strengthened my skills in addressing the concerns I had for my child.	4
6	Efforts made by the interventionist to reinforce my attempts at using the skills and after completing data collection activities were acceptable to me.	4
7	The interventionist's delivery of constructive feedback was acceptable to me.	3
8	My child has benefitted from this telehealth intervention.	4
9	I think that telehealth is an appropriate way to teach strategies to address child social/emotional/behavioral concerns.	4
10	This model of telehealth would be helpful in teaching parents to implement other strategies to address child social/emotional/behavioral concerns.	4
11	I feel confident in my ability to implement the strategies I learned through this telehealth intervention process with my child.	4
12	Other parents should participate in this model of telehealth.	4
13	The technical aspects of video telehealth were effective (e.g., clear picture and sound, speed of transmission, etc.).	3
14	Setting up the equipment for telehealth sessions was feasible.	4

Note. 0 = Strongly Disagree, 1 = Disagree, 2 = Slightly Disagree, 3 = Slightly Agree, 4 = Agree,

5 = Strongly Agree.

Treatment Fidelity. Treatment fidelity was coded and calculated by a secondary observer. In Katie and Max's case, interventionist adherence to treatment protocol was high (range 92%-100%; average = 97.9%).

Follow-up interview and qualitative data. During the follow-up interview, Katie explained that the RELACS intervention allowed her to learn new strategies to help Max calm down when dysregulated, and that she sometimes found herself using them outside of sessions without intentionally doing so. She went on to report that she felt Max now transitions between routines a little easier and that his episodes of dysregulated behavior seem to have decreased in average duration. "He seems to calm a little quicker, easier now," Katie noted. Regarding intervention delivery, Katie said she enjoyed the visual materials that accompanied each session and felt that though telehealth worked well, the intervention may have been slightly more beneficial if held in-person. Katie stated that the RELACS intervention was very different from Max's past speech intervention services, as speech had less parent involvement overall. Katie noted that ideally, she would like to have learned about and participated in the intervention more shortly after receiving Max's autism diagnosis, but she liked that the intervention was recommended to her by a trusted teacher who knew Max well.

Video Observations

As with Emma and James, there were several observable changes noted in Katie and Max's videorecorded interactions over the course of the study that were not represented in the quantitative data. After the third RELACS session (which focuses on teaching the parent how to model emotion regulation during natural and contrived scenarios), Max began to incorporate an emotion regulation routine into his play sequence during which he would pretend to pound his finger while playing with the pound a peg toy, say "Ouch!" and then look at Katie, who would

then label the emotion he was showing. Katie's verbal prompting and encouragement style also became more specific after the systematic training intervention. She began to use prompts such as "Come sit next to me" instead of "Come here" during dysregulating scenarios and use encouraging phrases such as "Nice job trying on the mask" instead of "Good job, buddy."

Table 21:

Summary of Results

Research Question	Emma and James	Katie and Max	Across Cases
1. Is there a functional relationship between delivery of evidence-based parent training techniques and parent use of strategies to help children regulate their emotions?	Change in level from baseline to intervention observed. Medium to high effect demonstrated (Tau = 69%) for total strategy use frequency.	Change in level from baseline to intervention observed. Medium to high effect demonstrated (Tau = 92%) for total strategy use frequency.	A change in level of total strategy use frequency from baseline to intervention was observed. Significance supported by Tau-U.
Hypothesis: Delivery of the evidence-based training techniques would significantly increase parent strategy use in response to intervention delivery.	Change in level from baseline to intervention observed for verbal prompting (Tau = 51%) and encouragement (Tau = 91%), but not for redirecting/distracting (Tau = -20%).	Change in level from baseline to intervention observed for verbal prompting (Tau = 59%) and redirecting/distracting (Tau = 58%), but not for encouragement (Tau = 38%).	Frequency of verbal prompting significantly increased in both cases, but frequency of encouragement and redirecting/distracting were variable.
2. Is there a functional relationship between delivery of the evidence-based parent training techniques and parent-reported generalization of strategies?	No functional relationship was observed. Emma reported high frequency of strategy use across all study phases.	No functional relationship was observed. Katie reported high frequency of strategy use across all study phases.	A functional relationship between delivery of the evidence-based parent training techniques and parent-reported strategy use was not observed in either case.
Hypothesis: There will be a functional relationship between the evidence-based parent training techniques and parent self-reported generalization of targeted strategies to help their child regulate their emotions.			

Table 21 (cont'd)

3. Does delivery of the intervention influence parent ratings of child emotion dysregulation?			
Hypothesis: Delivery of the intervention will significantly decrease parent ratings of child dysregulation on average from pre-intervention to post-intervention, as measured by the Reactivity Scale Score of EDI.	Change in pre- to post-intervention EDI scores and pre-intervention to follow-up scores were significant ($p = .05$).	Change in pre- to post-intervention EDI scores and pre-intervention to follow-up scores were significant ($p = .05$).	Significant change in parent reported child emotional reactivity was reported from pre- to post-intervention, and this change was sustained at follow-up for both cases.
4. Does delivery of the intervention influence parent stress?			
Hypothesis: Delivery of the intervention will significantly decrease parent stress ratings from pre- to post- intervention as measured by the Mood (H4a), Adaptability (H4b), and Competence (H4c) subscales of PSI.	Emma reported low stress ratings and adequate parenting competence throughout all study phases. No significant change was observed.	Katie reported low stress ratings and adequate parenting competence throughout all study phases. Significant change on the Mood subscale was observed.	A lack of change in parent stress was observed, but these findings were more ideal than if high levels of unchanged stress were observed.
5. Is the intervention rated as acceptable by parent participants?			
Hypothesis: Parents will rate the intervention as acceptable on the Acceptability Scale of the Behavior Intervention Rating Scale.	On average, Emma “Strongly Agreed” that the intervention was acceptable. Telehealth delivery was also rated as acceptable, with the average score falling between “Agree” and “Strongly Agree.”	On Average, Katie “Agreed” that the intervention was acceptable. Telehealth delivery was also rated as acceptable, with the average score falling between “Agree” and “Strongly Agree.”	Both parents rated the RELACS intervention as acceptable and effective, with some item-level variability. The telehealth-delivery aspect was also rated as acceptable in both cases.

CHAPTER 5

DISCUSSION

Rationale and Purpose of Study

Children with autism spectrum disorder display higher rates of emotion dysregulation and often experience greater difficulty modulating emotional responses than children without an autism diagnosis (Samson et al., 2014; Fenning et al., 2018). The development of emotion regulation (ER) in early childhood is largely dependent on maternal scaffolding, and parent lack of ER-supportive strategies with their children with ASD has been identified as a significant predictor of externalizing behavior problems (Ting & Weiss, 2017). While parents of preschoolers with ASD report an eagerness to gain knowledge and learn practical strategies to support their child's specific needs, the verbal ER strategies that have been linked to more positive child emotionality are used less often by parents of children with ASD (Hirschler-Guttenberg et al., 2014; Whitaker, 2002). Adaptive child ER skill development is reliant on parent delivery of these strategies. This suggests the need for a method to train parents to learn and implement these strategies effectively.

The purpose of the current study was to determine whether delivery of an adapted version of the RELACS intervention via evidence-based parent training techniques would influence parent use of strategies (encouragement, verbal prompting, and redirecting and distracting) to promote and support ER in their preschoolers with autism spectrum disorder. The preschool age marks a developmental shift towards independent ER, during which parents can support their child by combining ER strategies from toddlerhood that provide a high level of parental support (i.e., redirecting and distracting) with lower-support strategies that promote independent regulation (e.g., verbal prompting and encouragement; Feldman et al., 2011; Morris et al.,

2011). The pilot study of RELACS revealed variable strategy implementation across parents (Rispoli et al., in press), which led the researchers to consider possible directions for improving the parent training component of the intervention in future studies. Beyond RELACS, there is a lack of research exploring the application of evidence-based teaching strategies as a means of teaching parents how to implement strategies to promote ER within this population. Establishing an evidence for the training procedure used to transfer these skills from interventionist to parent is necessary to ensure successful parent use of these strategies, which is why further research on this topic was warranted. Training adult learners to implement child-focused interventions with fidelity is a necessary step towards validating a new training practice, and the current study aimed to provide information pertaining to this subject that could be applied in future studies with the goal of expanding the scope of training practices used in a multitude of settings, including telehealth. This was the first study to examine whether parent training techniques influence parent use of strategies to promote and support ER in young children with ASD.

Two mothers of four-year-old children with a medical diagnosis of autism spectrum disorder received a four-session version of the RELACS parent-mediated ER intervention. During the final intervention session, parents were taught, using evidence-based teaching techniques, how to implement encouragement, verbal prompting, and redirecting/distracting strategies. Three coaching sessions followed the final intervention session, in which parents practiced the strategies with their child and received constructive feedback and coaching from the interventionist regarding their implementation. The author of this manuscript served as the interventionist, and treatment fidelity was high as coded by a secondary observer (100% average for Case Study A, 97.9% average for Case Study B). Visual analyses of total frequency of parent strategy use across intervention phases resulted in a change in level of frequency from baseline

to intervention and a gradual accelerating trend for both case studies; these results were supported by strong and significant effects as measured by Tau-U ($p = .05$ and $p = .03$ for Case Study A and B, respectively). No overall change in level of frequency from the intervention phase to coaching phase was observed, suggesting that coaching did not significantly affect parent strategy use beyond the changes resulting from parent training alone. However, frequency of individual strategy use within the individual dysregulating scenarios that made up each data collection session was more variable. A functional relationship was not observed between delivery of the evidence-based training techniques and parent-reported generalization of strategy use in either case study. A significant change ($p < .05$) in parent-reported child emotional reactivity from pre- to post-intervention as measured by the EDI was reported in both cases, but supplemental observational data of child verbal and physical distress during data collection scenarios was variable. Changes in parent stress as measured by the Mood, Adaptability, and Competence subscales of the PSI-4 were not significant across study phases for either case study. The parents in both case studies rated the RELACS intervention as acceptable and effective (average scores of “4 – Agree” or higher on the BIRS Likert scale). The APFAFR was used to measure acceptability of the telehealth-delivery aspect of the intervention; the average rating on this measure for both case studies fell between “Agree” and “Strongly Agree” on the Likert scale. Further discussion of these results in relation to the previous literature is provided below, followed by a discussion of limitations and implications for future research and practice.

Parent Strategy Use

Parent-mediated intervention for youth with ASD has been recognized as both an established intervention by Phase II of the National Standards project and an effective means of increasing and generalizing a number of skills that improve social, communication, and adaptive

functioning (National Autism Center, 2015, Matson et al., 2009). A meta-analysis of parent training programs found that parent skill practice and emotional communication were also significantly associated with larger study effects (Kaminski et al., 2008). It is important to note that while many studies on this topic have demonstrated positive effects on child functioning, significant implementation factors have been identified that limit how effectively these interventions can be applied in natural settings, including a lack of implementation feedback given to parents and low parent or therapist treatment proficiency (Bibby et al., 2002; Mudford et al., 2001; Smith et al., 2000).

Change in parent strategy use following parent training. Delivery of the evidence-based training techniques resulted in a positive change in overall frequency of parent strategy use from baseline to intervention for both case studies. Data were stable with no significant outliers in both cases. A change in level (from moderate to high) was observed from the baseline to intervention phase for Case Study A and a change in level (from low to moderate) was observed from the baseline to intervention phase for Case Study B. A gradual accelerating trend across all study phases was also present for both cases. This finding provides preliminary support to the growing body of literature that suggests parent-mediated intervention can result in positive changes in parenting practices and behaviors (Stadnick et al., 2015). In addition, this study is among the first to study evidence-based training techniques with ER as the intervention target; in other parent-mediated interventions for ASD, ER is seldom taught or addressed with parents.

While the overall change observed in the total parent strategy frequency data is promising, it should be noted the intervention's effect on the frequency of verbal prompting, encouragement, and redirecting/distracting separately across dysregulating scenarios was more variable. Case Study A (Emma and James) displayed a significant change from baseline to

intervention in overall frequency of use for verbal prompting and encouragement, supported by both a change in level from the baseline to intervention phase in visual analyses and TauU calculations. Redirecting/distracting occurred at a low level throughout all study phases and significant change was not observed from baseline to intervention. When the data from each dysregulating scenario was analyzed separately, differences in parent strategy use were observed. During the parent-identified dysregulating scenario a level change in verbal prompting from the baseline to intervention phase was observed, but not in encouragement. The opposite occurred during the researcher developed dysregulating scenario; a level change in encouragement from the baseline to intervention phase was observed, but not in verbal prompting. For Case Study B, a significant change in overall level and frequency of verbal prompting from baseline to intervention was observed, but the change in frequency from baseline to intervention for encouragement and redirecting/distracting was not significant enough to provide unequivocal support of a functional relationship in their case. When analyzed separately, a level change in verbal prompting from the baseline to intervention phase was observed during the parent-identified scenario but not the researcher-developed scenario. The study data suggests that verbal prompting was the most frequently used strategy during the baseline phase for both studies, indicating that this strategy may have been the easiest to understand and implement for parents. It is also possible that the longer baseline phase experienced by Case Study B made it more likely for practice effects to be observed.

There are several potential explanations for these observed differences in parent strategy use across dysregulating scenarios. Both Emma and Katie may have modulated their strategy use based on the level of child distress caused by each dysregulating scenario. For example, in Case Study B the child Max displayed very little dysregulation after the baseline phase of the

researcher-developed dysregulating scenario, which may have affected how Katie used the strategies. Both parent-identified scenarios were also reportedly common occurrences in the families' homes, whereas the researcher-developed scenarios occurred less frequently in Emma's case and hardly ever in Katie's case. This lack of regularity may explain the overall lower rates of strategy use in the researcher-developed versus parent-identified tasks. In addition, there is some qualitative evidence that some strategies may have resonated differently with each parent. Emma reported during RELACS Session 4 that she hadn't realized how little encouragement she provides James when he is dysregulated and identified using more encouragement as a goal for herself. While prompting remained her highest-frequency strategy, Emma's overall use of encouragement significantly increased from baseline to intervention. Katie, on the other hand, noted during one intervention session that she felt Max may benefit from even more prompting to support him in making choices when he becomes dysregulated. These individual differences in perceived utility of the strategies may also explain why differences in strategy use were observed. Mutual exclusivity may have also played a role in parent strategy frequency. Parents only had six minutes per data collection, therefore limiting the number of strategies that could be used. In addition, time spent using one strategy could not be spent on other strategies, likely leading to situations in which one or two strategies could not be used as often as another. To combat this limitation, future studies could set a frequency goal for strategy use during each data collection session to determine whether parents can meet this goal after receiving intervention and/or coaching.

The difference in ER support provided by each strategy may also have influenced parent use. It should be noted that both parents were provided with information about the difference between higher and lower support ER strategies during the RELACS intervention, as each

strategy taught by the interventionist was accompanied by an explanation of what level of support each strategy entailed. It is possible that the change redirecting/distracting frequency was not significant from baseline to intervention for either case because the parents were relying more heavily on increased verbal prompting and encouragement (to a lesser degree than verbal prompting) to promote their child's regulation. This higher overall frequency in verbal prompting and lower frequency of encouragement is consistent with Ting and Weiss' (2017) observation that prompting was the most observed co-regulation strategy and reassurance (which included encouragement) was one of the least observed in their sample of parents with young children with ASD. It should be noted that while encouragement frequency was lower overall than verbal prompting and change in encouragement frequency was less frequently significant across cases, nonsignificant increases were still observed. While not statistically significant, these increases in encouragement may still have had clinical implications (such as increased warmth and support in the parent-child interaction). Finally, verbal prompting and encouragement are both higher-order ER strategies than redirecting/distracting, and the parents may have been trying to use the higher order strategies more frequently to promote independent emotion regulation.

Change in parent strategy use following coaching. Coaching was included in the current study as an add-on to the original RELACS intervention given a review of the literature indicating that coaching was identified as both an effective and essential component of several studies focused on training parents of young children with autism to implement strategies in the home (Goldstein & Naglieri, 2009; Meadan et al., 2016). Unfortunately, the utility of adding a coaching component to the intervention sessions remains unclear based on the results of these two case studies. A significant increase in parent strategy use from the intervention to coaching

phase was not observed in either case study. However, it should be noted that method of therapist treatment delivery and parent practice had to be altered due to the study's adaptation to telehealth-delivery in response to the COVID-19 pandemic. While interventionist's intervention treatment fidelity did remain high, the way in which feedback was delivered to parents and how the skills could be demonstrated to parents by the interventionist had to be altered because the interventionist was not physically present. In addition, the coaching data could have been related to a timing effect, as data collection for each coaching session took place the week following a coaching session. This delayed data collection could have disguised the effects of coaching. Future studies should consider having data collection take place immediately following each coaching session to address this potential threat to instrumentation. Research exploring the effectiveness of telehealth-delivered, evidence-based teaching strategies used to train parents of children with ASD in social and emotional intervention is limited and emerging (Esposito et al., 2020). However, there is some evidence that parent coaching results in increased frequency and better-quality parent naturalistic teaching strategy use when compared to parent training alone (Meadan et al., 2016). Perhaps providing coaching in natural settings/scenarios outside of the identified dysregulating scenarios would have resulted in more generalized and increased implementation of RELACS strategies. In situ training, which involves coaching or practicing a skill in the natural environment, has been found to be an essential component to generalizing skills taught via Behavioral skills training (BST; Hassan et al., 2018). This adaptation of RELACS may also have influenced how well the parents were able to learn the skills from the interventionist, as there is literature to suggest that adult learners tend to benefit from hands-on experience to a greater degree than instruction (Merriam, 2001).

The consistently high parent-reported strategy use and lack of change observed in this data across study phases is another important thing to consider within the greater context of current study findings. Parent confidence has been found to significantly predict parent-reported treatment adherence in a sample of parents of children with ASD (Moore & Symons, 2011). With this extant literature in mind, it is possible that Emma and Katie's perception of parenting competence influenced their perception of strategy use and application outside of session, given that parent report of strategy use was coupled with high reports of parenting competence on the PSI-4 for both cases. It is also possible that Emma and Katie interpreted the definitions of each strategy on the survey through the lens of their own personal parenting practices, thus perceiving each strategy differently from the way the interventionist intended in the survey.

Parent Stress

It was found that the intervention did not significantly reduce parent stress as measured by the Mood, Adaptability, and Competence subscales of the PSI-4 in either case study. Several environmental factors may have played a role in the insignificance of these results (see section below on social and environmental context). However, it should be noted that in both cases, parent stress was low at pre-intervention and remained low throughout all study phases, which is much less clinically concerning than if high parent stress were observed and remained unchanged across all study phases. It is also likely that the current study's stress measure did not capture the moments of acute stress in response to child distress observed by the interventionist during intervention and data collection sessions, as the PSI-4 was designed to measure overall stress in the parent-child system (Abidin, 2012). While high overall stress rates were not endorsed, this acute stress likely impeded parent strategy use in the moment at times. For example, during one dysregulating scenario Max attempted to crawl into the small space between

the couch and the wall, causing Katie momentary stress about the potential of him becoming stuck; this moment of acute stress quickly subsided when Max stopped his attempt to crawl into the space. Therefore, it is recommended that future studies on the RELACS intervention incorporate a stress-management or mindfulness-based component to more strategically address acute stress reduction in parents of preschoolers with emotion regulation challenges. In addition, there is not currently a standardized method for measuring acute parent stress (without monitoring changes in cortisol levels) that results directly from instances of emotion dysregulation, which future studies on parent-mediated intervention for emotion dysregulation may greatly benefit from.

Child Emotion Regulation

Though the primary study variable was parent strategy use, it was important to explore whether parent-perceived or observable changes in child dysregulation occurred as a result of intervention delivery. Adaptive child ER is associated with increased prosocial engagement and decreased risk of poor social and mental health outcomes for children with ASD (Jahromi et al., 2013; Mazefsky & White, 2014). In the current study, a significant change in emotional reactivity as measured by the Reactivity scale of the Emotion Dysregulation Inventory (Mazefsky et al., 2018b) was found from pre- to post-intervention for both Case Study A and Case Study B, as well as from pre-intervention to follow up. Though these findings are from a small-scale, multiple-case study, it should still be noted that the reported positive change in child emotion regulation is significantly higher than what has been reported in studies examining the ER of older children with ASD via questionnaire data (Scarpa & Reyes, 2011). However, it should be noted that this measure has not yet been validated for the preschool age group within the ASD population, observed child distress varied across cases and contexts during

observational assessments. For example, while Max's (Case Study B) highest rates of distress occurred during baseline, overall frequency of distress remained similar across all study phases. In Case Study A, James' overall observed distress was high in the baseline phase, stable and low during the intervention phase, and gradually accelerating in the coaching phase (with a high frequency of distress occurring during the final coaching session due to circumstances outside of the data collection scenarios). These findings suggest that while emotion dysregulation was variable during contrived study scenarios, parent perception of overall child emotional reactivity changed significantly. This could be due to several factors. First, the EDI results may have been more reflective of observed change in ER outside of data collection sessions. Second, there was some evidence that the researcher-identified scenarios were not as effective in eliciting child dysregulation as the parent-identified scenarios. The decision to use the researcher-identified scenarios in addition to the parent-identified scenarios was made in an effort to balance the limitations of the researcher-identified scenarios used in the RELACS pilot study with standardization. Finally, parent reported changes in emotional reactivity may also be explained by the notion that RELACS provided both cases access to a service related to supporting parents, which has been identified as a need by parents raising a child with ASD (Cassidy et al., 2008). In other words, provision of a service designed to provide parents with support and training in child ER development may have influenced parent perception of and responses to child emotional reactivity during daily interactions.

These findings are consistent with the pilot RELACS study, in which there was an overall lack of consistency in parent strategy use observed but parents reported feeling that their child became more regulated as the intervention progressed. One possible explanation for these findings is that something unrelated to parent use of ER strategies within the RELACS

intervention could be the catalyst for change in child ER. For example, parent emotion talk and/or parent recognition of how their own emotional responses model ER for their children are both topics covered in RELACS that were not quantifiably measured in either study. While the research is limited, there are studies that suggest maternal emotional support, talk, and emotion modeling lead to increased adaptive child ER (Racine et al., 2007; Supplee et al., 2004).

Treatment Acceptability

Both cases in this study found the intervention and the telehealth-delivery of the intervention to be acceptable and feasible, as measured by the BIRS and Adapted Performance Feedback and Acceptability Rating (Elliot & Treuting, 1991; Machalicek, 2008). However, Katie and Emma did report lower ratings for certain items that should be addressed. For example, Katie only slightly agreed that Max's emotion management difficulties were severe enough to warrant the use of this intervention; this rating is substantiated by her EDI data, which was only one point higher than the exclusionary cutoff score at pre-intervention. It could be that Katie did not perceive Max's ER as a larger issue than his challenges with other skills, such as speech and toileting. Emotion regulation is rarely identified as a core focus within ASD treatment for young children, as evidenced by the limited research in this area when compared to behavioral, speech, and social skill interventions (Sofronoff et al., 2014). In addition, Katie only slightly agreed that the interventionist's delivery of constructive feedback was acceptable to her, which aligned with her follow-up interview feedback that receiving visual feedback (in the form of notes after session) would have been helpful in processing feedback. In Emma's case, she disagreed that the intervention improved James' behavior to the point that it does not noticeably deviate from the behavior of his peers and slightly disagreed that the program had produced enough change that dysregulation was no longer a problem at home. Given that 1) Emma's EDI ratings were in the

higher range and 2) research findings indicate that ER is a much greater challenge for preschool-aged children with ASD than their peers (Jahromi et al., 2012), these item ratings are not altogether surprising. These findings provide further preliminary support for the acceptability and feasibility of delivering parent-mediated interventions via telehealth, an emerging area of the current research literature (Ingersoll et al., 2016; Machalicek et al., 2016). However, it should be noted that average acceptability ratings on the BIRS were slightly higher than effectiveness ratings for both cases, suggesting that parents felt less strongly about the effectiveness/change produced by the intervention than acceptability of the intervention itself. This pattern was also present in the pilot study of the RELACS intervention (Rispoli et al., 2019). These findings warrant further exploration of elements that may influence child behavior change, such as direct child instruction or discrete-trial training of some of the skills being taught, particularly in light of the fact that other studies on ER intervention with young children with ASD tend to rely on parent psychoeducation and coaching to teach parents intervention skills (Scarpa & Reyes, 2011; Wilson et al., 2013). Perhaps these elements could be incorporated into future iterations of RELACS to increase effects, such as teaching parents how to teach children to recognize and label emotional states via discrete-trial training.

Regarding telehealth delivery specifically, both case studies indicated that telehealth was practical and that they would recommend telehealth to other parents. There were some individual differences in parent perception of telehealth intervention delivery that are worth noting. Case Study A strongly agreed and Case Study B slightly agreed that technical aspects of telehealth (clear sound/picture, etc.) were effective, indicating a potential difference in technical effectiveness perceived by each case. Case Study B did experience slightly more technical

difficulties throughout intervention. This suggests that telehealth acceptability may be influenced by individual differences in internet connectivity.

Treatment Fidelity

For researchers and practitioners to draw sound conclusions regarding treatment effectiveness, it is important for treatment integrity to be assessed (Hagermoser Sanetti et al., 2011). According to Perepletchikova and Kazdin (2005), treatment adherence must be 80% or higher to be considered adequate. Interventionist treatment fidelity ranged from 100% for Case Study A to 92%-100% (average = 97.9%) for Case Study B. This high range of treatment fidelity is particularly notable considering that the current study was the first to adapt the RELACS intervention to be delivered via telehealth. The high treatment adherence in the current study provides further preliminary support to the notion that parent-mediated intervention can be delivered with fidelity via telehealth (Hao et al., 2020; Ingersoll et al., 2013).

Limitations

Reliability and validity of observational measures. Inconsistent inter-rater reliability was a notable limitation in the current study. Instead of coding a randomized 30% of data collection sessions, the decision was made to consensus code all data collection sessions and use the consensus codes to conduct all visual analysis and TauU calculation. There are several factors that likely contributed to inconsistent inter-rater reliability in the current study. Inter-observer agreement is often calculated based on percent occurrence and non-occurrence within an interval coding scheme (Rocha et. al., 2007). In the current study, inter-observer agreement was calculated based on occurrence in the context of a frequency coding scheme; the absence of non-occurrence agreement coupled with the lowest frequency of strategy use in some scenarios made it so that even slight differences in frequency between observers resulted in a very low

percentage of inter-observer agreement (i.e., 0% agreement when the frequency of a code was 1 or 2). In addition, it is likely that the delayed and adapted study timeline contributed to observer drift between coding batches. Thus, consensus codes were used for visual analyses to control for instrumentation threats to validity, which are a common concern in single-case studies because repeated measurement by human observers may result in errors (Gast & Ledford, 2014). Future studies using a coding scheme similar to the one employed by the current study should consider calculating IRR based on a partial-interval coding system, particularly for low-frequency strategy use, as it may more accurately capture inter-coder agreement on the presence and absence of codes.

Small study sample and adapted research design. Recruitment limitations led to the decision to adapt the current study into a multiple-case rather than multiple baseline design study, with results that are not able to be generalized in the same way as a rigorous single-case research design with multiple demonstrations of effect. As a result, this study did not meet the rigorous single-case research design standards set forth by Kratochwill and colleagues (2013). Multiple case studies have more threats to internal validity and limited demonstrations of effect. It should be noted that the adapted study design was not able to control for maturation, testing, and instrumentation threats to internal validity in the way that the original design intended. History and maturation were likely the most significant threats to internal validity present in the current study. The study began when COVID-19 restrictions were at their highest and concluded when many bans on social gatherings had been lifted and many individuals began to have access to the vaccine. As a result, parents may have felt less stressed over time and more equipped to manage the demands of supporting their child's ER. In addition, maturation could have occurred as children aged and were exposed to the same dysregulating scenarios repeatedly throughout

data collection sessions. It should also be noted that the children's reactivity to the scenarios may have changed over time if they became aware of what was being asked of them every time they engaged in the dysregulating scenarios. There was some anecdotal evidence supporting this possibility. For example, Katie reported that Max enjoyed having the same "task schedule" each week and knew what the dysregulating scenario and play sequence consisted of. Recruitment limitations resulted in a longer period between study recruitment and participation than anticipated. Case Study A and B responded to the same dysregulating scenarios repeatedly throughout intervention, which may have resulted in practice effects for both child distress and parent strategy use. The instrumentation threat to internal validity is described in greater detail in the section above. While these threats to internal validity would have also been present in the original study design, the larger sample size and increased potential demonstrations of effect would have controlled for these threats to a greater degree (Gast & Ledford, 2014).

Technology and internet stability challenges. The current study took place entirely via HIPAA-compliant Zoom teleconferencing technology, and there were some challenges experienced with internet speed and stability throughout the intervention, particularly in the case of Katie and Max (Case Study B). While telehealth-delivery was immensely helpful in terms of allowing for safe research participation during a global pandemic, there were several instances in which internet connectivity may have interfered with the quality of engagement and feedback. To counteract this problem, internet connectivity and strength were tested prior to engagement in the first data collection session with both cases. However, occasional connectivity issues (such as video lagging behind audio and temporary pauses from connectivity issues) were still present throughout the intervention process. While the extant literature on technology challenges experiences during telehealth-delivered interventions is limited, findings from the current study

suggest that future studies may want to consider several internet connectivity and strength checks prior to intervention engagement or provide each family with a plug-in Wi-Fi booster to be used in the room of the home where the intervention takes place.

Social and environmental context. The onset and duration of the global COVID-19 pandemic had a tremendous effect on all aspects of the current study, and likely contributed to some of the results obtained. While reported parent stress on the PSI-4 for were low at pre-intervention, post-intervention, and follow-up for both cases, this measure may not have adequately captured the high level of collective stress resulting from the pandemic. In addition, while parent-reported use of strategies in the home outside of sessions were high, there were likely fewer opportunities for parents to apply the strategies learned from the intervention outside of the home environment, as the pandemic resulted in limitations being placed on public gatherings and spaces. Finally, limited social contact outside of the household made it more difficult in both cases for the parents to be able to engage in intervention sessions uninterrupted by small children and other household distractions that may have normally been taken care of by a babysitter, grandparent, or friend.

Implications for Research

While effective ER has been connected to less severe social impairment and ASD symptomology in youth with ASD (Goldsmith & Kelley, 2018), research pertaining to how to promote and support ER skill development within this population is emerging and limited. The findings from the current study build upon previous investigations into parent-mediated intervention delivered via telehealth (Hao et al., 2020; Ingersoll et al., 2016). Additional research exploring RELACS' effectiveness is necessary to further examine the relationship between training methodology and parent implementation of intervention strategies. Being able to

determine the effectiveness of each individual evidence-based training technique used in the current study may provide researchers with valuable information pertaining to what components, if any, of the training methodology influence parent implementation of RELACS strategies. In particular, the utility of coaching as a training component within the RELACS intervention was unclear in the current study. However, utilizing coaching with a larger sample of intervention participants is warranted given the extant literature suggesting the effectiveness and necessity of coaching in parent management training (Goldstein & Naglieri, 2009; Meadan et al., 2016). It may also be useful to determine whether or not the training methodology utilized in the current study would be effective in a group setting, in which caregivers would have the opportunity to further practice implementation with other caregivers. Determining the efficacy of delivering RELACS in a group format would be an important step toward larger dissemination of parent-mediated ER intervention.

Further, while the emphasis of the current study was caregiver skill training, the current study did not monitor parent implementation of strategy use outside of data collection sessions beyond parent self-report. Further research on strategy use during specific, uncontrived dysregulating scenarios may provide important information pertaining to how these skills are being generalized outside of data collection. While this was the first study to examine whether parent training methodology influences parent use of strategies to promote and support ER in young children with ASD, the current case study can only provide preliminary evidence of how the parent strategy use may shape and influence child ER. Therefore, future research more closely examining the relationship between RELACS delivery and child emotional responses and behavior change is warranted.

Additionally, further refinement and standardization of observational codes used to identify parent strategy use and child distress would likely contribute greatly to how these important parent and child behaviors could be examined and analyzed; this sentiment is also expressed in the greater extant literature (Hirschler-Guttenberg et al., 2014). The audio and video quality of Zoom recordings was lower than that afforded by professional video equipment, which at times may have interfered with identification of codes. Inferring the intent behind verbal language (i.e., whether parent language that met the operational definition of a prompt was meant by the parent to be a prompt in context) can also be a challenge and is not always reliable, and may have also played a role during coding. In addition, there were times in which verbal prompts were given by a parent while they were redirecting or distracting their child, which did not fall under the operational definition of verbal prompting (which needed to assist the child with completion of the identified dysregulating scenario) but nonetheless was at times mistakenly identified as a verbal prompt. Furthermore, the development of a measure to examine quality of strategy use may also provide richer data on study effects; it was found in the current study that data collection measures did not adequately capture the change in quality of some strategies used by parents (i.e., the difference between providing a verbal prompt of “Look at this!” versus “Please come sit calmly next to mama”). These improvements made and used in combination with newly developed quantitative measures of emotion dysregulation (such as the EDI; Mazefsky et al., 2018) will allow for more precise data collection and interpretation in future emotion regulation studies.

Implications for Practice

The results of this study may be used in combination with the extant literature to inform the clinical practice of providing parent-mediated intervention or parent management training

services to young children with ASD that struggle with emotion regulation. This study provides preliminary support for the potential acceptability and feasibility of delivering this ER intervention via telehealth with high interventionist treatment adherence as in other similar studies (Hao et al., 2020; Ingersoll et al, 2016). These findings, when coupled with the extant literature, provide valuable information to practitioners who are wondering how best to support ER in young children with ASD. For example, this intervention took place entirely via telehealth, showing that parent-mediated ER intervention can take place in family homes without the physical presence of an interventionist. Follow-up interview data suggested that parents found receiving coaching and feedback from a trained interventionist during play and dysregulating scenarios with their child helpful, suggesting that the addition of these components could provide further ER support to children and families working with practitioners both in-person and via telehealth.

The author of this manuscript also provided RELACS via telehealth with high treatment adherence (range: 92%-100%). While there is a need for further research specifically targeting treatment integrity for this intervention, treatment fidelity is an integral component of treatment effectiveness (Hagermoser Sanetti et al., 2011). Maintaining high treatment integrity is a common concern raised by researchers and practitioners alike regarding telehealth intervention delivery (Rodriguez, 2020).

Telehealth intervention delivery also has the added benefit of observing child dysregulation and parent responses in the home environment, which can help better address the real-life ER challenges faced by families day-to-day. A higher frequency of strategy use was observed for both parents in the current study during the parent-identified dysregulating scenario, suggesting that parents may be more likely to implement practitioner-suggested ER strategies

when they can be directly applied to a scenario that commonly occurs in their household throughout intervention. The ability to engage in implementation in a natural setting while interacting with a practitioner via telehealth may also lead to enriched opportunities for skill application and development in contexts that are common for the family.

Adaptive emotion regulation is an essential component of child social-emotional development, and the preschool age marks an important developmental shift towards independence in this area. Parents play an essential role in facilitating this shift; for example, Supplee and colleagues (2004) found that provision of child-directed maternal emotional support during early childhood significantly predicted ER and academic outcomes upon school entry. Maternal emotion coaching has also been found to mediate the relationship between family risk (i.e., low socioeconomic status, family stress) and child emotional lability in preschool (Ellis et al., 2014). The research on ER intervention for young children with ASD outside of the RELACS intervention is limited, consisting largely of modified CBT, parent psychoeducation, and in-vivo/video modeling to address emotional lability and affective responding (Gena et al., 2005; Scarpa & Reyes, 2011). While findings pertaining to frequency of parent strategy use were variable in the current study, some positive and significant changes in parent strategy use were observed and coupled with notable decreases in parent-reported child emotional reactivity. This also study adds to the extant literature by exploring how this important area of social-emotional development can be supported by parents of children with ASD, which is valuable in the larger context of how social-emotional development can be fostered by providers working with parents in the context of school, mental health, and community settings. While further research is needed to refine and understand the efficacy of the brief RELACS and parent coaching intervention, the current study can be viewed as a step towards determining whether this intervention could be

feasibly and acceptably implemented with integrity in a school-based, mental health, or community setting.

APPENDICES

APPENDIX A

Study Recruitment Screener

Parent Name: _____

Age: _____

Primary Language: _____

Child Name: _____

Age: _____

Verbal? Y N

Primary Language: _____

Formal clinical or educational ASD diagnosis? Y N

4+ weeks of emotionally dysregulated behavior? Y N

Phone Number: _____

E-mail: _____

Address: _____

APPENDIX B

RELACS Strategy and Distress Coding Sheet

ID: _____ Session: _____ Date: _____ P-I or R-I

RELACS Strategy and Distress Coding Sheet

PARENT CODES	Frequency Count	Total
VENC		
VREDI		
VP		
CHILD Codes	Frequency Count	Total
PD		
VD		

APPENDIX C

RELACS Parent Strategy Use Checklist

<i>Please indicate how often you have used the strategies from this intervention in the past week by circling the appropriate number next to each strategy:</i>				
1. Engaging in interactive play with your child	0 None	1 Rarely	2 Occasionally	3 Frequently
2. Identifying your own emotion(s) for your child	0 None	1 Rarely	2 Occasionally	3 Frequently
3. Encouraging your child using words and/or actions	0 None	1 Rarely	2 Occasionally	3 Frequently
4. Prompting your child with actions to help him/her manage emotions	0 None	1 Rarely	2 Occasionally	3 Frequently
5. Using words to redirect or distract your child	0 None	1 Rarely	2 Occasionally	3 Frequently
6. Verbally comforting your child when he/she is dysregulated	0 None	1 Rarely	2 Occasionally	3 Frequently
7. Identifying your child's emotion(s) for the child	0 None	1 Rarely	2 Occasionally	3 Frequently
8. Modeling your own emotion regulation	0	1	2	3

	None	Rarely	Occasionally	Frequently
9. Prompting your child with words to help him/her manage emotions	0 None	1 Rarely	2 Occasionally	3 Frequently
10. Physically comforting your child when he/she is dysregulated	0 None	1 Rarely	2 Occasionally	3 Frequently

Approximately how many times per day did you use an intervention strategy this week? _____

APPENDIX D

Acceptability Measures

BIRS-P Adapted

The following statements ask about your reaction to the RELACS program. Please evaluate the program by checking the box that best describes your agreement or disagreement with each statement. *The phrase “most parents” refers to most parents of children with Autism Spectrum Disorder.*

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Disagree Just a Little Bit</i>	<i>Agree Just a Little Bit</i>	<i>Agree</i>	<i>Strongly Agree</i>
1. This program was an acceptable way to learn about helping my child manage emotion.						
2. Most parents would think this program was a good way to learn about helping children manage emotion.						
3. The program was effective in improving my parenting skills and helping support my child’s emotion.						
4. I would suggest that other parents participate in this program.						

5. My child's difficulties with managing emotion were severe enough to warrant use of this program.						
6. Most parents would find this program suitable for addressing dysregulated emotion in children.						
7. I would be willing to participate in a program like this again.						
8. Participating in the program did not result in negative side-effects for my child.						
9. The program would be appropriate for a variety of children with Autism Spectrum Disorder.						
10. The parenting skills taught in the program are consistent with those I have used before.						
11. This program was a fair way to learn how to support my child's emotion regulation.						
12. This program was reasonable for learning to support emotion regulation in my child.						
13. I liked the procedures used in this program.						

14. This program was a good way to handle dysregulated emotion.						
15. Overall, the program was beneficial for my child.						
16. The intervention quickly improved my child's behavior.						
17. The intervention produced a lasting improvement in my child's emotional regulation.						
18. The intervention has improved my child's emotion regulation behavior to the point that it does not noticeably deviate from peers' emotion regulation behavior.						
19. Soon after using the intervention, I noticed a positive change in my child's behavior.						
20. My child's behavior will remain at an improved level even after the program is discontinued.						
21. Using the program has improved my child's behavior in the home, but also in other settings (e.g., community, school)						

22. When comparing my child with an emotionally-regulated peer before and after use of the program, my child's and the peer's ability to manage emotion is more alike after using the program.						
23. The program has produced enough improvement in my child's behavior that emotional dysregulation is no longer a problem at home.						
24. Other behaviors related to emotional dysregulation have also been improved by the program.						

Adapted Performance Feedback Acceptability and Feasibility Rating (Machalicek, 2008)

Instructions: After reading each of the following statements, indicate a numerical rating that best describes your agreement with the statement. There are no right or wrong answers.

	1 <i>Strongly Disagree</i>	2 <i>Disagree</i>	3 <i>Slightly Disagree</i>	4 <i>Slightly Agree</i>	5 <i>Agree</i>	6 <i>Strongly Agree</i>
1. Implementing new skills learned via the telehealth process (i.e., Zoom) was not too difficult.						
2. This telehealth process has helped to clarify how to implement strategies to address the concerns I had for my child.						
3. I would recommend telehealth to other parents.						
4. Telehealth was practical.						
5. The telehealth intervention I received has strengthened my skills in addressing the concerns I had for my child.						
6. Efforts made by the interventionist to reinforce my attempts at using the skills						

and after completing data collection activities were acceptable to me.						
7. The interventionist's delivery of constructive feedback was acceptable to me.						
8. My child has benefitted from this telehealth intervention.						
9. I think that telehealth is an appropriate way to teach strategies to address child social/emotional/behavioral concerns.						
10. This model of telehealth would be helpful in teaching parents to implement other strategies to address child social/emotional/behavioral concerns.						
11. I feel confident in my ability to implement the strategies I learned through this telehealth intervention process with my child.						
12. Other parents should participate in this model of telehealth.						

13. The technical aspects of video telehealth were effective (e.g., clear picture and sound, speed of transmission, etc.).						
14. Setting up the equipment for telehealth sessions was feasible.						

Telehealth Qualitative Survey

1. What have you liked about participating in this intervention via telehealth?
2. What has been challenging about participating in this intervention via telehealth/Zoom?
3. If health and safety were not a concern, would you prefer to participate in this intervention via telehealth or in-person? Why?

What do you think could be done to improve this telehealth intervention process for future parents who participate?

APPENDIX E

Post-Intervention Feasibility Parent Interview

The following semi-structured interview will be conducted with all parent participants following participation in the RELACS intervention. It is expected that each interview will be 30 to 45 minutes in duration. Interviews will be conducted in person or over the phone, and audio recorded for later analysis.

1. What did you experience from participating in the RELACS intervention?

Probe 1: What did you learn from participating in RELACS?

Probe 2: What strategies were most effective in helping you support your child's emotion regulation skills?

Probe 3: How did your experience compare to what you expected when you agreed to participate in the study?

2. What did your child experience from participating in RELACS?

Probe: Were there any changes in your child's behavior?

3. In what ways could RELACS be improved to make it more effective?

Probe 1: How could RELACS be improved to help you learn skills to support your child's emotion regulation skills?

Probe 2: How could RELACS be improved to help your child learn skills to manage their emotions?

4. How does the RELACS intervention compare to other interventions and services your child has or is currently receiving? That is, how is it alike or different?

Probe 1: How does RELACS compare to other interventions that you've used with your child, such as PECS, prompting language, supporting behavior?

Probe 2: How does RELACS compare to other services that your child has or currently receives, such as early intervention, speech therapy, or Applied Behavioral Analysis (ABA)?

5. If the RELACS intervention was available to all families with young children who have been diagnosed with ASD, when and how would you have liked to hear about RELACS?

Probe 1: When in relation to receiving the diagnosis of ASD for your child?

Probe 2: In what ways would you have liked to hear about RELACS, such as a website, your child's doctor, your child's teacher, etc.?

Questions adapted from Hodgson et al. (2016); Pickard et al. (2016); Stadnick et al. (2013)

APPENDIX F

Researcher Repertoire of Frustration Tasks

Researcher-Identified Frustration Task Types and Associated Activities

Frustration Task Type	Frustration Tasks	Task Descriptions
Impossible/Challenge	Toy in transparent box	Child plays with preferred toy, then toy is then locked in clear box. Child given incorrect key to open box.
	Unsolvable puzzles	Child attempts to solve unsolvable puzzles before being given a solvable puzzle.
Non-preferred	Pick-up paradigm	Child and mother play with preferred toys, then child is instructed to stop playing and put toys away.
	Toy removal	Child presented with attractive toy and plays, then toy is placed in an unreachable but visible location.

	Disappointing toy	Child “wins” prize in simple game but prize is a disappointing toy. Child allotted time to play with toy.
	Video interruption	Child watches video on tablet and is then told battery has died and must wait before resuming video.
Disruptive/Fear	Masks	Interventionist wears a series of increasingly realistic and potentially fear-inducing animal masks while child watches.
	Hungry crocodile	Child plays with toys until interventionist arrives with crocodile puppet that takes away child’s toys.

APPENDIX G

RELACS Procedure Sessions 1-4 (Rispoli et al., 2019)

Session 1: Introduction to Emotion Regulation

****Videotape the dysregulating scenario after session****

***NOTE:** All parent practice scenarios will be done via a bug-in-the-ear technique (i.e., the researcher will call the parent's cell phone and give them directions/prompts while the parent listens via headphones).*

Focus/goal: You will help the parent arrange her home to encourage interaction during play, educate the parent on how to label the child's actions, follow the child's lead, and foster interaction by intentionally "involving" herself in the child's activities.

Materials needed:

1. Clear boxes in a variety of different sizes
2. Toys that may be of interest to the child

Parent education: (10-15 minutes)

In this intervention, we will focus on your ability to support your child's emotion regulation skills. Emotion regulation is a skill that is very important in all aspects of your child's life. When we say emotion regulation, we mean your child's ability to increase, maintain, or decrease the intensity of his emotional expression in order to meet the demands of a given situation. For instance, a child who is angry because his sister took his toy that loudly screams, pushes his sister, and grabs the toy is not exhibiting good emotion regulation. In contrast, a child who calmly says, "No, that's my toy. Please give it back" in response to his sister taking his toy, even

though he is just as upset about the toy as in the other example, has learned good emotion regulation.

There are also times when positive emotion can be dysregulated. For instance, the child who is running excitedly around the preschool room while making repetitive noises because the teacher is about to read a story about his favorite character, Elmo, is not regulating his emotions. In contrast, the child who excitedly claps his hands and says, “Yeah, Elmo!” while remaining seated on the carpet is regulating his emotions. In short, emotion regulation allows children (and adults) to be able to fully participate in activities and accomplish tasks, even when the level of emotion they are experiencing is strong.

What are some examples of times that your child has had difficulty regulating his emotions?

[This activity is meant to build rapport between the interventionist and parent, and also allow the interventionist to gain information about the nature of the child’s regulatory difficulties.

After discussing these examples for 2-3 minutes, transition to the next portion of this lesson.]

Thanks for sharing those examples. They really help me to get to know your child better, and will help me to think of ways that we can make the strategies we’ll talk about in this intervention work even better for your child. Now we’re going to talk about something a bit different – setting up your home to increase interaction between you and your child. While this topic might seem unrelated to emotion regulation, it is actually very important and will help prepare you to more easily use the strategies that we’ll talk about in the weeks to come.

As you probably know, children with autism often prefer to play on their own, and may play repetitively with objects in ways that make it hard for you, as their parent, to join in their play.

This is why it is important to learn how to arrange your child's play area to encourage interactions. In this lesson, we will talk about how you can "set up" opportunities for you and your child to interact, and how you can follow your child's lead to label the actions and emotions that they display during play.

When children with autism play, we can arrange objects and the way that objects are kept in his environment to encourage him to interact. You may have made similar changes to your environment if you have ever tried to encourage your child to use verbal language skills. We will make similar changes in this lesson, but the ultimate goal is to create opportunities for interactive play between you and your child, during which you will eventually be supporting his ability to manage emotion. Some examples of ways we might arrange the environment include:

- Moving preferred objects to high shelves that are within eye sight but out of reach of your child.
- Keeping preferred objects in clear containers with lids that require help to remove.
- Removing a preferred item/toy from the environment and waiting to see if your child requests it.

The second way we will make changes to the environment is to create opportunities for you to interject yourself into the child's play. You will do this by first practicing labeling the child's actions during play to show him that you are interested. You will then work to also play alongside your child, following his lead by imitating actions and eventually initiating interactive play.

When you have mastered this skill and your child feels comfortable playing with you for even short periods of time, you will begin to label his emotions during play, using simple language. You might say, "Playing with the ball makes you happy!" or, "You are sad that your blocks fell

down.” This is the first skill we will work to improve in your child – the ability to identify his emotions. Your labeling of his emotions will help him begin to connect words describing emotions to his actions and the way he is feeling inside.

Parent Practice with Feedback: (10-15 minutes)

Begin by asking the parent to identify what toys are most preferred by the child. If the child has few toys that are preferred, present toys from the RELACS toy kit to determine if any are of interest to the child.

Directions to give to parents: Give the child a few minutes to interact with all of the toys, and keep any that are of interest in the play area. Play alongside the child for a few minutes, and then work to join him in play. This will give the child a chance to begin feeling comfortable. After a few minutes, introduce the clear boxes and explain to the parent that they will be placing a few of the child’s preferred toys in the boxes to see what he does. While the child is occupied with something else, place a few of the preferred toys in different boxes. Keep the boxes within reach and eyesight. Wait and see what the child does. If he makes a request for a toy, make sure to respond to the request as soon as possible and then attempt to join the child in the play with this preferred toy. Continue this play for a few minutes.

After a few minutes, take one of the preferred toys and place it on a shelf/ledge/piece of furniture that is within eyesight but out of reach for the child. Stand near this location and wait to see if the child makes a request for the toy. If he does, respond promptly and again join the child in play.

At this point, give the child a few minutes to relax or play independently while you talk with the parent about how she may arrange the environment to encourage more interactive play. Some suggestions might include keeping more toys in boxes and making sure that toys that encourage interactive play (e.g., figurines, barn set, dolls, cars, train set, balls) are more readily available than solitary toys (e.g., light-up spinning toys, musical push-button toys, iPad app games).

After talking with the parents (approx. 5 minutes), direct the parent to join the child in play and begin labeling his actions to demonstrate how the parent can convey interest in the child's play.

Provide several examples of different ways the parent might label the child's actions while playing (e.g., say what the child is doing, talk "for" the character he is playing with). After a few minutes of play, begin labeling the child's affective state and have the parents do so as well.

Return to the boxes, and have parents place 1-2 toys in boxes. If this elicits a negative reaction, label the reaction in the child. Be sure he is granted access to the preferred toy after the parent labels the action to reduce distress. The focus is not on the child's ability to request (as would be the case for a language/social intervention). It is more important that the child begins to hear his emotions being labeled, and the parent hears this technique demonstrated.

Suggestions for practicing in everyday routines: (10 minutes)

Ask the parent what type of play activities they engage in with the child on a typical basis.

Assure them that it is okay if they do not regularly play in an interactive manner with the child.

Provide suggestions for ways that they may play interactively with the child using the toys that are available in the house.

Virtually walk through the child's typical play space(s) and talk with the parent about how the environment may be arranged to encourage more interaction. Identify where toys can be stored to encourage requests, how to increase availability of interactive toys, etc.

Goal development: (5 minutes)

Fill out ReLACS Goal Setting Worksheet with parent. Determine how parent will practice the strategies reviewed during today's session in everyday activities with the child.

Session 2: Identifying Children's Emotions

Citation: Palermo et al. (2006)

Review Week 1 strategies, answer parent questions (10 minutes)

****Videotape the dysregulating scenario after session****

Focus/Goal: The parent will begin to feel comfortable in their role as “emotion coach” for their child. They will recognize the importance of labeling emotions for their child by visually and verbally reflecting the child’s emotional states. The parent will also be taught how to promote emotion recognition in their child by engaging the child in a variety of game-like interactions.

Materials needed:

- Emotion cue cards (laminated on ring) – *place happy, sad, mad and more sophisticated emotions (e.g., surprised, angry) on ring but note more sophisticated emotions should be introduced when child has mastered labeling of simple emotions.*
- Emotion face magnets (set of 3)
- Dramatic scenario photos
- Dramatic scenario drawings
- Emotion memory game
- Animal puppets
- Squeaky dog toy

Parent education (script to inform parent):

Children with autism have difficulty with a skill called Theory of Mind. This means that it is often hard for a child with autism to look at another person and use nonverbal and verbal clues (such as a frowned face or a long sigh) to guess how that other person is feeling. They also struggle to recognize their own emotions and express how they are feeling using these same nonverbal and verbal cues. One primary way that children learn about emotion is to watch their parents’ experience emotion, talk about their emotions, and manage their emotions. Children learn to manage their own emotions by turning to their parents for support. Here is an example:

Abby is 4 years old. She is home playing with her mother, Gwen, when the smoke detector begins to beep to indicate low battery power. The sound is quite loud and frightens Abby, so she begins to cry. Abby, unsure of what is happening, runs to her mother with her arms outstretched. Gwen promptly scoops her up, saying, “The smoke detector is telling us to change its batteries. That sound scared you, and it’s hurting your ears. It’s ok, Mommy will change the batteries now and the sound will go away.” Abby stops crying and begins to cover her ears while she watches Gwen retrieve new batteries and replace them in the detector.

Children with autism have more difficulty seeking out this kind of emotional support from their parents because of their difficulties with social and communication skills. However, research in recent years has confirmed that children with autism do learn about how to manage their emotions from their parents. This happens through how parents express and manage their own emotions, as well as how they work to support emotion management in their children. As a parent of a child with autism, you will have to work harder to help your child understand, express, and manage his emotions than you would with a typically developing child. We think it is helpful if you think of yourself as your child’s “emotion coach” as you complete this program. In other words, you will have to work as intentionally on your child’s emotion management skills as you would on his basketball skills if you were the team coach. This intentional work will include modeling appropriate emotional identification and management for your child, and helping him to identify, express and regulate his emotions through verbal and visual prompts (end script).

Introduce materials: emotion cue cards, face magnets, photos, drawings (parents will have these materials sent to them in advance of the session as part of their RELACS kit). Demonstrate how you would label an emotion the child seemed to be experiencing using the cue cards and poster. Work with the parent to identify a central location for the magnets, so she can easily refer to them throughout the day. Mention that cue cards can be used at home and when in the community.

Parent Practice with Feedback: (10-15 minutes)

Have the parent engage the child in a play activity. Tell them to play with the child as you typically would for several minutes, until he seems comfortable. When he is engaged in play but not overly engrossed, bring out animal puppets and make them “talk” to the child. Direct the parents to use the cue cards to label his emotion. Have parents continue playing with animal puppets if they are interested, labeling emotions as the child expresses them.

When the child appears to lose interest in the puppets or more than 10 minutes has passed, have the parent redirect the child’s attention to his toys. Again, have the parent engage the child in play and wait until the child is too busy playing with a toy to notice what you are doing, but not overly engrossed. Have the parent quietly retrieve the squeaky toy and operate it a few feet away from the child. Direct the parent to label the child’s emotion when he turns his attention to the toy. If the child is scared, have the parent label the emotion and promptly remove the toy while assuring the child that it was just a loud noise and that it is all done.

If the puppet and loud toy scenarios did not elicit much emotion from the child, ask the parent to prompt the child to complete a task/activity that he typically resists. Once the prompt has been given and the child reacts, tell the parent to begin to label the child's emotions using verbal and visual (i.e., cue cards) tools. If the child refuses to comply and is markedly distressed (e.g., sobbing, screaming, destroying property), discontinue the activity after just a couple of minutes. Ask the parent to complete the task/activity for the child and/or allow the child to escape the situation (ex: "Ok, we'll clean up toys later.") to guard against any negative effects on the child or the parent. **If the child begins to engage in self-injurious behavior at any point during this activity, discontinue immediately and enact crisis plan.**

Finally, tell the parent to direct the child's attention to the photos and drawings. Use the following direct instruction procedure to practice emotional identification for the photos and sketches. In a field of 2, have the parent prompt the child to identify a particular emotion (e.g., "show me sad"). Use limited verbal language to reduce language processing demands. If the child is able to correctly identify the emotion in 5 consecutive trials, have the parent increase the field to 3 cards. After a few minutes, have the parent engage the child in an emotion match/memory game. The game may be played before the direct instruction of emotional expression cards if the child is particularly upset/dysregulated after the squeaky toy/non-preferred task.

Suggestions for practicing in everyday routines: (10 minutes)

Talk with parent about times when it may be feasible to engage the child in fun review of the emotions using emotion matching cards.

Help parent identify scenarios in which it may be helpful to cue the child to express his emotions using the emotion visual cue cards on a ring. Identify where the emotion smiley faces can be stuck in the house so that the parent can easily refer to them, and the child can easily access them.

Goal development: (5 minutes)

Fill out ReLACS Goal Setting Worksheet with parent. Determine how parent will practice the strategies reviewed during today's session in everyday activities with the child.

Session 3: Scaffolding Regulation I

Review Week 2 strategies, answer parent question (10 minutes)

****Videotape the dysregulating scenario after session****

Focus/Goal: Help the parent understand how her own emotion impacts that of her child's. The parent will learn to verbally describe her feelings and what she does to modulate her emotions for the child. The parent will also learn the impact that hostile and/or critical behaviors can have on the child's ability to manage his own emotions and behaviors. You and the parent will brainstorm ways to maintain modulated, calm behavior in the face of frustration.

You will also work with the parent and child to establish a list of tools, or strategies, that the child could use to calm down when feeling angry/anxious, or release energy when feeling overly excited.

Materials Needed:

- Toys to elicit play interactions
- Wooden block toys
- Hammer and mini tool bench

Parent Education (script to inform parent):

Being a parent of a child with autism is no easy job! Parents of all children experience stress and frustration, and you may feel like you experience even more due to the many demands you must meet for your child, yourself, and the rest of your family. Children, including children with autism, are influenced by the emotions their parents express, and how their parents manage those emotions. Psychologists call this “social learning” – children learn by watching their peers and other adults, and imitate the behaviors that they see. While children with autism commonly exhibit more difficulty learning in this way, research is telling us that their behavior is affected by the emotion that is expressed by their parents. Negative parental emotion in particular,

including hostility and criticism, seem to place children with autism at risk for having long-term behavioral difficulties.

Today we will talk about how you might model good emotion regulation skills for your child.

This will include labeling your own negative emotions and “talking through” how you will manage frustrating or upsetting situations when your child is present. Let’s start by thinking of a few examples of frustrating situations that have happened to you in the past two weeks (end script):

(Help parent brainstorm 2-3 examples of frustrating situations – you might suggest different scenarios to think about, such as at a restaurant, at the grocery store, when driving in the car, conflicts with spouse/other children in the home).

Once the parent has identified 2-3 examples, prompt them to describe how they responded to the frustration, including what behaviors or verbalizations they displayed in front of their child. If responses were negative/hostile, encourage them to think about how they might have responded in a more adaptive way. Remind them that these situations can be opportunities for the parent to teach the child how to reduce frustration and/or what emotions are appropriate in a given situation without directly “teaching” the skill.

Parent Practice with Feedback: (10-15 minutes)

Tell the parent to engage child in natural play interaction, or at least establish a “parallel play” scenario in which they are playing near the child. When the child appears engaged but not overly engrossed in what he is doing, tell the parent to begin to build a tall tower with the blocks. Tell the parent to keep building until they are certain the tower will fall down. When it falls, tell the parent to say “uh oh” or “oh no” or something similar to draw the child’s attention to the

scenario. Once the parent has the child's attention, tell them to say, "Oh, well. My tower fell down. That makes me mad, but I know I can just build it again. Ok, time to build!" Tell the parent to begin re-building the tower. If the child joins the parent in this play, continue the interaction for a few minutes. He may even wish to build a tower and watch it fall down. In that case, tell the parent to use the same kind of verbal modeling they did about their own behavior to prompt appropriate regulation of frustration when the tower falls down.

Next, have the parent bring out the hammer and tool bench. Have the parent begin to pound the nails into the holes and make sure to show how much fun the parent is having. Next, have the parent "accidentally" pound their finger when trying to pound the nails. Have the parent say "ouch" loud enough to ensure they've caught the child's attention. Then prompt the parent to label their feelings and response (e.g., "That made me sad because it hurt. But I know I'll be ok. I'll go get some ice to help my finger feel better.").

Suggestions for practicing in everyday routines: (10 minutes)

Talk with the parent about scenarios that they can remember in the recent past in which they have experienced an emotion and worked to regulate it in front of their child. Ask the parent if they labeled their emotion and response for their child. If the parent did not, ask the parent to think about how they could do this in the future. Talk with the parent about scenarios in which they find it difficult to regulate their emotions, and prompt them to think of their own relaxation and release tools that they may use to help regulate emotions in these scenarios.

Ask the parent to identify times in the recent past that the child has become dysregulated.

Ensuring the parent that hindsight is always 20/20, ask them to think about how they might have

prompted the child to use relaxation and/or release tools. Talk with the parent about how they may do this in the future. Complete the Relaxation/Release handout with parent (in parent binder) to document what tools may be used in the future.

Goal development: (5 minutes)

Fill out ReLACS Goal Setting Worksheet with parent. Determine how parent will practice the strategies reviewed during today's session in everyday activities with the child.

Session 4: Scaffolding Regulation II

Review Lesson 3 strategies, answer parent question (10 minutes)

****Videotape the dysregulating scenario after session****

Focus/Goal: Parent will learn strategies that help children manage their emotions. Help the parent understand the importance of maintaining flexibility when working to support emotion regulation in children with autism spectrum disorder. You will also identify with the parent times when dysregulated emotion and subsequent behavior can be ignored (i.e., when the child is not a danger to himself or others).

Materials:

- To be determined

Parent education (script to inform parent):

As parents, we all want to help our children be happy. Generally, what parents do to help manage upsetting situations for their children affects how children learn to manage their emotions, for better or worse. Some recent research suggests that controlling behaviors used by parents of preschoolers with autism are actually associated with less likelihood that the child will seek support from the parent in managing his emotions, and lower ability to regulate their own experience of fear. On the contrary, parent behavior that was warm and responsive did not seem to make much difference in how children were able to use parents to regulate their emotions or regulate their emotions on their own (Hirschler-Guttenberg et al., 2014). In other words, being able to provide guidance without being controlling seems to be more important in helping kids with autism to manage their emotions than being warm and loving (though we know this is important for other reasons!). This research also suggests that it is important that parents learn to be flexible in the way that they work to support emotion regulation in young children with

autism. Today, we'll cover a variety of strategies that can be used to assist your child with regulating his emotions. We'll talk about when each strategy might be helpful, given the situation and your son's unique strengths and areas of need. First, we will learn and practice three strategies that are best to use while your child is still learning to regulate their emotions during dysregulating scenarios that upset him, and then we will talk about strategies that are less intrusive, which are great to use once your child starts to gain independence and self-regulate their emotions.

SYSTEMATIC TRAINING INTERVENTION:

Encouraging your child: Young children often respond well to encouragement, such as saying, "I like how calm you are acting right now, even though you are very excited on the inside!" It is important to "catch" children when they are behaving the way that you expect them to in various situations. By acknowledging when they are behaving in the right way, you tell children what they should do. Too often, we tell children what they *should not* do, but we forget to tell them what they *should* do! Children need to know what the expectations are for a given situation. We can help them to learn those expectations for emotional management by encouraging/labeling positive behavior. You might say, "I know you are sad that there are no more chocolate chip cookies left. I like how you asked for a different type of cookie instead of crying or yelling!" Again, your knowledge of your child is important when using encouragement. Most children respond well to encouragement but some children, including those with autism, may respond negatively to an adult when they provide positive reinforcement in a highly animated

way. You will need to gauge what type and how emphatic encouragement can be to have a positive effect on your child.

- *Interventionist breaks each strategy down into steps (a process often referred to as a task analysis) and has the parent verbally state each step.*
- *Interventionist breaks the skill(s) down into steps (a process often referred to as a task analysis) and has the parent verbally state each step.*
- *Interventionist demonstrates examples and non-examples of the strategies.*
- *Interventionist prompts parent identification of appropriate and non-appropriate examples.*
- *Interventionist prompts parent role-playing of the strategies until all steps are completed with 100% accuracy.*
- *Interventionist uses positive reinforcement and corrective feedback throughout the procedure.*

Providing verbal prompts/questions: Children with autism benefit from direct instruction in how to perform various tasks. This is also the case when it comes to learning how to manage their emotions. Before a situation that typically leads to your child becoming dysregulated, remind him of the expectations for the situation. For instance, you might say, “I know you are excited to go to the library, but remember, you need to walk and use a quiet voice when we go inside.”

Verbal prompts do not just need to be about your expectations for the child’s behaviors. Reminders are also helpful to prepare the child for difficult transitions. You might say, “One more episode of Thomas and then we are going to turn it off

and play.” To prepare your child for the frustration that may occur when losing access to a highly preferred toy/activity. Timers are also helpful ways to provide reminders for children that cannot yet tell time. You can use a kitchen timer or the timer on your phone and inform your child that when the timer goes off, it is time for another activity.

- *Interventionist breaks each strategy down into steps (a process often referred to as a task analysis) and has the parent verbally state each step.*
- *Interventionist breaks the skill(s) down into steps (a process often referred to as a task analysis) and has the parent verbally state each step.*
- *Interventionist demonstrates examples and non-examples of the strategies.*
- *Interventionist prompts parent identification of appropriate and non-appropriate examples.*
- *Interventionist prompts parent role-playing of the strategies until all steps are completed with 100% accuracy.*
- *Interventionist uses positive reinforcement and corrective feedback throughout the procedure.*

Redirecting or distracting: Sometimes children are unable to regulate their emotions around a particularly distressing or exciting scenario, despite attempts to acknowledge, comfort, encourage, and prompt their appropriate response. In these scenarios, it is often helpful to try to redirect/distract the child to a different activity. Examples of times when it may be appropriate to redirect or distract include situations when the child’s response is particularly pronounced (e.g., tantrum behavior that may place the child at risk of hurting

himself or others) or scenarios in which it is not possible to alter the environment to meet the child's needs/wants (e.g., access to a highly preferred object/routine is restricted).

Attempts to redirect or distract the child will be most successful if the alternative activity/object is highly interesting to the child. It is helpful to brainstorm a list of activities that are highly interesting now, so that you have them in your "toolbox" for later. You might even consider keeping highly engaging activities in a bag and bringing them along with you when you take your child in the community so they can be accessed easily.

- *Interventionist breaks each strategy down into steps (a process often referred to as a task analysis) and has the parent verbally state each step.*
- *Interventionist breaks the skill(s) down into steps (a process often referred to as a task analysis) and has the parent verbally state each step.*
- *Interventionist demonstrates examples and non-examples of the strategies.*
- *Interventionist prompts parent identification of appropriate and non-appropriate examples.*
- *Interventionist prompts parent role-playing of the strategies until all steps are completed with 100% accuracy.*
- *Interventionist uses positive reinforcement and corrective feedback throughout the procedure.*

*** END OF SYSTEMATIC TRAINING INTERVENTION***

So, now that we've talked about all of these strategies, we should also talk about the importance of flexibility.

Flexibility also means avoiding being overly involved with managing your child's regulation of emotion. That is, it is important to take a step back and consider your child's ability to manage his own emotions, and determine what level of support he might need to gain even more independence in self-regulation. You'll need to become comfortable with using these strategies in situations in which they work, and knowing how much support you need to give your child without being too controlling or involved. You'll also need to be comfortable with placing your child in situations in which he will need to use self-regulation skills, rather than trying to avoid upsetting or overly exciting situations altogether (end script).

Suggestions for practicing in everyday routines: (10 minutes)

Encourage the parent to think of scenarios (at home or in the community) in which the child typically becomes dysregulated. Brainstorm with the parent what strategies may be most appropriate for each scenario. Document this information on the Goal Setting Worksheet so the parent has an idea of what scenarios she may try to use the strategies, and what strategies she can try in each scenario. Help the parent troubleshoot previous scenarios in which she has tried techniques like the ones discussed today, and they were not successful.

Goal development: (5 minutes)

Complete ReLACS Goal Setting Worksheet with parent. Determine how parent will practice the strategies reviewed during today's session in everyday activities with the child.

APPENDIX H

RELACS Session 1-3 Fidelity Checklist

Mark a 1 in the column that corresponds with what was observed or not observed in the video recorded session for a given component, and a 0 in the column that was not marked with a 1.

RELACS Component	<i>Present</i>	<i>Absent</i>
1. Review of previous session's topic, strategy use, and Q&A with parent		
2. Interventionist instructs parent on strategy based on the weekly session topic		
3. Parent practices strategy with child while interventionist provides coaching		
4. Interventionist provides suggestions for skill application in everyday routines		
5. Parent and interventionist develop goal for the parent implementation of the strategy in the coming week		
6. Interventionist checked with the parent in as needed about issues related to technology (i.e., repeated instructions when needed, facilitated webcam troubleshooting, etc.)		
Total:	___ / 6	___ / 6

RELACS Coaching Session Fidelity Checklist

Mark a 1 in the column that corresponds with what was observed or not observed in the video recorded session for a given component, and a 0 in the column that was not marked with a 1.

RELACS Coaching Session	<i>Present</i>	<i>Absent</i>
1. Interventionist records parent-child interaction for coding of parent strategy use		
2. Interventionist asks for parent's thoughts on the interaction.		
3. Interventionist provides positive and constructive feedback on strategy use.		
4. Interventionist uses a collaborative and empowering tone throughout feedback.		
5. For every strategy not used/used incorrectly, the interventionist labels/identifies the strategies (encouragement, verbal prompting, and redirecting/distracting).		
6. For every strategy not used/used incorrectly, interventionist provides rationale for why the parent should engage in the behavior.		
7. For every strategy not used/used incorrectly, interventionist breaks each strategy down into steps (a process often referred to as a task analysis) and has the parent verbally state each step.		

8. For every strategy not used/used incorrectly, interventionist breaks the skill(s) down into steps and has the parent verbally state each step.		
9. For every strategy not used/used incorrectly, interventionist demonstrates examples and non-examples of the strategy(ies).		
10. For every strategy not used/used incorrectly, interventionist prompts parent identification of appropriate and non-appropriate examples.		
11. For every strategy not used/used incorrectly, interventionist prompts parent role-playing of the strategies until all steps are completed with 100% accuracy.		
12. For every strategy not used/used incorrectly, interventionist uses positive reinforcement and corrective feedback throughout the procedure.		
13. Interventionist checked with the parent in as needed about issues related to technology (i.e., repeated instructions when needed, facilitated webcam troubleshooting, etc.)		
Total:	___ / 13	___ / 13

APPENDIX I

EDI Scores: Case Study A

No.	Item	Pre	Post	Difference	Follow-Up
		Score	Score	Pre/Post	Score
1	Appears angry or irritable	0	0	0	2
2	Has explosive outbursts	0	2	+2	1
3	Cries or stays angry for 5 minutes or longer	1	1	0	0
4	Cannot calm down without help from someone else	0	0	0	0
5	Suddenly switches to an opposite emotion (e.g. from sad to happy)	2	2	0	1
6	Frustrates easily	3	1	-2	1
7	Destroys property on purpose	0	0	0	2
8	Breaks down (crying, screaming) if told he/she can't do something	3	2	-1	1
9	Has extreme or intense emotional reactions	2	1	-1	1
10	Hard to calm him/her down when he/she is mad or upset	2	0	-2	0
11	Reactions are so intense that he/she has had to be removed from an activity or place	1	1	0	1
12	Physically attacks people	1	0	-1	0
13	Seems on edge	0	0	0	1
14	When upset or angry, he/she stays that way for a long time	1	0	-1	0
15	Does not seem to enjoy anything*	0	0	0	0
16	Emotions go from 0 to 100 instantly	2	1	-1	1
17	Has trouble calming him/herself down	3	0	-3	0
18	Tense or agitated and unable to relax	1	0	-1	1

19	Seems to be in a rage	0	0	0	0
20	Very little makes him/her happy*	0	0	0	0
21	Reactions are usually more severe than the situation calls for	2	0	-2	0
22	Becomes upset without a clear reason	0	0	0	0
23	Refuses to leave the house or go to school or activities unless forced*	1	1	0	2
24	Has mood swings	0	0	0	0
25	Difficult to distract if he/she is frustrated or upset	2	0	-2	0
26	Not responsive to praise or good things happening*	1	0	-1	0
27	Cannot change his/her mood even with your best efforts	0	0	0	0
28	Easily triggered/upset (you have to walk on eggshells around him/her)	2	0	-2	0
29	Seems sad or unhappy*	0	0	0	0
30	Appears uneasy through the day*	0	0	0	0

Note. 0 = Not at all, 1 = Mild, 2 = Moderate, 3 = Severe, 4 = Very Severe. * = Dysphoria

subscale item. A bolded negative difference score indicates a decreased score from pre- to post-intervention for Case Study A.

APPENDIX J

EDI Scores: Case Study B

No.	Item	Pre	Post	Difference	Follow-Up
		Score	Score	Pre/Post	Score
1	Appears angry or irritable	1	0	-1	0
2	Has explosive outbursts	0	0	0	0
3	Cries or stays angry for 5 minutes or longer	2	1	-1	0
4	Cannot calm down without help from someone else	0	0	0	0
5	Suddenly switches to an opposite emotion (e.g. from sad to happy)	0	0	0	0
6	Frustrates easily	2	1	-1	1
7	Destroys property on purpose	2	0	-2	0
8	Breaks down (crying, screaming) if told he/she can't do something	3	1	-2	1
9	Has extreme or intense emotional reactions	3	1	-2	1
10	Hard to calm him/her down when he/she is mad or upset	2	1	-1	0
11	Reactions are so intense that he/she has had to be removed from an activity or place	0	0	0	0
12	Physically attacks people	0	0	0	0
13	Seems on edge	0	0	0	0
14	When upset or angry, he/she stays that way for a long time	0	0	0	0
15	Does not seem to enjoy anything*	0	0	0	0
16	Emotions go from 0 to 100 instantly	1	0	-1	0
17	Has trouble calming him/herself down	1	0	-1	0
18	Tense or agitated and unable to relax	0	0	0	0

19	Seems to be in a rage	0	0	0	0
20	Very little makes him/her happy*	0	0	0	0
21	Reactions are usually more severe than the situation calls for	0	1	+1	0
22	Becomes upset without a clear reason	2	1	-1	0
23	Refuses to leave the house or go to school or activities unless forced*	2	0	-2	0
24	Has mood swings	1	0	-1	0
25	Difficult to distract if he/she is frustrated or upset	1	0	-1	0
26	Not responsive to praise or good things happening*	1	0	-1	0
27	Cannot change his/her mood even with your best efforts	1	0	-1	0
28	Easily triggered/upset (you have to walk on eggshells around him/her)	1	0	-1	0
29	Seems sad or unhappy*	1	0	-1	0
30	Appears uneasy through the day*	0	0	0	0

Note. 0 = Not at all, 1 = Mild, 2 = Moderate, 3 = Severe, 4 = Very Severe. * = Dysphoria

subscale item. A bolded negative difference score indicates a decreased score from pre- to post-intervention for Case Study B.

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