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Moving ahead in the study of the development of emotion regulation

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Abstract

This special section on the development of emotion regulation highlights several important new directions for research. Specifically, the findings of these studies indicate that: (1) emotion regulation develops across the lifespan and not just in early childhood and does so in complex ways, (2) it is necessary to distinguish among emotions to fully understand emotion regulation, and (3) at all ages emotion regulation is socially regulated. In addition, the limitations of the studies point to additional new directions, including the (4) need for a sophisticated conceptualization of the role of gender, (5) the acute need to incorporate cultural variations into the research, and (6) the need to define emotion regulation as a process.

It has been 20 years since Ross Thompson's (1994) highly cited and thoughtful "search for a definition" of emotion regulation and 10 years since *Child Development* (2004) published a series of articles discussing persistent conceptual and methodological challenges for the study of the development of emotion regulation. Despite a prodigious corpus of published research invoking this construct, we still lament the lack of a unifying approach to defining emotion regulation. Nonetheless, across many disciplines and sub-disciplines emotion regulation is regarded as a core and crucial aspect of human growth and development. It is central in adult well-being (Gross & John, 2003), child competence (Blair, 2002) and to conceptualizations of many forms of disease (e.g., Thayer, Åhs, Fredrickson, Sollers, & Wager, 2012) and psychopathology (Kring & Sloan, 2009). Clearly, we must strive to understand its nature and development. The diverse set of studies comprising this special section—their methods, findings, and limitations—highlight important new directions, and point to others, for this area of study. In this commentary, I elaborate on three themes reinforced by this set of articles and suggest three additional themes that also must be built into our future work.

Three new directions highlighted in this special section

The six studies presented in this issue vary widely in terms of the age ranges studied, the ways that emotion regulation was inferred, and the methods used to test hypotheses. Taken together, their findings reinforce the value of certain new directions in the study of the development of emotion regulation. These can be summarized by three important and intersecting themes:

1. Emotion regulation changes throughout the lifespan and those changes require complex conceptualizations.
2. When thinking about how emotion regulation changes over the lifespan, it is necessary to appreciate that the specific functions of emotions may influence their regulation.
3. At all ages, emotions and their regulation cannot be understood outside of their social context.

Developmental change requires complex conceptualizations

Zimmermann and Thompson (2014) note in the special section's introduction that research on the development of emotion regulation has concentrated on infancy and early childhood to the relative neglect of other periods of the lifespan. The six studies in this special section clearly portray the fact that emotion regulation is a lifespan developmental process. Moreover, its nature is complex.

In taking a developmental perspective, studies of emotion regulation often emphasize the role of caregivers in regulating infant and young children's negative emotions and socializing young children's emotions as precursors of the development of children's independent ability to regulate their own emotions (Eisenberg, Cumberland, & Spinrad, 1998; Kopp, 1989). The critical importance of the early development of self-regulation for lifespan development has surely sustained this emphasis (Mischel, Shoda, & Rodriguez, 1989; Moffitt et al., 2011). Nonetheless, emotion regulation develops across the lifespan. Youth enter adolescence with skills and knowledge that is evidenced in the school age years. However, the marked and interrelated biological and social changes of adolescence afford new challenges and opportunities for experiencing and regulating emotions. Two papers in this group reveal the complexity of adolescence as a unique period in the development of emotion regulation.

Guyer and her colleagues (2014) used age 13 years to classify adolescents into younger and older groups, roughly capturing the periods leading into and achieving puberty. To study cross-sectional differences in emotions associated with anticipating and receiving peer social acceptance, they devised a creative chat room

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task that increases the ecological validity of their stimuli in fMRI studies of adolescent social anxiety and disorder. Their findings suggest that the older adolescent male group derived more positive experience from peer acceptance than their younger counterparts, whereas for girls the gender of peers was more influential than peer age. This raises interesting questions about the role of puberty in the development of emotion regulation. How do the neurobiological changes of adolescence and the associated differences in social experiences with peers affect adolescent emotion cognition and experience (e.g., Scherf, Behrmann, & Dahl, 2011)? The answers will help us understand better what adolescents are regulating as well as how they go about it.

Zimmermann and Iwanski (2014) investigated how adolescents and adults believe they regulate anger, fear, and sadness. Their cross-sectional study used finely differentiated age groups ranging across adolescence and adulthood. Among their findings, they show that 11-year-olds reported *greater* use of adaptive emotion regulation strategies than 15-year-olds (for anger and sadness) but less than 19-year-olds. These results in the perceived use of emotion regulation strategies clearly indicate that simple developmental models (e.g., that the size or effectiveness of the regulatory strategy repertoire increases with age) are not sufficient to explain such developmental changes. Moreover, the findings are interesting to consider in light of the changes in the developmental niche of adolescents as they proceed through puberty. Their sensitivities to certain types of interactions (e.g., peer evaluations) affect their emotional lives and during some periods within adolescence it may be more challenging to engage in certain adaptive strategies. Thus, it is important to take the Zimmermann and Iwanski findings and use them to devise studies that place these self-reports in their neurobiological and social contexts.

The critical importance of social context in assessment of an individual's emotional life at any point in the lifespan is demonstrated in English and Carstensen's (2014, this issue) study. They infer emotion regulation based on the social networks that adults create for themselves. They revealed the fascinating tendency for adults to sculpt their social networks over time, reducing them but doing so by increasing the opportunity for experiencing positive emotions. This finding should shift our attention away from a heavy emphasis on adult internal emotion regulation strategies (e.g., cognitive reappraisal and emotion suppression) and toward an emphasis on how adult autonomy and maturity influences the selection of social niches that reduce interpersonal conflict or other negative emotion. Regulation in this sense is inferred from the social choices that adults make rather than from the efforts adults make once they experience emotion (see also Aldao & Dixon-Gordon, 2014). Notably, each of these studies examined emotion and its regulation in social context, which leads to the second direction these studies emphasize.

Emotions are self- and socially-regulated throughout the lifespan

A prevailing view of the development of emotion regulation is that it changes from being socially- to being self-regulated over the course of childhood (Kopp, 1989; Sameroff, 2010). Infants have very limited capacity to regulate their emotions and are ultimately dependent on their caregivers to meet their goals for well-being. This reliance on others lessens over time as children gain the ability to engage in self-regulation of emotion. The Meyer et al. (2014) article delves into how mothers regard their own and their children's emotions, showing that the value they place on emotion and its regulation likely influences parental behavior toward their young children when they experience emotions and that this in turn may influence the self-regulatory strategies preschool age children use when coping with emotional situations. This interesting study revealed correlations among mothers' reports of each of these factors, setting the stage for longitudinal observational studies that test the developmental prediction.

However, even as the capacity for self-regulation develops, social relationships continue to play a large and significant regulatory role throughout the lifespan (Butler & Randall, 2013; Coan, 2008; Hofer, 1994). Attachment theorists have most widely embraced this perspective but the importance of social context and social relationships in lifespan development of emotion regulation need not be limited to an attachment theory perspective. Emotion regulation in social context was examined in five of the six studies, with one (Meyer et al., 2014) purposefully using non-social contexts in order to control for variability due to social context. As discussed, adolescents anticipate and are sensitive to their peers in terms of the process of forming social relationships and over the course of adulthood, people become increasingly more selective about their social networks, choosing smaller but more emotionally satisfying, less negative relationships. But let us also consider the intriguing interpersonal nuances suggested by the Spangler and Zimmermann (2014) study. They found that secure infant attachment predicted *increased* communication of angry emotion by adolescents to their mothers during a task designed to frustrate their work as a team. In contrast to the view that as we age we are better regulators, this study introduces the possibility that the context of a safe or secure relationship may allow a youth to openly convey frustration whereas insecurity that has endured from infancy to adolescence may make such emotional honesty more risky. This study may not have revealed this interesting finding if it had focused on "negative" emotion instead of attempting to observe emotion-related behavior in situations that were specifically designed to consider emotion regulation in anger and fear contexts separately. The value of distinguishing among negative emotions leads to the third theme that the special section underscores—emotion specificity.

The nature of an emotion is a factor in its regulation

There is considerable debate about whether we are biologically prepared with unique physiological profiles for basic emotions such as anger and sadness and fear or whether different emotions arise from specific cognition-context conditions (Barrett, 2006; Izard, 2009; Lench, Flores, & Bench, 2011). Despite the point of origin—basic neural paths or cognitive constructions—emotion specificity is an unavoidable feature of the landscape of human emotion. Three of the studies in this special section distinguished among negative emotions, adopting positions that are consistent with a functional perspective on emotional development (Barrett & Campos, 1987; Saarni, Campos, Camras, & Witherington, 2008). From this viewpoint, each emotion serves a different adaptive function; anger is defined by the appraisal that a goal of personal significance has been blocked and readiness to act with increased effort to overcome the obstacle and achieve the goal, whereas sadness is defined by the appraisal that a goal of personal significance is lost and readiness to relinquish the goal by giving

up effort. Each of these emotions then elicits different reactions from others (Walle & Campos, 2012), has different consequences (Widen & Russell, 2010), and may benefit from different regulatory strategies (Dennis & Kelemen, 2009).

Consistent with this perspective, Waters and Thompson (2014) showed that elementary school age children rated problem solving as more effective for regulating anger and support seeking as more effective for regulating sadness. The self-reported expectations of school age children therefore invite research that has children experience different situational and social contexts that elicit specific emotions and that examines relations between these beliefs and actual coping with anger and sadness situations. For example, coping with anger through problem-solving may make particular sense when a child is alone, but we need to be able to link that coping with the anger securely attached adolescents expressed to their mothers, which was conceptualized by Spangler and Zimmermann (2014) as social regulation. Zimmermann and Iwanski (2014), who studied adolescents and adults, reported that even at these ages beyond childhood, support seeking, as well as passivity and avoidance, were used more often to regulate sadness compared to anger. There are likely important variations in context that need to be incorporated into future research.

Zimmermann and Iwanski (2014) also reported a novel finding, that more worrisome strategies, such as blaming others or brooding, were reported more for anger than sadness. Moreover, they found no age difference in the reported use of ''dysfunctional rumination'' as a strategy for regulating anger, despite the wide age range studied (11 through 50 years). This finding reminds us that, from the viewpoint of developmental psychopathology, we cannot truly understand the typical development of emotion regulation strategies without studying atypicality. What makes rumination dysfunctional? There is debate about the potential that rumination can be a natural part of the problem-solving process; reflecting upon and brooding about a source of frustration (e.g., a conflict with a friend) may be preferable to action, especially if the anger increases the risk of angry verbalizations (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Moreover, as we consider whether emotion regulation strategies are dysfunctional, we must maintain the developmental perspective; a strategy that is maladaptive for an adult in a particular situation may have served an important emotion regulatory function at an earlier point of development, especially in adverse circumstances (Cole, Michel, & Teti, 1994).

Focusing on specific negative emotions is thus an important new direction. There are two additional points that should be made about emotion specificity. First, the study of emotion regulation has concentrated on the down-regulation of negative emotions. But the up-regulation of negative emotions as well as the regulation (up or down) of positive emotions must also be built into our future work (Cole et al., 1994). Second, just as all emotions are not alike, all anger or sadness or joy is not alike. Adolescent expression of anger toward mother might concern us but in Spangler and Zimmermann's (2014) study we learn it was associated with secure infant attachment. This opens our minds to the fact that honest communication of frustration might be an indicator of a healthy adolescent–parent relationship rather than a risk factor. Clearly there are factors that determine when such expression of anger is and is not problematic. Additionally, all joy is not mutual and beneficial. Individuals who enjoy another's distress (*schadenfreude*) to others are regarded as callous and in this case positive emotion has a different meaning (Chaplin & Cole, 2005).

Three more directions for the study of emotion regulation across the lifespan

As with any set of published papers, the authors of these studies acknowledge the limitations of their methods. These limitations should also guide future research. Of the many challenges that confront developmental emotion regulation researchers, these articles bring three to mind. Briefly, these are the need to have a more sophisticated consideration of the role of gender, an acute need to incorporate the role of cultural context, and the continuing need to conceptualize and define emotion and emotion regulation, including the fact that they are processes that unfold over time.

Gender

The study of the development of emotion regulation cannot escape the fact that gender—the gender of a respondent and the gender of the individuals with whom a respondent is (or imagines) interacting—is a factor. But a limitation of much of the gender and emotional development research, which includes studies of emotion regulation, is that the methods of assessment are subject to gender stereotyping. There is a pervasive belief that females are more emotional than males and that certain emotions are more acceptable for one gender than the other. But as a recent meta-analysis revealed the evidence of gender differences in observed behavior rated by objective coders is not as robust as we would expect based on self-reports or descriptions of others (Chaplin & Aldao, 2012). They indicate that gender differences in emotion develop over time. In short, when we wish to examine gender differences directly it is best to use multiple methods and to include objective assessments as well as methods (questionnaires completed by parents, self-reports) that are more prone to cultural biases. This will allow us to study not only the development of gender differences in emotion but in emotion regulation.

Culture

It is noteworthy that most of the studies in this special section had a reasonable degree of diversity among their participants. Notably, the potential influence of cultural values on emotion regulation was not part of any of the study designs. Understandably, as we strive to design studies with samples that represent the increasingly multicultural composition of national populations, the study of cultural influences represents a formidable challenge. It is not easy to study cultural differences but perhaps we should begin to pay more attention to this and not just by comparing individuals from different nations (Cole & Tan, in press). The development and implications of a specific way of regulating emotion may depend in large part on cultural values and contexts. Consider for example the implications of cognitive reappraisal, which is often regarded as an adaptive adult regulation strategy, when a minority group member is confronted with discrimination or other forms of oppression; it is not associated with better psychological functioning when a person is a minority group member (Soto et al., 2012). There is too little work that examines cultural differences in emotion regulation from a developmental perspective.

Defining and refining conceptualizations of emotion and its regulation

It is also noteworthy that although this set of studies acknowledged the definitional issues associated with the study of emotion regulation few actually defined the construct. In the child development literature, Thompson's (1994) definition is most often used. But despite that, few studies of the development of emotion regulation have attempted to approach the subject with the dynamic view he offered, describing how temporal and intensive features of emotion reflect regulatory processes. Both the functional perspective (e.g., Saarni et al., 2008) and the emerging evidence from the field of affective neuroscience (Dennis, 2010) indicate that emotion and its regulation is best regarded as an unfolding process rather than as discrete events. Although historical tradition leads us to label emotions as discrete objects, increasingly it becomes apparent that emotions are processes. Thus, Thompson (1994) was prescient in emphasizing a dynamic perspective on emotion.

Several research programs in this special section have the opportunity to capitalize on this dynamic perspective. Methods such as second by second coding of observational data (emotion expressions and regulatory behaviors; e.g., Spangler and Zimmermann, 2014) or experience sampling methods (English & Carstensen, 2014) provide rich data for examining process. Although the modal approach to time series data has been to average or sum information, an important future direction is the dynamic modeling of emotion regulation processes over time, for which there have been interesting advances (e.g., Bylsma & Rottenberg, 2011; Chow, Haltigan, & Messinger, 2010; Kuppens, Oravecz, & Tuerlinckx, 2010).

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