

Emotion regulation, risk, and psychopathology

Pamela M. Cole¹ and Kirby Deater-Deckard²

¹The Pennsylvania State University, USA; ²Virginia Polytechnic Institute and State University, USA

Conceptualizing emotion regulation has been a persistent scientific and clinical challenge and yet there is no question that the concept dominates the clinical research literature. Emotional dysregulation is regarded as a core aspect of most forms of psychopathology (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Bradley, 2003; Cicchetti, Ackerman, & Izard, 1995; Cole, Michel, & Teti, 1994; Gross & Muñoz, 1995; Keenan, 2000; Kring & Werner, 2004). However, in order to advance the scientific evidence for early identification of risk and prevention of disorder there remains a need for greater precision in defining emotion regulation and specifying the features of emotional development – in terms of both negative and positive emotions – that lead to emotional dysregulation. For example, in what ways does the emotional functioning of an infant who has genetic risk for anxiety disorder develop differently over the course of a lifetime than an infant without that risk? What aspects of emotional development distinguish the emotional functioning of a child without such risk from one who is at risk but does not develop the disorder and another at risk child who does develop the disorder? The broad goal of this special issue of the *Journal* is to present new and innovative studies that begin to address questions like these, and that push our thinking forward in the area of emotion regulation, risk, and psychopathology.

To make progress in this area of inquiry, it is critical for the fields of child psychology and psychiatry to support research that addresses the conceptual and definitional problems that concern emotion regulation researchers (Cole, Martin, & Dennis, 2004), and that advances our understanding of the ways that emotional functioning contributes to developmental trajectories of mental health and psychopathology (Cole & Hall, 2008). One of the key issues for making progress lies in the challenge of assessing regulatory processes, as it is increasingly clear that emotional activation or reaction may not be disentangled from emotion regulation. Emotions are regulatory and inherently regulated, such that it is difficult to ascertain – theoretically and methodologically – the independence of emotion regulation as a construct. This view of emotion and emotion regulation as inseparable is supported by both functional (Campos, Frankel, & Camras, 2004)

and neurobiological perspectives (Thompson, Lewis, & Calkins, 2008). Yet, from a different vantage point, many researchers contend that it is scientifically and clinically meaningful to have a concept that accounts for the ways that individuals manage their emotional responses (Goldsmith, Pollak, & Davidson, 2008; Ochsner & Gross, 2008; Posner & Rothbart, 2006). Thus, it may be that there are aspects of emotional functioning that can be construed as emotion regulation (and self-regulation more broadly) may be fruitful. However, this work must be approached in two ways: (1) multiple methods must be used to test theoretically driven predictions about relations among variables to infer regulatory processes (Cole et al., 2004) and (2) the samples and measures used must embrace the full range of human functioning, from the various pathways comprising typical development to the various forms of atypicality represented by the presence of and risk for psychopathology (Cole & Hall, 2008).

A contemporary view regards regulatory phenomena as an integration of biological and behavioral processes, including emotion, attention, cognition, and action (Bell & Deater-Deckard, 2007; Thompson et al., 2008). According to this view, risk factors in the environment and within the individual contribute to the development of psychopathology, in part, through their influences on the capacities and strategies of self-regulation, many of which involve executive processes, such as attention control. When effective, executive processes allow the individual to modulate internal processes so that the child can both learn from an experience and interact in socially appropriate ways. The ability to adjust internal processes (e.g., thoughts, emotions, respiration) in coordination with social demands and opportunities is thought to be central to early childhood mental health and school readiness (Blair, 2002). When ineffective, the capacity for emotion regulation becomes constrained – emotions organize behavior in ways that are problematic (Cole & Hall, 2008). Executive control influences the perception, interpretation, and reinterpretation of situations and experiences that modulate emotion. Self-regulation does the work of striking a balance between protecting the self from misfortune and promoting opportunity for positive experiences.

In the current issue we find evidence for relations among putative indices of emotion regulation that

Conflict of interest statement: No conflicts declared.

© 2009 The Authors

Journal compilation © 2009 Association for Child and Adolescent Mental Health.

Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA

begin to address the way in which component processes relate to risk and psychopathology. Hastings et al. (this issue) report distinct patterns of vagal activity (RSA) in youth with externalizing vs. internalizing problems, specifically in the link between vagal activity and subjective emotional experience in the face of emotion-evoking stimuli. Adding to this evidence, Vasilev and colleagues (this issue) demonstrate that developmental patterns of vagal activity predict the degree to which children have difficulties with emotion regulation by the time they are youth.

These studies underscore the need for longitudinal research examining how relations among aspects of self-regulation develop in both typical and at-risk populations, especially given evidence that the cognitive and physiological systems involved in emotion regulation are affected by risk exposure in early childhood. For instance, three papers in the current issue examine the potential impact of exposure to hostility on physiological indices of emotion regulation. Davies et al. (this issue) present evidence that toddlers' emotional reactivity mediates the link between exposure to inter-parental conflict and children's neuroendocrine and cardiac indices of emotion regulation. Moore (this issue) reports that prior exposure to anger in typically developing infants alters the RSA response of infants, suggesting how early stress may affect the development of emotion regulation. Similarly, Schuetze et al. (this issue) show that typical vagal patterns are altered when infants have a history of prenatal cocaine exposure. Each points toward the potential for early stress to alter the processes that underlie healthy emotion regulation.

In addition to appreciating the links between internal physiological processes and emotion regulation, it is important to recognize the major role of the social environment in the integrated development of self-regulation – with emotion regulation figuring prominently. Attachment and socialization theories highlight the importance of immediate caregivers, family members, and peers, as contributors to the learning that leads to a repertoire of cognitive and behavioral strategies for regulating emotion (Fox & Calkins, 2003; Halberstadt & Eaton, 2002). There is a constant need to regulate competing needs for achieving a sense of psychological security and emotionally rewarding experiences in relationships, while monitoring and trying to avoid harmful experiences of harsh, rejecting interactions and relationships. From early in life, interactions and relationships with caregivers contribute to the systems and strategies of self-regulation through the development of co-regulation between caregiver and child, and beliefs and behaviors that allow children to strike a balance between safety and arousal (Bowlby, 1969; Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001).

Thus, chronic neglect and rejection influences the development of psychopathology in children, in part through its impact on psychological and

physiological systems of regulation. The papers in the current issue support the view that harsh reactive parenting behavior modifies processes involved in effective emotion regulation; therefore, well-planned proactive parenting behavior should help children modulate internal states and provide emotion regulation strategies (e.g., Gardner, Sonuga-Barke, & Sayal, 1999). That is, the quality of parent-child interaction, including its emotional quality, promotes a child's ability to regulate emotion – or places it at risk. Just as Moore (this issue) showed the potential disruptiveness of anger exposure on the processes that underlie emotion regulation, Zeman et al. (this issue) showed that family cohesion is associated with less severe psychopathology in hospitalized youth and that symptom patterns are associated with distinctive types of emotional difficulties. These studies should urge us to understand the links between early developmental relations between social interaction and regulation of internal processes and distinct clinical outcomes.

Peers are no less important than caregivers to a consideration of risk and emotion regulation. Children are incredibly adept at taking notice of each other's emotions and behaviors, and by the time children start school (and possibly even before) they have learned to minimize and avoid social interaction with their peers who are more extreme in their emotional displays (be it fearfulness, anger, or rampant enthusiasm). Therefore, it is no surprise that there are strong links between troubled peer relations and difficulties in cognitive control and emotion regulation (Melnick & Hinshaw, 2000). It is well established that peer problems are a risk factor. However, friendship support is associated with less severe symptoms, and less severe symptoms are associated with better emotion regulation skills (Zeman et al., current issue). However, we do not yet understand the developmental sequence of these processes (but see Leadbeater & Hoglund, 2009) – an important direction for future research.

What will be exciting is research that links cognitive, social, and behavioral indices of emotion regulation with neural activity. Two papers in the current issue raise such possibilities, each suggesting that a particular aspect of the event-related potential (ERP) taps a different aspect of information processing. Reeb-Sutherland and colleagues (this issue) linked a developmental history of behavioral inhibition with the later presence of anxiety disorders if there was heightened attention to novel stimuli, indicated as higher P3 amplitude in the ERP. Dennis and colleagues (this issue) suggest that the late positive potential (LPP) may tap a later phase of emotion processing that is associated with effortful emotion regulation.

Further innovations will be found in research examining genotypic variation. Two papers in the current issue address the interplay of genetic and environmental influences by studying different

periods of development. Kochanska et al. (this issue) report a gene–environment interaction between the serotonin transporter gene and insecure attachment on young children’s self-regulation. Zimmerman et al. (this issue) conducted a strikingly similar study but with adolescents, finding a similar interaction effect between the serotonin transporter gene and insecure attachment on emotion regulation and maladjustment. If replicated, these findings implicate important connections between serotonin neurotransmitter function and emotion regulation for those whose relationships with their caregivers put them at risk for maladjustment – in early childhood, as well as in adolescence.

Although assessment of genetic and neurobiological and cognitive processing is becoming central to emotion regulation research, there also is much to be learned through the careful analysis of the ongoing behavior stream. Indeed, it is to the observer that the concept of emotion regulation has made so much scientific and clinical sense. We see a person experience a blocked goal, e.g., a child may not have her favorite toy at school. Because we know she adores that toy, we infer from her appropriate behavior – let’s say she suggests to the child with the toy that they create a game together with the toy – that she managed her frustration well. Carefully constructed micro-analyses of the behavior stream can be used to infer emotion regulation processes. For example, Manian and Bornstein (this issue) used infants’ transitions between states, which vary as a function of their mothers’ depression status, to suggest ways that maternal depression might contribute to emotion dysregulation. With adolescents, Sheeber et al. (this issue) also used micro-analyses to specify qualities of emotion that are associated with depression, revealing that duration more than frequency and intensity distinguishes depressed from healthy adolescents.

But do the developmental processes that lead to adaptive or maladaptive emotion regulation operate in the same way, or in different ways, across the range and levels of severity of child and adolescent disorders? To answer this question, it is essential to encourage research that includes a broader variety of populations than have been studied. Included in this range should be studies of the emotional development of individuals with significant clinical problems. Generally, research that has taken a developmental perspective on emotion regulation has delineated biological and environmental risks associated with heightened negative emotion. Yet, arguably many individuals with various forms of psychopathology have heightened negative emotion. To move forward there is a critical need for more specific information about how emotional functioning differs among different psychopathology profiles and how these develop. For instance, how is an individual with depression and borderline features different from an individual with depression but who never evinces borderline

features? In particular, it will be worthwhile to specify aspects of atypical emotional functioning that can be detected prior to the onset of disorders, so that we might identify problems earlier in development and intervene before they become well established (Cole, Luby, & Sullivan, 2008).

References

- Bell, M.A., & Deater-Deckard, K. (2007). Biological systems and the development of self-regulation: Integrating behavior, genetics, and psychophysiology. *Journal of Developmental and Behavioral Pediatrics*, 28, 409–420.
- Berenbaum, H., Raghavan, C., Le, H., Vernon, L.L., & Gomez, J.J. (2003). A taxonomy of emotional disturbances. *Clinical Psychology: Science and Practice*, 10, 206–226.
- Bowlby, J. (1969). *Attachment and loss, Volume 1*. London: Hogarth.
- Bradley, S.J. (2003). *Affect regulation and the development of psychopathology*. New York: Guilford.
- Blair, C.B. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children’s functioning at school entry. *American Psychologist*, 57, 111–127.
- Campos, J.J., Frankel, C.B., & Camras, L. (2004). On the nature of emotion regulation. *Child Development*, 75, 377–394.
- Cicchetti, D., Ackerman, B.P., & Izard, C.E. (1995). Emotions and emotion regulation in developmental psychopathology. *Development and Psychopathology*, 7, 1–10.
- Cole, P.M., & Hall, S.E. (2008). Emotion dysregulation as a risk factor for psychopathology. In T. Beauchaine, & S. Hinshaw (Eds.), *Developmental psychopathology* (pp. 265–298). Hoboken, NJ: Wiley & Sons.
- Cole, P.M., Luby, J., & Sullivan, M.W. (2008). Emotions and the development of childhood depression: Bridging the gap. *Child Development Perspectives*, 2, 141–148.
- Cole, P.M., Martin, S.E., & Dennis, T.A. (2004). Emotion regulation as a scientific construct: Challenges and directions for child development research. *Child Development*, 75, 317–333.
- Cole, P.M., Michel, M.K., & Teti, L.O. (1994). The development of emotion regulation and dysregulation: A clinical perspective. In N.A. Fox (Ed.), *The development of emotion regulation: Biological and behavioral considerations. Monographs of the Society for Research in Child Development*, 59 (2–3, Serial No. 240), 73–100.
- Fox, N.A., & Calkins, S.D. (2003). The development of self-control of emotion: Intrinsic and extrinsic influences. *Motivation and Emotion*, 27, 7–26.
- Gardner, F., Sonuga-Barke, E., & Sayal, K. (1999). Parents anticipating misbehaviour. *Journal of Child Psychology and Psychiatry*, 40, 1185–1196.
- Goldsmith, H.H., Pollak, S.D., & Davidson, R.J. (2008). Developmental neuroscience perspectives on emotion regulation. *Child Development Perspectives*, 2, 132–140.
- Gross, J.J., & Muñoz, R.F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice*, 2, 151–164.

- Halberstadt, A.G., & Eaton, K.L. (2002). A meta-analysis of family expressiveness and children's emotion expressiveness and understanding. *Marriage and Family Review*, 34, 35–62.
- Jaffe, J., Beebe, B., Feldstein, S., Crown, C.L., & Jasnow, M.D. (2001). Rhythms of dialogue in infancy. *Monographs of the Society for Research in Child Development*, 66 (No. 2, Serial No. 265).
- Keenan, K. (2000). Emotion dysregulation as a risk factor for child psychopathology. *Clinical Psychology: Science and Practice*, 7, 418–434.
- Kring, A.M., & Werner, K.H. (2004). Emotion regulation and psychopathology. In P. Philippot, & R.S. Feldman (Eds.), *The regulation of emotion* (pp. 359–385). Mahwah, NJ: Erlbaum.
- Leadbeater, B.J., & Hoglund, W.L.G. (2009). The effects of peer victimization and physical aggression on changes in internalizing between first and third grade. *Child Development*, 80, 843–859.
- Melnick, S.M., & Hinshaw, S.P. (2000). Emotion regulation and parenting in AD/HD and comparison boys: Linkages with social behaviors and peer preference. *Journal of Abnormal Child Psychology*, 28, 73–86.
- Ochsner, K.N., & Gross, J.J. (2008). Cognitive emotion regulation: Insights from social cognitive and affective neuroscience. *Current Directions in Psychological Science*, 17, 153–158.
- Posner, M.I., & Rothbart, M.K. (2006). *Educating the human brain*. Washington, DC: APA.
- Thompson, R.A., Lewis, M., & Calkins, S.D. (2008). Reassessing emotion regulation. *Child Development Perspectives*, 2, 124–131.

Manuscript accepted 25 August 2009

Copyright of Journal of Child Psychology & Psychiatry is the property of Blackwell Publishing Limited and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.