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Emotion Coregulation Processes Between Parents and Their Children with ASD



Valentina Valentovich¹, Wendy A. Goldberg¹, Dana Rose Garfin² and Yuqing Guo²

¹Department of Psychological Science, University of California, Irvine, Irvine, CA, USA
²Sue & Bill Gross School of Nursing, University of California, Irvine, Irvine, CA, USA

Definition

Children's emotion regulation capabilities are strategies that are used to manage (inhibit, enhance, or maintain) emotional experiences (Thompson 1994) and develop within the context of social interactions. Parents facilitate the advancement of their children's emotion regulation through *emotion coregulation* processes. Conceptually, emotion coregulation involves transactional exchanges between parent-child dyads; however, there is a lack of consensus regarding the optimal definition of emotion coregulation. Numerous related terms and definitions have been used to describe dyadic emotion processes between parents and their children. For example, synchrony refers to parents and children matching their behaviors and affect states to regulate emotional arousal (Feldman 2003); parent-driven coregulation involves behaviors that parents engage in to motivate or scaffold

children's emotion regulation strategies (Gulsrud et al. 2010; Ting and Weiss 2017), and shared affect describes matched emotion expression between parents and children. In our program of research (Guo et al. 2017a; Valentovich et al. 2018), emotion coregulation is defined as a dynamic process of mutual construction of affective states and regulation of arousal between parents and children (see also Butler and Randall 2013; Tronick 1989).

Emotion coregulation with parents provides children the foundation for the development of their own emotion regulation capabilities. The ability to self-regulate emotional states and behavioral actions begins to emerge in infancy and continues to develop throughout childhood through interactions with important others (Kopp 1982, 1989), with parent-child interactions playing a critical role. During the early years, children's growing self-regulation capabilities require additional support to manage emotional arousal. Parents demonstrate emotion regulation strategies and provide external regulation for young children (Kopp 1989). Children initially depend on their parents to assist in modulating their emotional experiences (e.g., parent physically soothes child by holding her) given young children's limited self-regulation skills. During social interactions, parents and children jointly regulate their emotional experiences through emotion coregulation (Cole et al. 2004; Feldman 2003). Repeated dyadic interactions allow for children to practice effective emotion regulation

strategies and for parents to facilitate (e.g., scaffold) children's strategies. As children become older, they gain a wider range of emotion regulation strategies and learn to increasingly rely on their own self-regulation strategies (Calkins and Hill 2007; Kopp 1989).

An important aspect to consider when studying emotion coregulation is the emotional content of parent-child interactions. The emotional content of dyadic interactions, which may include mutual positivity, mutual negativity, or mismatched emotion engagement (e.g., child in negative state and mother in positive state), has been the focus of many studies on neurotypical (NT) children and children with behavioral problems. For example, one study examined parent-NT child shared emotion expression during a semi-structured play activity and children's behavioral outcomes (Lindsey et al. 2013). Results showed that mutual positivity between these young children and their mothers predicted fewer aggressive behaviors with peers, whereas mutual negativity predicted more aggressive behaviors with peers 8 months later. For parents and their children with behavioral problems, the emotional content of emotion coregulation differs from those of NT dyads. In one study, mother-child dyads of preschool-aged children with behavior problems engaged in more mutual negativity and mismatched emotion engagements relative to dyads of NT children (Cole et al. 2003). Increased mutual positivity and decreased mutual negativity in dyads over time were also found to be related to improvements in behavioral problems. These findings suggest that emotional content is an important aspect of emotion coregulation and children's adaptive functioning. It may be particularly important to include a focus on emotional content when examining emotion coregulation processes in children with developmental challenges.

Emotion coregulation processes between parents and their children with developmental disorders, such as Autism Spectrum Disorder (ASD), require unique consideration. Children with ASD have deficits in social interactions that impact parent-child social exchanges, such as a tendency to focus on objects and impaired joint attention on a shared task (American Psychiatric Association

2015; Dawson et al. 2004). Moreover, children with ASD tend to have impaired emotion regulation capabilities. The role that parents of children with ASD have with respect to teaching key emotion regulation strategies may be particularly challenging, as these children tend to lack adaptive emotion regulation strategies and may instead react with intense emotional responses and poor emotional control (Mazefsky et al. 2013). Children with ASD may not respond to parents' attempts at effective coregulation strategies in a manner analogous to NT children. Thus it is important to gain insight into early emotion coregulation processes between parents and their children with ASD as children are developing their self-regulation abilities. Such knowledge may in turn inform parent-child interventions targeting children's emotion regulation and adaptive functioning.

Historical Background

ASD is a lifelong, neurodevelopmental disorder that is characterized by challenges in social communication and restricted, repetitive behaviors (American Psychiatric Association 2015). In addition to core symptoms, children with ASD also commonly exhibit impairments in behavioral and emotional functioning. Prevalence rates for at least one co-occurring behavioral problem, such as internalizing symptoms (e.g., anxiety and depression) or externalizing symptoms (e.g., aggression and impulsivity), range from approximately 70% to 86% for children with ASD (Chandler et al. 2016; Ooi et al. 2011; Simonoff et al. 2008). Children with ASD also tend to have difficulties with aspects of emotional functioning, such as emotion expression, recognition, and regulation (Konstantareas and Stewart 2006; Uljarevic and Hamilton 2013). Importantly, impairments in children's ability to regulate their reactions to emotionally arousing situations may represent one key factor in the mechanisms that underlie the behavioral problems that children with ASD display (Mazefsky and White 2014).

The ability to regulate emotional experiences across contexts is a significant goal in early child

development and is associated with concurrent and overall adaptive functioning (Denham et al. 2003; Eisenberg et al. 1993). Effective emotion regulation strategies (e.g., problem-solving and cognitive reappraisal) are linked to adaptive functioning, whereas ineffective strategies (e.g., physical aggression and avoidance) are associated with a host of emotional, behavioral, and social problems throughout the life span (Aldao et al. 2010; Southam-Gerow and Kendall 2002). Prior research on the emotional challenges that children with ASD face has primarily focused on children's emotion expression and recognition (e.g., Rump et al. 2009; Sasson 2006; Yirmiya et al. 1989); findings show difficulties in both domains. Over the past two decades, emotion regulation in children with ASD has begun to receive more attention (Cai et al. 2018; Mazefsky et al. 2013). Although the body of work investigating emotion regulation capabilities of children with ASD is relatively small, such work represents important advances in our understanding of emotional functioning in children with ASD.

Research on emotion regulation has examined diagnostic group differences between children with ASD and NT children as well as the relationship between emotion regulation and socioemotional and behavioral outcomes in children with ASD. Overall, children with ASD have greater impairments in emotion processes relative to their NT peers. Specifically, in terms of emotion regulation skills, studies using various methodologies, including behavioral observations, child reports, and parent reports, have demonstrated that children and adolescents with ASD use more ineffective strategies and fewer effective strategies than NT peers across a variety of contexts (e.g., positive and negative situations) (Jahromi et al. 2012; Konstantareas and Stewart 2006; Samson et al. 2015). For example, observations of children during frustrating tasks demonstrated that preschool- and school-aged children with ASD used fewer efficient strategies (e.g., distraction) and more maladaptive strategies (e.g., physical objection) compared to NT peers (Jahromi et al. 2012; Konstantareas and Stewart 2006). Similarly, another study using parent report found that relative to NT peers, school-

aged children and adolescents with ASD engaged in increased maladaptive strategies (e.g., repetitive behaviors) and decreased adaptive emotion regulation strategies (e.g., cognitive reappraisal) across positive and negative emotion states (Samson et al. 2015). Moreover, these children were less effective at utilizing strategies such as problem-solving, social support, and distraction.

In addition to the increased challenges that children with ASD encounter in regulating their emotional experiences relative to NT peers, emotional difficulties are also associated with socioemotional and behavioral problems. For example, in one study, parent ratings of emotion regulation skills of their preschool-aged children with ASD were related to children's socioemotional functioning, such that ineffective emotion regulation was associated with decreases in social skills and increases in internalizing and externalizing behaviors 10 months later (Berkovits et al. 2017). Similarly, in another study, 9- to 12-year-old children with ASD who self-reported using maladaptive emotion regulation strategies, such as self-blame, also had higher levels of depressive symptoms and anxiety (Rieffe et al. 2011).

For children with ASD, early parent-child relationships may be particularly important for the development of efficient emotion self-regulation and for improving maladaptive behaviors. However, parent-child relationships within the context of emotion coregulation have only recently been explored in a handful of empirical studies (e.g., Gulrud et al. 2010; Hirschler-Guttenberg et al. 2015a; Ting and Weiss 2017). Additionally, fathers are less often included in such research relative to mothers, and few studies have investigated emotion coregulation processes between fathers and their children with ASD (e.g., Hirschler-Guttenberg et al. 2015b). Prior studies on NT dyads suggest that fathers play an important role in children's socioemotional development (e.g., Cabrera et al. 2007; Lindsey et al. 2013). The inclusion of fathers in research on emotion coregulation in dyads of children with ASD may be important in order to expand our understanding of their unique contribution to the

development of children's emotion regulation capabilities and adaptive functioning.

Prior work has demonstrated the importance of emotion coregulation, yet our understanding of these dyadic emotion processes for children with ASD and how they relate to their functioning is limited. Thus, the objectives of our program of research were to (a) compare patterns of emotion coregulation in mother-child dyads of children with ASD and NT children (Guo et al. 2017a), (b) examine associations between aspects of emotion coregulation and children's behavioral functioning in mother-child dyads of children with and without ASD (Valentovich et al. 2018), and (c) investigate emotion coregulation processes and children's behavioral functioning in father-child dyads of children with ASD (Guo et al. 2017b). Grounded in dynamic systems theory, our studies used a novel application of the State Space Grid (SSG) method (Lewis et al. 1999), a dyadic micro-level approach, to analyze parent-child emotion engagements during a semi-structured play activity at home. Advantages of using a dyadic micro-level method are that parent and child behaviors can be analyzed simultaneously, rather than individually, and that momentary shifts between parent-child behaviors and affect states, rather than global behaviors, can be captured.

Current Knowledge

Past and current research indicates that parents shape children's emotion regulation capabilities during dyadic social exchanges by modeling appropriate behaviors, providing emotional coaching (e.g., labeling and validating emotions), teaching specific regulation strategies (e.g., redirecting attention and complex cognitive strategies), and monitoring and responding to children's cues, among others (Morris et al. 2007; Thompson and Meyer 2007). Parents of children with and without ASD engage in similar types of emotion coregulation behaviors; however, they differ in the frequency of behaviors. Parents of children with ASD, for example, use more direct, active strategies (e.g., redirecting and

prompting) and engage in more physical behaviors (e.g., physical soothing) relative to parents of NT children (Doussard-Roosevelt et al. 2003; Gulsrud et al. 2010; Hirschler-Guttenberg et al. 2015b). Parents of children with ASD are sensitive to children's cues, and the differences in the frequency of specific strategies used may suggest an awareness of the child's developmental needs. Additionally, parent emotion coregulation behaviors are associated with behavioral outcomes for children with ASD. For example, greater parental scaffolding (e.g., sensitive responses to child) during discussions of negative past events between parents and their school-aged children with ASD was found to be associated with fewer child externalizing behaviors (Ting and Weiss 2017).

Recently, the SSG approach, based on dynamic systems theory, has provided a unique method for examining emotion coregulation in parent-child dyads. The SSG has been used to analyze fine-grained parent and child emotion processes simultaneously to capture the transactional nature of dyadic interactions, rather than a global examination (Hollenstein 2007; Hollenstein and Lewis 2006). Moreover, the SSG allows for operationalizing emotion coregulation in terms of emotional content and structure of dyadic interactions. Emotional content refers to the ability of dyads to initiate and maintain emotion engagement (i.e., mutual positive, mutual negative, or mismatched interactions). Structure refers to the emotional variability of interactions (i.e., the range of emotional interactions, the shifts of emotions, and perseverance in an emotion state) (Granic et al. 2007; Hollenstein et al. 2004).

Research utilizing the SSG has demonstrated that both the emotional content and structure of emotion coregulation are associated with children's behavioral outcomes. For example, Hollenstein et al. (2004) analyzed interactions between parents and their high-risk children during a series of activities, including discussions of problems that cause conflict. Results indicated that decreased dyadic emotional variability (structure) when children were in kindergarten predicted higher levels of children's externalizing behaviors in first grade. Lunkenheimer et al. (2011) assessed parent-child emotion

coregulation in a challenging block design task at home when children were 3 years old. The results showed that the interaction between dyadic parent-child emotional variability (structure) and positive affect predicted lower externalizing problems in children at age 5.5 years.

This method previously has been used to examine dyads of NT children and children with behavioral problems. Our lab is the first to use the SSG to examine emotion coregulation processes in families raising children with ASD (Guo et al. 2017a; Valentovich et al. 2018). In our recent studies, the emotional content and structure of emotion coregulation were examined in dyads of children with ASD and dyads of NT children utilizing the SSG approach. Mothers and their preschool-aged children completed the Three Boxes procedure (Tamis-LeMonda et al. 2004; Vandell 1979), a 10-min semi-structured play activity, in their home. During the activity, mothers and their children were given three numbered boxes that contained toys, and mothers were asked to open the boxes in sequential order. This procedure reflects activities that mothers and their children typically engage in and reliably elicits maternal and child behaviors. Play sessions were videotaped for later coding of emotion engagement states of mothers and children. Children's internalizing and externalizing behaviors were also assessed using mother-reported Vineland Adaptive Behavior Scales (Sparrow et al. 2005) scores.

A novel coding scheme was developed to capture emotion engagements, which were predicated on behaviors, body postures, attention, facial expressions, and vocalizations, in both families of NT children and children with ASD. Mothers and children were coded separately for low, medium, and high levels of positive engagement, negative engagement, and disengagement states; children were also coded for object engagement (for detailed information on the coding schemes, see Guo et al. 2017a). Mangold International's INTERACT 9.47 (Mangold 2007) software program was used to code engagement states in 5-second intervals. The separate codes were merged for each dyad to create dyadic engagement states: *mutual positive engagement* (mother and child in

any positive engagement state), *mutual negative engagement* (mother and child in any negative engagement or disengagement state), *mismatched engagement* (mother in any negative engagement or disengagement state and child in any positive engagement state; mother in any positive engagement state and child in any negative engagement or disengagement state), and *child-object* (mother in any engagement state and child in object engagement). The dyadic engagement codes were exported to the SSG software (State Space Grid GridWare 1.1.; Lamey et al. 2004) to obtain the emotional content (i.e., initiating and sustaining dyadic engagement states) and the structure (i.e., range of emotional interactions, the shifts of emotions, and perseveration in an emotion state) of the interactions.

The first goal of our research was to compare the emotional structure and content of interactions between mother-child dyads of children with ASD and dyads of NT children (Guo et al. 2017a). Results indicated that in terms of the structure, dyads of children with ASD engaged in greater emotional variability (i.e., a wider range of emotional interactions, greater shifts of emotions, and less time spent in an emotion state) relative to dyads of NT children. In terms of emotional content, dyads of children with ASD initiated mutual positive, mismatched, and child-object engagements more frequently and spent more time in mismatched and child-object engagements relative to NT dyads, whereas dyads of NT children spent more time in mutual positive engagements relative to dyads of children with ASD. Results suggest that high emotional variability in a low-stress context may not imply adaptive interactions for children with ASD but rather suggests difficulty maintaining positive interactions with their mothers.

The second goal of our research was to investigate whether interactions between emotional variability (structure) and mutual positive/negative engagements (content) of emotion coregulation were associated with maladaptive behaviors in children with ASD (Valentovich et al. 2018). Results indicated that for dyads of children with ASD, greater emotional variability (structure) and more frequent initiation of mutual

positive engagements (but not negative engagements) were associated with fewer maladaptive behaviors (i.e., internalizing and externalizing behaviors) for children with ASD. These findings suggest that both flexible interactions and shared positive interactions may play an important role in preventing behavioral problems in children with ASD.

New research by Guo, Goldberg, Valentovich, and Garfin includes fathers and their children with and without ASD in research designed to parallel the mother-child studies. Semi-structured play activities were videotaped and later coded for father and child emotion engagement states using the coding schemes described above. Fathers also completed the Vineland Adaptive Behavior Scales (Sparrow et al. 2005) to assess their children's adaptive and maladaptive behaviors. This is the first study to examine the association between emotion coregulation in father-child dyads of children with ASD and children's adaptive functioning utilizing the SSG method (Guo et al. 2017b). In general, we found that more time spent in positive engagements (content) and less time spent in mutual negative engagement (content) were associated with higher levels of adaptive behaviors in children with ASD. These results point to the importance of father-child positive interactions in social and emotional development in children with ASD.

Future Directions

Studies conducted to date on aspects of emotion coregulation between parents and their children with ASD demonstrate its importance for children's adaptive functioning; however, this area of inquiry is underresearched. Several key areas should be considered in future studies.

Emotion Coregulation Across Contexts

In our research, parents and their children were observed during a low-stress play task. The type of play (e.g., toy play, physically orientated play) that parents and children engage in as well as different emotion-eliciting contexts (e.g., low stress vs. high stress) may impact the process of

emotion coregulation (Hirschler-Guttenberg et al. 2015b; Jahromi et al. 2012; Warreyn et al. 2005). For example, in past research, mothers' emotional availability toward their children with ASD varied across free play, structured play, and social play contexts (Dolev et al. 2009). In a mildly frustrating context, children with ASD used a greater range of emotion regulation strategies but were less effective compared to NT children (Konstantareas and Stewart 2006). Hirschler-Guttenberg and colleagues (2015b) showed that children with ASD displayed more negative emotions and behaviors with fathers in a fearful context, but not in a joyful context compared to NT peers. Although children with ASD are more vulnerable to negative emotional states, more studies are needed to clarify how both parents and children respond to different social contexts (Mazefsky et al. 2012). Furthermore, additional research should examine how emotion coregulation processes will unfold in terms of both emotional structure and content when parent-child behaviors are observed in contexts other than play, such as during high-stress tasks.

Longitudinal Design

Much of the research on emotion coregulation to date has been cross-sectional. Age effects of emotion regulation on developmental outcomes would be removed in a longitudinal design. Future work with a longitudinal study design would help clarify relationships between emotion coregulation and developmental outcomes in children with ASD. In this way, a mechanism of emotion coregulation for psychiatric comorbidity and social competencies in children with ASD would be better understood (Mazefsky et al. 2013). Specifically, future research could expand emotion coregulation to include not only micro-real-time measurement but also context-to-context emotional variability and developmental changes as described in Hollenstein's Flex3 model (Hollenstein 2015).

Dyadic Repair

Disruptions that affect positive parent-child interactions occur routinely but can be managed by a process of dyadic repair (Beeghly and Tronick

2011). The ability of parents and children to repair ruptures, or to recover from temporarily mismatched or negative interactions by returning to positive states, could be crucial for children's adaptive functioning (Beeghly and Tronick 2011; DiCorcia and Tronick 2011). For example, NT preschool-aged children who engaged in higher rates of repair processes with their mothers during a challenging puzzle task also demonstrated the ability to use appropriate regulation strategies and had fewer externalizing behaviors 4 months later (Kemp et al. 2016). Ruptures in positive interactions and attempts to repair such interactions may provide an opportunity for children to internalize efficient strategies for managing challenges and learn that they do not need to remain in negative situations (Tronick and Beeghly 2011). Future work should examine repair processes in dyads of children with ASD across low- and high-stress contexts (e.g., free play in the home environment vs. challenging laboratory task) as well as explore how dyadic repair processes are related to children's adaptive functioning.

Clinical Implications

Past research has emphasized the negative aspects of emotion regulation among children with ASD. Our studies expand prior findings by demonstrating that dyads of parents and their children with ASD can initiate positive interactions, but they have a diminished capacity for sustaining positive interactions relative to NT dyads in a low-stress, home environment. These results could guide future family-systems-based interventions that focus on improving the ability of parent-child dyads to maintain longer positive interactions, which may be particularly important for families raising children with ASD. In particular, children may benefit from interventions that focus on helping parents assist their children in engaging in dyadic positive interactions to reduce children's behavioral problems and improve adaptive functioning. Recent studies have generated evidence that a variety of techniques could plausibly be used to extend positive interactions in dyads with children with ASD; these include mentalization-based interventions (Slade 2005), relational savoring interventions (Burkhart et al.

2015), and mindfulness-based interventions (Cachia et al. 2016). From our research, we recommend that future studies incorporate micro-analytic indicators of different aspects of emotion coregulation when evaluating the effects of interventions.

See Also

- ▶ Emotion Regulation
- ▶ Emotion Regulation Strategies in Preschoolers with Autism
- ▶ Internalization of Emotion Co-regulatory Support in Children with ASD
- ▶ Maladaptive Behavior
- ▶ Mutual Regulation
- ▶ Social Behaviors and Social Impairment
- ▶ Vineland Adaptive Behavior Scales

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