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## The importance of parent self-regulation and parent–child coregulation in research on parental discipline

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### Abstract

Parent self-regulation is multifaceted, involving emotional, cognitive, and biological processes that support or constrain parenting behavior. It is highly relevant to disciplinary contexts in which parents' regulatory difficulties can contribute to harsh discipline, which is linked to children's maladjustment. In this article, we address why parents' self-regulation is an essential focus for basic and applied research on parental discipline. We emphasize the need to 1) incorporate and test multiple domains of parent self-regulation to understand their respective and interactive contributions and 2) understand how parent self-regulation interfaces with parent-child coregulation in delineating mechanistic pathways of the effects of harsh discipline on children's adjustment. These foci will more fully inform the etiology of children's maladjustment related to harsh discipline and knowledge regarding specific, malleable intervention targets aimed at reducing harsh discipline.

### Keywords

parent self-regulation; parent-child coregulation; harsh discipline

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Parenting young children is challenging and requires emotional, cognitive, and biological self-regulation to navigate day-to-day stressors and children's changing developmental needs (Crandall et al., 2015; Hajal & Paley, 2020). Parent self-regulation (PSR) is highly relevant to disciplinary contexts given that shaping and responding to children's behavior requires persisting at difficult goals, delaying gratification, and inhibiting impulses that could be harmful to children. PSR is particularly important for understanding harsh discipline, defined as parents' use of coercive and verbally aggressive commands and physical punishment (e.g., grabbing, shaking, spanking) to discipline children, which is a common precursor to physical abuse (Gershoff et al., 2017). Regulatory deficits make parents more likely to respond to children's misbehavior in reactive and harsh ways, which in turn puts children at risk for maladjustment in the form of emotion dysregulation and behavior problems (Deater-Deckard et al., 2012; Straus & Mouradian, 1998; Sturge-Apple et al., 2011). Therefore, family intervention programs that target improved disciplinary

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practices are increasingly considering PSR as a potentially critical target (Sanders & Mazzucchelli, 2013).

Accordingly, we argue that PSR should be a major focus of developmental psychopathology and intervention science. However, research on PSR has been siloed, with emotional, cognitive, and biological domains typically studied separately. This is surprising since most researchers agree that regulatory processes operate in a dynamic and integrated fashion, with different domains working together to support intra- and interpersonal goals (Diamond & Aspinwall, 2003). The equifinality implied by research findings in this area, suggesting that various parental regulatory difficulties lead to comparably maladaptive disciplinary practices (Deater-Deckard et al., 2012; Henschel et al., 2014), also highlights the value of empirically integrating multiple domains of PSR.

Additionally, emerging research suggests that parent-child coregulation is a strong candidate mechanism by which parents' harsh discipline influences children's adjustment (Brown et al., 2022; Lunkenheimer et al., 2017). Parent-child coregulation refers to the dynamic processes by which parent and child mutually regulate one another's emotions, cognitions, biology, and behavior; as such, it is considered an important developmental mechanism through which children internalize regulatory skills from early interactions with parents (Lunkenheimer et al., 2017). Coregulation is a product of two individuals, but parents are especially likely to shape these processes because of the power differential that characterizes this dyad when children are young, which may confer harm if that power differential involves harsh discipline. Furthermore, if difficulties with PSR are closely related to harsh discipline and PSR carries weight in shaping coregulation given parents' unique power to influence young children, then PSR is likely a vital part of studying how harsh discipline influences children's adjustment via parent-child coregulation. However, the field lacks empirical attention to the role of PSR in relations among parental discipline, parent-child coregulation, and children's outcomes.

Accordingly, in this article, we review evidence on PSR and argue for a more integrated, multidomain approach to PSR, as well as its integration with the study of parent-child coregulation in research on parents' harsh discipline. Many of the studies we reviewed were of primarily Western, White community samples and may be limited in their applicability because they may not generalize to other populations. In light of established differences in disciplinary behavior across ethnic, racial, and cultural groups (Lansford, 2022), more work is needed to explore the role of PSR in harsh discipline in relation to ethnicity, race, and culture, as well as cultural differences in the utility and effectiveness of interventions that target reducing harsh discipline via PSR.

## Parental Regulatory Difficulties and Harsh Discipline

Disciplining young children requires dealing with children's changing needs, emotions, and behaviors on a daily basis. Parents with poorer self-regulation have more difficulty responding constructively to challenging child behavior (Martini et al., 2004). One of the more common ways regulatory deficits manifest in parenting is via harsh discipline, for example, feeling angry and struggling to inhibit a prepotent, harsh behavioral impulse (e.g.,

yelling or hitting) when responding to children's difficult behavior. From the perspective of dynamic systems theory (Thelen & Smith, 1998), these responses are a function of dynamic relations among intraindividual, interindividual, environmental, and temporal processes. For example, regulatory challenges may stem from parents' own history, neurobiology, or cognition, or from the environmental context, relationship with the child, or child's temperament. Poorer self-regulation is more likely when adversity outweighs resources to manage challenges, resulting in problematic responses to stress (Vohs & Baumeister, 2016). Harsher parents have been exposed disproportionately to adversity and experience parenting as more stressful compared to parents with lower levels of adversity (Azar et al., 2008). Thus, PSR difficulties may lead to disciplinary behavior categorized as harsh, but such difficulties may be a product of a dynamic system that changes over time in response to contextual demands.

Harsh discipline is a critical problem: An estimated one billion children globally are disciplined harshly every day (United Nations, 2015) despite consensus that such actions are harmful to children (Gershoff et al., 2017). Parents' use of this type of discipline may be reinforced by cultural or family norms, or modeling of disciplinary behavior (Holden et al., 1995; Lansford, 2022), but these factors alone do not fully account for its use. Why does the problem of harsh discipline persist despite evidence, education, and stigma against it? One possibility is that we do not fully understand the complex regulatory processes that drive parenting behavior in the moment. To effectively reduce harsh discipline, we must identify mechanistic processes that drive real-time parental responses and are malleable via intervention.

PSR is a prime candidate for what underlies and maintains the use of harsh discipline: Dysregulation is evident in harsh parents' emotions, cognition, and biology (Deater-Deckard & Bell, 2017). Regulatory dysfunction also contributes directly to harsh discipline. For example, parents are more likely to punish children physically when they are in a bad mood prior to the misbehavior, suggesting that reactivity drives harsh behavior above and beyond using this type of discipline as a preferred strategy (Holden et al., 1995). PSR appears malleable because it varies across time and context in laboratory studies (Lunkenheimer et al., 2016; Sturge-Apple et al., 2011), can be translated into teachable moments in interventions (Prinz et al., 2016), and reduces parent-child coercion in interventions (Granic et al., 2007).

Focusing on PSR could also help the study of stigmatized parenting, revealing what self-reports of harsh discipline cannot; for example, studying how parents' cognitive flexibility relates to implicit attribution biases about harsh discipline (Sturge-Apple et al., 2015) could inform interventions to adjust attributions for harsh parents (Sawrikar & Dadds, 2018). However, research on harsh discipline has more often focused on parenting styles, attributions, or behaviors than on PSR (Wilson et al., 2008), and empirical integrations of multiple domains of PSR are rare. Next, we review evidence for the role of individual domains of PSR in harsh discipline. Then we address the potential benefits of studying these domains together.

### Parents' Emotion Regulation and Harsh Discipline

Emotional reactivity lies at the core of theories of aggressive behavior, reflecting challenges in regulating impulses around anger and frustration (Vohs & Baumeister, 2016). Thus, parents who struggle to regulate these emotions may be more likely to react with yelling or hitting. Parents' higher emotional reactivity is related to a greater potential for child abuse (Henschel et al., 2014) and harsher parenting in socioeconomically and ethnically diverse samples (Martini et al., 2004; Rodriguez & Green, 1997). In a study of mostly White middle-class mothers in the United States, about half reported experiencing anger about their children's misbehavior, which increased their likelihood of spanking (Holden et al., 1995). Furthermore, parenting stress and anger jointly predict more frequent use of harsh discipline (Rodriguez & Green, 1997). When harsh discipline is impulsive or emotional in nature, it is associated with more behavior problems in children and is perceived as less effective by parents (Straus & Mouradian, 1998). Harsh parents also show greater attention bias to negative emotions and threat, and perceive children's behaviors as more negative than do nonharsh parents and independent raters (Milner, 2003). Collectively, these findings suggest that patterns of parental emotion regulation associated with harsh discipline involve higher levels of emotional reactivity and bias toward anger.

### Parents' Cognitive Regulation and Harsh Discipline

Harsh discipline is associated with lower levels of executive function skills in parents, assessed with both behavioral and neurophysiological measures (Deater-Deckard & Bell, 2017; Deater-Deckard et al., 2012). Harsh discipline may be a more impulsive, quick fix than disciplinary strategies that require delaying gratification as parents wait for young children to internalize skills or codes of conduct. For example, executive function supports parents engaging in tasks that are unpleasant or unrewarding in the short term, such as being patient and constructive while children struggle to eat their vegetables, use the bathroom, or refrain from hitting others. Harsher parents use fewer effortful proactive and scaffolding behaviors that involve applying executive function (Azar et al., 2008), and when they do use these behaviors, they find it physiologically taxing (Skowron et al., 2013). Parenting young children also requires having flexible cognitive schemas and identifying various strategies to solve problems (Azar et al., 2008). However, harsher parents have more rigid schemas and problem-solving strategies (Milner, 2003), as well as more rigid attributions of threat and hostility when exposed to repeated misbehavior (in a sample of White and Black parents; Dopke & Milner, 2000). Harsher parents also show greater attention and contingent responding to negative than positive children's behaviors (Milner, 2003), thus reinforcing aversive interactions. In summary, parents' cognitive regulation is associated with harsh discipline via less frequent application of executive function skills and use of more rigid schemas, attributions, and disciplinary strategies.

### Parents' Biological Regulation and Harsh Discipline

Harsher parents often show the neurobiological wear and tear caused by exposure to prior adversity, evidenced through chronic activation of the hypothalamic-pituitary-adrenal axis or dysregulated functioning of the autonomic nervous system (Deater-Deckard & Bell, 2017; Skowron et al., 2013; Sturge-Apple et al., 2011). They tend to have dysregulated profiles

of biological hyperarousal or hypoarousal, reflecting heightened or blunted reactivity, respectively, to stress. Hyperarousal of the autonomic nervous system has been linked with hostile and intrusive parenting, whereas hypoarousal is linked with disengaged parenting (Sturge-Apple et al., 2011). In one study of Black and White families, harsher parents also had higher levels of baseline cortisol levels, indicating baseline regulatory biology characterized by chronic stress, but also greater autonomic nervous system reactivity to parenting demands (Mills-Koonce et al., 2009), reflecting heightened reactivity in response to acute challenges. Collectively, these findings suggest that harsh discipline is linked to a dysregulated stress response characterized by within-person extremes (i.e., over- or underreactive). This, in turn, suggests a curvilinear relation between harsh discipline and biological reactivity in the autonomic nervous system and hypothalamic-pituitary-adrenal axis.

### Integration Across Domains of Parent Self-Regulation

Self-regulation is a multidimensional process involving the active coordination of emotion, cognition, biology, and behavior throughout life (Diamond & Aspinwall, 2003). The idea that different domains of self-regulation have additive or interacting influences is not new, but has been underapplied with respect to PSR. Some studies have integrated multiple domains of PSR within single measures. For example, frontal resting encephalogram asymmetry is a biomarker thought to reflect emotion regulation, emotion expression, and behavioral approach and withdrawal tendencies. In one study, Chinese parents' and children's frontal resting encephalogram asymmetry were negatively interrelated when parents' psychological control was higher, suggesting that higher control may inhibit children's self-regulation (Wang et al., 2018).

Additionally, some constructs in research on harsh discipline are defined in ways that blend regulatory and parenting processes. For example, researchers have used *overreactive parenting* as a synonym for harsh discipline, defined as angry, intrusive, or punitive discipline (Lorber et al., 2003), implying emotional dysregulation. Although integrated measures are informative, to clarify definitions and understand the respective contributions of different domains of self-regulation, researchers should assess self-regulation domains and their interacting effects using independent measures.

When multiple self-regulatory domains are tested within one model, greater cognitive rigidity (Lorber et al., 2003) and poorer working memory (a facet of executive function; Deater-Deckard et al., 2010) are related to more emotionally and behaviorally reactive responses to children's misbehavior, which is associated with harsh discipline. Furthermore, parents' hostile child attributions are related to their higher levels of negative affect and blunted autonomic nervous system reactivity (Wang et al., 2016), suggesting that multiple regulatory processes work in conjunction to heighten risk for harsh discipline. Also, parents' executive function appears to explain variance in harsh discipline amid imbalances in reactivity across parents' biological systems (Deater-Deckard & Bell, 2017), suggesting that multiple biological systems need to be considered in understanding biomarkers that exacerbate harsh discipline.

In summary, evidence appears to suggest that 1) lower levels of executive function and higher levels of emotional and biological reactivity may be interrelated risk factors for harsh discipline; 2) emotional and cognitive effects on harsh discipline may be linear, with higher levels of negative emotional reactivity and lower levels of executive function conferring higher risk for harsh discipline; 3) biological effects on harsh discipline may be curvilinear, with greater extremes of dysregulation conferring higher risk for this type of discipline; and 4) emotional, cognitive, and biological factors (including multiple biological systems) may interact within individuals to increase risk for harsh discipline. These empirical trends can help guide research. For example, an important goal may be to determine how executive function interacts with emotional and biological reactivity in parenting contexts to predict harsh disciplinary behavior, accounting for key contextual factors such as culture and socioeconomic risk (Crandall et al., 2015).

## Parents' Self-Regulation, Parent-Child Coregulation, and Harsh Discipline

A major focus of research on developmental psychopathology is understanding how risk factors in parents and families are transmitted to children. One of the most common ways risk is transmitted is via patterns of face-to-face, interpersonal interactions. Parent-child coregulation has emerged as a critical feature of interaction patterns associated with harsh discipline, child maltreatment, and corresponding behavior problems in children (Brown et al., 2022; Lunkenheimer et al., 2017, 2018). Thus, a closer examination of how emotional, cognitive, and biological PSR shapes coregulation patterns could improve our understanding of the etiology of harsh discipline and its effects. Next, we review what we know about parent-child coregulation in relation to harsh discipline and the role of PSR in that link.

### The Coercive Cycle

The oldest and most common example of coregulation patterns relevant to harsh discipline is the coercive cycle because it involves a dyadic sequence of contingent behaviors by parents and children. Research on coercive interactions emerged from a desire to reduce parents' harsh discipline and children's antisocial behavior (Forgatch & Gewirtz, 2017; Patterson & Bank, 1989). The coercive cycle begins when the child misbehaves, the parent disciplines the child, and the child ignores or defies the discipline, which leads to escalation of negative emotion and behavior. Subsequently, either the parent or child gives up to end the aversive interaction, thus unintentionally reinforcing the other's negative behavior (Patterson & Bank, 1989). The cycle recurs and becomes more stable, and mutual aggression and rejection may escalate over time.

At its core, the coercive cycle hinges on a regulatory deficit in the parent: The parent does not maintain the disciplinary limit initially set, either because they failed to persist at a challenging goal, failed to delay gratification (e.g., electing short-term relief from an aversive situation rather than waiting for the child to comply), or failed to regulate the emotions associated with conflict (e.g., via emotional escalation or avoidance). Thus, a failure of PSR defines the coercive cycle, maintaining coercion and corresponding harsh discipline in the dyad over time.

Despite the centrality of the coercion model for the past 40 years (Forgatch & Gewirtz, 2017), we lack sufficient evidence on how individual and dyadic regulatory processes work together to predict harsh discipline. Though limited, studies using dyadic and dynamic methods illustrate that the coercive cycle reflects maladaptive coregulation. For example, coercive interactions are characterized by dysfunctional contingencies, with the coupling of children's noncompliance and parents' avoidance being stronger, whereas the coupling of parents' discipline and children's compliance is weaker (Dumas et al., 2001). Furthermore, parents with higher levels of hostility respond with discipline that is more variable and unpredictable, particularly when children are off task, suggesting that PSR difficulties are characteristic of the coercive cycle and contribute to ineffective discipline in real time (Lunkenheimer et al., 2016). Thus, researchers should examine specific PSR patterns, such as parents' emotional or behavioral variability, to understand how they are involved in links between harsh discipline and parent-child coregulation.

### **Harsh Discipline and Parent-Child Coregulation of Emotion, Cognition, and Biology**

In addition to the coercive cycle, other parent-child coregulation patterns are associated with harsh discipline. The coregulation of emotion associated with this type of discipline involves rigidity around negative affective states, with parent-child dyads more likely to express and remain stuck in these states for longer durations (Dumas et al., 2001). However, research also suggests more indiscriminate emotional patterns (i.e., mixed positive and negative emotion) in dyads with harsher parents, making it challenging for children to know what emotional response to expect (Dumas et al., 1995). Parents are more likely to show anger and spank in certain situations (e.g., after repeated misbehaviors; Holden et al., 1995) than in others, so examining specific contextual demands more closely could inform when such dyads display more rigid versus variable coregulation patterns (Lunkenheimer et al., 2016).

We know little about harsh discipline and coregulation of cognitive states. When harsher parents scaffold proactively, which requires greater cognitive effort, children respond less contingently to those behaviors and parents are less likely to reward children's responses (Lunkenheimer et al., 2017). Thus, coregulation with harsher parents could be characterized by the lower mutual application of effortful or executive cognition. More work is needed in this area; for example, researchers could test if harsh discipline and PSR are associated with cognitive coregulation, such as dyadic patterns of language, joint attention, planning, or problem-solving strategies.

The biological hyper- or hypoarousal characteristic of harsh discipline (Sturge-Apple et al., 2011) may interfere with the coregulation of autonomic nervous system and hypothalamic-pituitary-adrenal axis processes that support children's development (Porges & Furman, 2011). Parent-child dyads in which parents engage in harsh discipline and abuse more frequently have weaker or absent coordination of heart rate and respiratory sinus arrhythmia, which is thought to reflect lower attunement and less support for children's self-regulation (Lunkenheimer et al., 2018; Skowron et al., 2013). Biological synchrony also becomes more divergent in real time at higher levels of child abuse severity (e.g., children's respiratory sinus arrhythmia decreases while parents' respiratory sinus arrhythmia increases; Lunkenheimer et al., 2018), suggesting that extremes in parenting dysfunction may align

with extremes of dyadic biological dysregulation. In summary, harsh discipline appears to be associated with dyadic patterns of rigid or indiscriminate affect; the weaker coupling of cognitively effortful behaviors; and weaker, absent, or divergent biological synchrony.

## Implications for Intervention

Evidence suggests that regulatory processes are malleable in individual and family treatment (Granic et al., 2007), including in socioeconomically and racially diverse population trials (Prinz et al., 2016). Therefore, improvements in PSR may be a natural target for preventing harsh discipline and for intervention programs (Sanders & Mazzucchelli, 2013). However, most interventions target parenting skills but do not directly address PSR or coregulation patterns between parent and child. In a review of self-regulation interventions, researchers concluded that some of the most important gaps were the lack of focus on PSR, parent-child coregulation, and the integration of coregulation with parenting skill instruction (Murray & Rosanbalm, 2017).

When interventions do address PSR, they appear to be effective in treatment outcomes, including those related to harsh discipline. For example, the Triple-P Parenting Program, which has reduced physical abuse of children (Prinz et al., 2016), reflects regulatory processes by encouraging parents to appraise, monitor, and adjust their parenting behaviors in relation to realistic developmental norms of children's behavior. However, many interventions address only one domain of PSR. For example, the Parent Management Training Program - Oregon Model includes parents' emotion regulation only as a supporting, not as a core, component (Forgatch & Gewirtz, 2017). Ready4Routines promotes parents' executive function skills (Semenov & Zelazo, 2019), but not other domains. Considering the emotional, cognitive, biological, and behavioral domains of PSR could increase the effectiveness of interventions.

Although coregulation patterns per se are not a typical intervention target, some programs address dyadic processes or individual behaviors that could result in coregulatory changes. For example, parent management training and Triple-P target reducing parents' and children's coercive behaviors, which could weaken contingencies in the coercive cycle. Attachment and Biobehavioral Catch-Up (Dozier et al., 2018) and Parent-Child Interaction Therapy (Eyberg, 1988) target improved parental attunement by drawing parents' attention to children's cues in the moment, which could promote dyadic synchrony. Since dyadic patterns help stabilize individual behavior, families may relapse after treatment if these patterns are not addressed (Granic et al., 2007). Thus, we may be able to leverage research on PSR and coregulation processes to improve interventions designed to reduce the use of harsh discipline.

## Conclusion

In this article, we argue that to effectively reduce harsh discipline, we must identify mechanistic processes that drive real-time parental responses and are malleable in intervention programs. PSR processes are a prime candidate for what underlies and maintains the use of harsh discipline, and parent-child coregulation is a likely mechanism by



which this type of discipline and parents' regulatory difficulties affect children's adjustment. Researchers should acknowledge the multidimensional nature of regulatory processes and examine distinct PSR domains in the disciplinary context with clear definitions and ecological validity to understand more fully their respective contributions to dyadic and children's outcomes. This approach can inform the etiology of children's adjustment related to harsh discipline and boost our knowledge of specific, malleable PSR intervention targets aimed at reducing this type of discipline.

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## References

- Azar ST, Reitz EB, & Goslin MC (2008). Mothering: Thinking is part of the job description: Application of cognitive views to understanding maladaptive parenting and doing intervention and prevention work. *Journal of Applied Developmental Psychology*, 29(4), 295–304. 10.1016/j.appdev.2008.04.009
- Brown KM, Pérez-Edgar K, & Lunkenheimer E (2022). Understanding how child temperament, negative parenting, and dyadic parent-child behavioral variability interact to influence externalizing problems. *Social Development*, 31(4), 1020–1041. 10.1111/sode.12601 [PubMed: 36569337]
- Crandall A, Deater-Deckard K, & Riley AW (2015). Maternal emotion and cognitive control capacities and parenting: A conceptual framework. *Developmental Review*, 36(June), 105–126. 10.1016/j.dr.2015.01.004 [PubMed: 26028796]
- Deater-Deckard K, & Bell MA (2017). Maternal executive function, heart rate, and EEG alpha reactivity interact in the prediction of harsh parenting. *Journal of Family Psychology*, 31(1), 41–50. 10.1037/fam0000286 [PubMed: 28165280]
- Deater-Deckard K, Sewell MD, Petrill SA, & Thompson LA (2010). Maternal working memory and reactive negativity in parenting. *Psychological Science*, 21(1), 75–79. 10.1177/0956797609354073 [PubMed: 20424026]
- Deater-Deckard K, Wang Z, Chen N, & Bell MA (2012). Maternal executive function, harsh parenting, and child conduct problems. *Journal of Child Psychology and Psychiatry*, 53(10), 1084–1091. 10.1111/j.1469-7610.2012.02582.x [PubMed: 22764829]
- Diamond LM, & Aspinwall LG (2003). Emotion regulation across the life span: An integrative perspective emphasizing self-regulation, positive affect, and dyadic processes. *Motivation and Emotion*, 27(2), 125–156. 10.1023/A:1024521920068
- Dopke CA, & Milner JS (2000). Impact of child noncompliance on stress appraisals, attributions, and disciplinary choices in mothers at high and low risk for child physical abuse. *Child Abuse & Neglect*, 24(4), 493–504. 10.1016/S0145-2134(00)00110-1 [PubMed: 10798839]
- Dozier M, Roben CKP, Caron E, Hoyer J, & Bernard K (2018). Attachment and Biobehavioral Catch-up: An evidence-based intervention for vulnerable infants and their families. *Psychotherapy Research*, 28(1), 18–29. 10.1080/10503307.2016.1229873 [PubMed: 27729003]
- Dumas JE, LaFreniere PJ, & Serketich WJ (1995). "Balance of power": A transactional analysis of control in mother-child dyads involving socially competent, aggressive, and anxious children. *Journal of Abnormal Psychology*, 104(1), 104–113. 10.1037/0021-843X.104.1.104 [PubMed: 7897032]
- Dumas JE, Lemay P, & Dauwalder JP (2001). Dynamic analyses of mother-child interactions in functional and dysfunctional dyads: A synergetic approach. *Journal of Abnormal Child Psychology*, 29(4), 317–329. 10.1023/A:1010309929116 [PubMed: 11523837]
- Eyberg S (1988). Parent-Child Interaction Therapy: Integration of traditional and behavioral concerns. *Child & Family Behavior Therapy*, 10(1), 33–46. 10.1300/J019v10n01\_04

- Forgatch MS, & Gewirtz AH (2017). The evolution of the Oregon Model of Parent Management Training: An intervention for antisocial behavior in children and adolescents. In Weisz JR & Kazdin AE(Eds.), *Evidence-based psychotherapies for children and adolescents* (3rd ed., pp. 85–102). Guilford Press.
- Gershoff ET, Lee SJ, & Durrant JE (2017). Promising intervention strategies to reduce parents' use of physical punishment. *Child Abuse & Neglect*, 71(September), 9–23. 10.1016/j.chiabu.2017.01.017 [PubMed: 28162793]
- Granic I, O'Hara A, Pepler D, & Lewis MD (2007). A dynamic systems analysis of parent-child changes associated with successful “real-world” interventions for aggressive children. *Journal of Abnormal Child Psychology*, 35(5), 845–857. 10.1007/s10802-007-9133-4 [PubMed: 17549621]
- Hajal NJ, & Paley B (2020). Parental emotion and emotion regulation: A critical target of study for research and intervention to promote child emotion socialization. *Developmental Psychology*, 56(3), 403–417. 10.1037/dev0000864 [PubMed: 32077713]
- Henschel S, de Bruin M, & Möhler E (2014). Self-control and child abuse potential in mothers with an abuse history and their preschool children. *Journal of Child and Family Studies*, 23(5), 824–836. 10.1007/s10826-013-9735-0
- Holden GW, Coleman SM, & Schmidt KL (1995). Why 3-year-old children get spanked: Parent and child determinants as reported by college-educated mothers. *Merrill-Palmer Quarterly*, 40(3), 431–452. <http://www.jstor.org/stable/23087935>
- Lansford JE (2022). Annual research review: Cross-cultural similarities and differences in parenting. *Journal of Child Psychology and Psychiatry*, 63(4), 466–479. 10.1111/jcpp.13539 [PubMed: 34763373]
- Lorber MF, O'Leary SG, & Kendziora KT (2003). Mothers' overreactive discipline and their encoding and appraisals of toddler behavior. *Journal of Abnormal Child Psychology*, 31(5), 485–494. 10.1023/A:1025496914522 [PubMed: 14561057]
- Lunkenheimer E, Busuito A, Brown KM, & Skowron EA (2018). Mother-child coregulation of parasympathetic processes differs by child maltreatment severity and subtype. *Child Maltreatment*, 23(3), 211–220. 10.1177/1077559517751672 [PubMed: 29325428]
- Lunkenheimer E, Lichtwarck-Aschoff A, Hollenstein T, Kemp CJ, & Granic I (2016). Breaking down the coercive cycle: How parent and child risk factors influence real-time variability in parental responses to child misbehavior. *Parenting*, 16(4), 237–256. 10.1080/15295192.2016.1184925 [PubMed: 28190978]
- Lunkenheimer E, Ram N, Skowron EA, & Yin P (2017). Harsh parenting, child behavior problems, and the dynamic coupling of parents' and children's positive behaviors. *Journal of Family Psychology*, 31(6), 689–698. 10.1037/fam0000310 [PubMed: 28333490]
- Martini TS, Root CA, & Jenkins JM (2004). Low and middle income mothers' regulation of negative emotion: Effects of children's temperament and situational emotional responses. *Social Development*, 13(4), 515–530. 10.1111/j.1467-9507.2004.00281.x
- Mills-Koonce WR, Propper C, Garipey J-L, Barnett M, Moore GA, Calkins S, & Cox MJ (2009). Psychophysiological correlates of parenting behavior in mothers of young children. *Developmental Psychobiology* 51(8), 650–661. 10.1002/dev.20400 [PubMed: 19739135]
- Milner JS (2003). Social information processing in high-risk and physically abusive parents. *Child Abuse & Neglect*, 27(1), 7–20. 10.1016/S0145-2134(02)00506-9 [PubMed: 12510028]
- Murray DW, & Rosanbalm K (2017). Current gaps and future directions for self-regulation intervention research: A research brief (OPRE Report No. 2017-93). Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. [https://www.acf.hhs.gov/sites/default/files/documents/opre/3\\_research\\_gaps\\_reduced.pdf](https://www.acf.hhs.gov/sites/default/files/documents/opre/3_research_gaps_reduced.pdf)
- Patterson GR, & Bank CL (1989). Some amplifying mechanisms for pathologic processes in families. In Gunnar MR & Thelen E (Eds.), *Systems and development* (pp. 167–209). Erlbaum.
- Porges SW, & Furman SA (2011). The early development of the autonomic nervous system provides a neural platform for social behaviour: A polyvagal perspective. *Infant and Child Development*, 20(1), 106–118. 10.1002/icd.688 [PubMed: 21516219]

- Prinz RJ, Sanders MR, Shapiro CJ, Whitaker DJ, & Lutzker JR (2016). Population-based prevention of child maltreatment: The U.S. Triple P system population trial. *Prevention Science*, 17, 410–416. 10.1007/s11121-016-0631-x [PubMed: 26780665]
- Rodriguez CM, & Green AJ (1997). Parenting stress and anger expression as predictors of child abuse potential. *Child Abuse & Neglect*, 21(4), 367–377. 10.1016/S0145-2134(96)00177-9 [PubMed: 9134265]
- Sanders MR, & Mazzuchelli TG (2013). The promotion of self-regulation through parenting interventions. *Clinical Child and Family Psychology Review*, 16(1), 1–17. 10.1007/s10567-013-0129-z [PubMed: 23397366]
- Sawrikar V, & Dadds M (2018). What role for parental attributions in parenting interventions for child conduct problems? Advances from research into practice. *Clinical Child and Family Psychology Review*, 21(1), 41–56. 10.1007/s10567-017-0243-4 [PubMed: 28871489]
- Semenov AD, & Zelazo PD (2019). Mindful family routines and the cultivation of executive function skills in childhood. *Human Development*, 63, 112–131. 10.1159/000503822
- Skowron EA, Cipriano-Essel E, Benjamin LS, Pincus AL, & Van Ryzin MJ (2013). Cardiac vagal tone and quality of parenting show concurrent and time-ordered associations that diverge in abusive, neglectful, and non-maltreating mothers. *Couple & Family Psychology: Research and Practice*, 2(2), 95–115. 10.1037/cfp0000005 [PubMed: 24729945]
- Straus MA, & Mouradian VE (1998). Impulsive corporal punishment by mothers and antisocial behavior and impulsiveness of children. *Behavioral Sciences & The Law*, 16(3), 353–374. 10.1002/(SICI)1099-0798(199822)16:3<353::AID-BSL313>3.0.CO;2-O [PubMed: 9768466]
- Sturge-Apple ML, Rogge RD, Skibo MA, Peltz JS, & Suor JH (2015). A dual-process approach to the role of mother's implicit and explicit attitudes toward their child in parenting models. *Developmental Psychology*, 51(3), 289–300. 10.1037/a0038650 [PubMed: 25621755]
- Sturge-Apple ML, Skibo MA, Rogosch FA, Ignjatovic Z, & Heinzelman W (2011). The impact of allostatic load on maternal sympathovagal functioning in stressful child contexts: Implications for problematic parenting. *Development and Psychopathology*, 23(3), 831–844. 10.1017/S0954579411000332 [PubMed: 21756435]
- Thelen E, & Smith LB (1998). Dynamic systems theories. In Damon W & Lerner RM (Eds.), *Handbook of child psychology: Theoretical models of human development* (pp. 563–634). John Wiley & Sons.
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development* (A/RES/70/1). [http://www.un.org/ga/search/view\\_doc.asp?symbol%A/RES/70/](http://www.un.org/ga/search/view_doc.asp?symbol%A/RES/70/)
- Vohs KD, & Baumeister RF (2016). *Handbook of self-regulation: Research, theory, and applications* (3<sup>rd</sup> ed.). Guilford Press.
- Wang Z, Deater-Deckard K, & Bell MA (2016). The role of negative affect and physiological regulation in maternal attribution. *Parenting: Science & Practice*, 16(3), 206–218. 10.1080/15295192.2016.1158604 [PubMed: 27667969]
- Wang H, Mai X, Han ZR, Hu Y, & Lei X (2018). Linkage between parent-child frontal resting electroencephalogram (EEG) asymmetry: The moderating role of emotional parenting. *Journal of Child and Family Studies*, 27(9), 2990–2998. 10.1007/s10826-018-1121-5
- Wilson SR, Rack JJ, Shi X, & Norris AM (2008). Comparing physically abusive, neglectful, and non-maltreating parents during interactions with their children: A meta-analysis of observational studies. *Child Abuse & Neglect*, 32(9), 897–911. 10.1016/j.chiabu.2008.01.003 [PubMed: 18950859]