5

THE DEVELOPMENT OF ITERATIVE REPROCESSING

Implications for Affect and Its Regulation

William A. Cunningham
Ohio State University

Philip David Zelazo
University of Minnesota

INTRODUCTION

What is an emotion? How does emotion relate to cognition? How do we control our emotions? These questions have been debated vigorously at least since Socrates, and they have been central to psychology for over a century, but recent work in developmental social cognitive neuroscience provides a new framework for addressing them. In this chapter, we explore the development of emotion and its regulation in the context of our recent iterative reprocessing model (Cunningham & Zelazo, 2007; Zelazo & Cunningham, 2007). According to this model, emotion corresponds to an aspect of cognition—its evaluative, motivational aspect. This aspect of human information processing manifests itself in multiple dimensions—subjective experience, observable behavior, and physiological activity, among them. Although it is possible to have cognition that is more or less emotional, and more or less motivated, all cognition is motivated to some degree, and all emotional experience has a cognitive dimension. From this perspective, emotional experience
is modulated in important ways by processes that have been studied under the rubric of "executive function," and research on the development of executive function has clear implications for the development of affective processing.

Here, we begin with an overview of the iterative reprocessing model, with a focus on the ways in which affective processing operates in adults. We then describe the development of these processes in childhood, linking age-related changes in children's emotional experience to the development of the brain.

**THE ITERATIVE REPROCESSING MODEL**

The iterative reprocessing (IR) model (Cunningham & Zelazo, 2007; Zelazo & Cunningham, 2007) examines emotion as a dynamic process that unfolds in time. Encountered or imagined stimuli (e.g., people, objects, or abstract concepts) elicit relatively rapid affective associations, but affective processing is normally modulated by an iterative cycle of reflective processes. With every iteration of this cycle, one's evaluation of a stimulus can be adjusted in light of an increasingly wide range of considerations. By a process of "reseeding," information resulting from higher-order reflective processes is fed back into lower-order processes, and the affective response is recalculated. This process allows for the attentional foregrounding of relevant (and backgrounding of irrelevant) attitude representations and contextual information in order to develop a more nuanced evaluation congruent with the current context, and/or current goals.

Because each iteration of the cycle allows for additional reflective processing, the IR Model implies a rough continuum from "automatic" affective responses, entailing few iterations and a limited set of cognitive operations, to more "reflective" affective responses, entailing more iterations and cognitive operations (see Cunningham & Johnson, 2007). The extent to which affect toward any particular stimulus is reprocessed (i.e., the number of iterations it receives) is likely to depend on a host of personal and situational factors, including differences in opportunity, cognitive ability, and developmental level. It is hypothesized, however, that an important determinant of the extent to which people engage in reprocessing is the dynamic tension between two competing motivational drives: (1) a drive to minimize the discrepancy between one's response and the hedonic environment (i.e., to minimize error), which tends to increase the likelihood of reflective processing; and (2) a drive to minimize processing demands, which tends to decrease the likelihood of reflective processing. The influence of these competing
motivations varies as a function of situational demands, current goals, and individual differences in processing style—all of which shift the balance between reliance on initial iterations (yielding a “gut” reaction) and further reprocessing (permitting the construction of reactions that are more complex).

Initial iterations generally involve processing in subcortical brain regions such as the amygdala and the ventral striatum (especially the nucleus accumbens) and give rise to rapid evaluations based on innate biases (e.g., LeDoux, 1996; Öhman & Mineka, 2001) and learning (e.g., Armony & Dolan, 2002; Davis, 1997; Phelps et al., 2001; Whalen, 1998). When a stimulus is encountered, information about the stimulus triggers an unreflective motivational tendency to approach or avoid the stimulus, producing a series of physiological responses and reflexive reactions that are mediated by the hypothalamus (among other regions). These relatively undifferentiated physiological responses prepare the body for immediate action—fighting or fleeing—while additional neural processes continue to disambiguate the motivational implications of the stimulus. Importantly, although subcortical structures support automatic affect, such processes may maintain an ongoing and important role in generating current affect even as additional reflective processes are incorporated in affective processing.

Following this initial response to a stimulus, the physiological response is registered in the somatosensory cortex (and the insular cortex in particular), allowing for the representation of information about the current bodily state. Given connections among the insula, amygdala, and orbitofrontal cortex, the represented bodily state can be integrated into subsequent iterations of evaluative processing (Critchley, Wiens, Rotshtein, Öhman, & Dolan, 2004; Damasio, 1994, 1996; see also Rolls, 2000). During these subsequent iterations, more detailed information about the stimulus (from the sensory cortices) and the bodily state (from the insula) all provide input into the ongoing generation of the evaluation. These multiple inputs can serve to generate a more complex evaluation within a time period still typically labeled “automatic”—that is, several initial iterations may all occur within a few hundred milliseconds of stimulus perception (Oya, Kawasaki, Howard, & Adolphs, 2002).

After these initial iterations, however, amygdala projections to the orbitofrontal cortex allow for a comparison of expected rewards and punishments with current experience. This allows context to play a top-down, regulatory role in shaping affect (e.g., Blair, 2004; Beer, Heeroy, Keltner, Scabini, & Knight, 2003; Rolls, 2000; Rolls, Hornak, Wade,
McGrath, 1994). The orbitofrontal cortex receives input from multiple sensory modalities and may provide a common metric for representing and comparing disparate aspects of evaluative information (Montague & Berns, 2002; Rolls, 2000), including the evaluative connotations of self-generated mental representations (Cunningham, Johnsen, Mowrer, & Waggoner, 2008). Evidence suggests, however, that whereas posterior regions of medial orbitofrontal cortex may be relatively more involved in stimulus valuation, anterior regions of medial orbitofrontal cortex may be critical to the integration of these signals with goals, motivation, and the linking of affect to action (Cunningham, Kesek, & Mowrer, in press).

In many cases, affective responses to the situation mediated by the amygdala and orbitofrontal cortex will yield an evaluation sufficient to produce a behavioral response. In other cases, however, this joint processing will yield too much residual uncertainty or evidence of conflict (as when the stimulus is ambivalent), or fails to provide expected rewards. According to the IR model, the presence of conflict (e.g., the simultaneous activation of strong approach and strong avoidance reactions) triggers anterior cingulate cortex activation (see Bush, Luu, & Posner, 2000; Carter et al., 1998), which may then initiate additional reprocessing of the stimulus in regions of lateral prefrontal cortex involved in cognitive control (see Bunge & Zelazo, 2006; MacDonald, Cohen, Stenger, & Carter, 2000; Ridderinkhof, Ullsperger, Crone, & Nieuwenhuis, 2004). Additional reflection proceeds, as needed, through increasingly higher-order regions within a hierarchy of prefrontal cortex regions: from ventrolateral prefrontal cortex to dorsolateral prefrontal cortex to rostrolateral prefrontal cortex (e.g., Badre & D'Esposito, 2007; Botvinick, 2008; Bunge & Zelazo, 2006; Koechlin, Ody, & Kounelher, 2003; see Figure 5.1).

More lateral prefrontal cortex mediated processing allows regulation of affect in a top-down fashion by deliberately amplifying or suppressing attention to certain aspects of the stimulus, changing the input to the system on subsequent iterations. This iterative reprocessing will not necessarily generate an altogether new affective state, but will likely modulate its current evaluation by modulating activity in lower-order regions (e.g., Cunningham, Johnson et al., 2004; Ochsner, Bunge, Gross, & Gabrieli, 2002; Ochsner et al., 2004).

More complex networks of processing permit more complex construals of a stimulus, in part simply because more information about a stimulus can be integrated into the construal during each iteration, and in part because these networks support the formulation and use of higher-order rules for deliberately selecting certain aspects
of a stimulus or context to which to attend (Bunge & Zelazo, 2006). The selection function of prefrontal cortex is what foregrounds specific aspects of information (and backgrounds others), and it is these reweighted stimulus representations that are then used to reseed initial evaluative processing—for example, by influencing ongoing perception and processing of the stimulus. Prefrontal cortex may also play a
role in keeping current goals and contextual demands/constraints in mind, which is important for fulfilling the competing goals of minimizing error while minimizing processing load (e.g., Cunningham, Raye, & Johnson, 2005; Cunningham, Van Bavel, & Johnsen, 2008). This characterization of the prefrontal cortex is consistent with its hypothesized role in allowing for higher levels of reflective consciousness via reprocessing (Zelazo, 2004) and in the monitoring and control of cognition and behavior (e.g., Carver & Scheier, 2001; Shallice, 1982; Stuss & Benson, 1986). Taken together, the dynamic interactions among different brain regions identified in the IR model are argued to support a flexible and complex process of evaluation that unfolds in time and exists on a continuum from relatively automatic (and simple) to relatively reflective (and complex).

EMOTIONAL EXPERIENCE

The IR model also provides a framework for understanding how emotional experience is generated by computations of valence in a hierarchical cognitive system (Cunningham & Van Bavel, in press). Previous hedonic states represent how the organism was doing in the distant or immediate past. The current hedonic state represents an appraisal of how the organism is doing right now in the current situation—an idea that is conceptually similar to the idea of core affect (Russell, 2003). Predicted hedonic states represent how the organism is likely to do in the future, including how perceived changes in the environment are likely to change one’s hedonic state; this notion is again similar to that of anticipated affect (Russell, 2003). The delta function (the result of a comparator process) computes and represents whether things are getting (or have gotten) better or worse by comparing the current with previous and/or predicted hedonic states (cf. Frank & Claus, 2006).

These relatively simple states, together with more complex comparisons among states, offer an account for the basic emotions. For example, fear corresponds to a predicted negative state, whereas sadness follows when a comparison between the current hedonic state and a previous hedonic state results in a decrease in valence or perpetuation of a negative state. The experience of more complex emotions requires iterative reprocessing in order to construct appropriately complex representations of a situation. For example, the guilt that follows from a current hedonic state (e.g., of sadness) being less negative than predicted requires a higher order chain of comparisons.
THE DEVELOPMENT OF ITERATIVE REPROCESSING

The IR model was developed as an integration of a social cognitive neuroscience framework for thinking about attitudes and evaluation (Cunningham & Johnson, 2007) and a developmental cognitive neuroscience model of the development of prefrontally mediated reflective processing (Bunge & Zelazo, 2006; Zelazo, 2004). As such, the model is explicitly informed by a growing body of research on the development of prefrontal cortex in childhood (see Zelazo, Carlson, & Kesek, 2008, for review). The development of prefrontal cortex plays a well-established role in the development of executive function, but we argue here that the consequences of prefrontal cortex development extend beyond the range of behaviors normally studied under the rubric of executive function and include consequences for emotion regulation, and even the nature of affective experience (Zelazo & Cunningham, 2007).

THE DEVELOPMENT OF NEURAL SYSTEMS INVOLVING PREFRONTAL CORTEX

Although it continues to develop throughout childhood and adolescence (e.g., Giedd et al., 1999; Gogtay et al., 2004), prefrontal cortex function first emerges early—probably toward the end of the first year of life (e.g., Chugani & Phelps, 1986; Diamond & Goldman-Rakic, 1989). The growth of prefrontal cortex beyond infancy has been documented using a variety of measures, and a number of consistent patterns have been noted. For example, whereas myelination starts postnatally in prefrontal cortex, and then increases monotonically over the course of childhood (e.g., Klingberg, Vaidya, Gabrieli, Moseley, & Hedehus, 1999; Yakovlev & Lecours, 1967), gray matter volume in prefrontal cortex shows a pattern of early increases followed by gradual decreases—one that start in late childhood and continue into adulthood (e.g., Gogtay et al., 2004; Huttenlocher, 1990; O’Donnell, Noseworthy, Levine, & Dennis, 2005). These changes occur at different rates in different regions of prefrontal cortex (Giedd et al., 1999; O’Donnell et al., 2005).

In addition to these structural changes, there are general changes in the patterns of neural activation that occur during performance on measures of executive function, including an increasing reliance on more anterior regions of prefrontal cortex associated with age and executive function development (i.e., frontalization; Lamm, Zelazo, & Lewis, 2006; Rubia et al., 2000). For example, Lamm et al. (2006) used high-density (128-channel) electroencephalography (EEG) to measure event-related potentials (ERPs) on the scalp as children and adolescents
performed a go/no-go task, by collecting a number of behavioral measures of executive function. The N2 component of the ERP, an index of cognitive control, was source-localized to the cingulate cortex and to orbitofrontal cortex. However, the source of the N2 in older children and in children who performed better on the executive function tasks (regardless of age) was more anterior than that of younger children and children who performed poorly.

MECHANISMS UNDERLYING THE DEVELOPMENT OF EXECUTIVE FUNCTION: REFLECTION AND RULE USE

There is still considerable debate about how best to understand the development of prefrontally mediated EF in psychological terms, but there is growing support for the suggestion that the development of EF in childhood is due in part to age-related increases in the complexity of the representations that children are able to formulate, maintain in working memory, and use to control their behavior in a top-down, goal-directed fashion (Zelazo, Müller, Frye, & Marcovitch, 2003). These increases in complexity, in turn, have been explained by corresponding increases in the extent to which children can reflect on their representations (Zelazo, 2004).

On this account, each degree of reflection allows a stimulus to be considered in relation to a wider set of contextual considerations. For example, children may go beyond merely seeing a ball and appreciating its affordances to noting that it is called "a ball," to thinking about the relation between this ball and the ball they lost yesterday, etc. Such reflections increase the range of aspects of the situation to which they may respond, and it allows them to formulate more complex systems of verbally mediated if/then rules linking stimuli and responses. That is, reflection on rules formulated at one level of complexity is required to formulate higher-order rules that subsequently control the selection and application of these rules. Rather than taking rules for granted, and simply assessing whether their antecedent conditions are satisfied, reflection involves making those rules themselves an object of consideration and considering them in relation to other rules at the same level of complexity. The top-down selection of certain rules, all within a complex system of rules, then results in the goal-directed amplification and diminution of attention to potential influences on thought (inferences) and action when multiple possible influences are present. This, in turn, allows for greater cognitive flexibility in situations where behavior
might otherwise be determined by the bottom-up activation of rules that have been primed through previous experience.

Bunge (2004) and Bunge and Zelazo (2006) summarized evidence that different regions of prefrontal cortex are involved in representing rules at different levels of complexity—from simple stimulus-reward associations (orbitofrontal cortex), to sets of conditional rules (ventrolateral prefrontal cortex and dorsolateral prefrontal cortex), to explicit consideration of task sets (rostral prefrontal cortex). Figure 5.1 depicts the functional correspondence between regions of prefrontal cortex and rule systems at different levels of complexity (Bunge & Zelazo, 2006). On this account, as individuals engage in reflective reprocessing and formulate more complex rule systems, additional regions of prefrontal cortex are integrated into an increasingly elaborate hierarchical network of prefrontal activations. As Bunge and Zelazo (2006) noted, developmental research suggests that the order of acquisition of rule types shown in Figure 5.1 corresponds to the order in which corresponding regions of prefrontal cortex mature. With development, children construct neural systems involving the hierarchical coordination of more regions of prefrontal cortex—a hierarchical coordination that develops in a bottom-up fashion, with higher levels in the hierarchy operating on the products of lower levels through thalamocortical circuits.

In the service of EF, this hierarchical network is constructed in the same way that it is constructed in the service of reflective evaluation, described earlier. Information is first processed via circuits connecting the thalamus and orbitofrontal cortex. Orbitofrontal cortex generates learned approach-avoidance (stimulus–reward) rules. If these relatively unreflective processes do not provide an unimpeded response to the situation (i.e., if there is some degree of conflict), then anterior cingulate cortex—serving as a performance monitor (e.g., Ridderinkhof et al., 2004)—signals the need for further reflection, and the information is then reprocessed via circuits connecting the thalamus and ventrolateral. Further processing—as required, for example, when prepotent response tendencies elicited by bivalent rules need to be ignored—occurs via circuits connecting the thalamus to dorsolateral prefrontal cortex. Thalamocortical circuits involving rostral prefrontal cortex play a role in the explicit consideration of task sets or perspectives at each level in the hierarchy. The efficiency with which these circuits function develops markedly during childhood, but continues to change into adulthood, as shown by both behavioral measures of neural function (see Zelazo, Carlson, & Kesek, 2008, for review).
IMPLICATIONS FOR THE DEVELOPMENT OF EMOTION AND EMOTION REGULATION

Having reviewed our current conceptualization of affect and the development of executive function, we now outline the implications for the development of emotion and emotion regulation. Specifically, we examine how development can lead to increases in the types of emotions available, and how these emotions unfold in time.

Investigations of newborn emotional states (e.g., Wolff, 1987) suggest that babies are born with a relatively simple affective system allowing for a discrimination between positive current states and negative current states. These states can be conceptually linked to basic motivational systems where infants approach stimuli eliciting positive current states and avoid stimuli eliciting negative current states. Such stimuli include appetitive reinforcers and punishers, such as tastes (Lipsitt, 1986), but also information. P. R. Zelazo and colleagues (e.g., Weiss, Zelazo, & Swain, 1988), for example, used a head-turning procedure in newborn infants who were placed between two speakers and sounds were presented laterally, sometimes on the left and sometimes on the right. Following repeated presentation of a word ("titi") at a particular fundamental frequency, babies heard a version of this word that differed in fundamental frequency by one of five degrees of discrepancy (ranging from a change of 0–28%). Results indicated maximal orienting to the stimuli that were moderately discrepant in fundamental frequency (changes of 14% and 21%), as well as active avoidance of (turning away from) stimuli that did not change.

As infants explore their environments (aided by increases in motor control), they rapidly begin to learn to pair particular cues (potentially mediated through amygdala-striatal circuits) with expected changes in current affective state. The onset, at around 6 weeks of age, of social smiling to familiar caregivers is a good example. With encoding of stimulus-outcome relationships, and with the increased ability to represent predicted hedonic states, children begin to anticipate pleasure in the company of particular individuals. At the same time, however, these comparisons also give rise to the experience of fear and frustration. Lewis and colleagues (e.g., Alessandri, Lewis, & Sullivan, 1990; Lewis, Alessandri, & Sullivan, 1990) provided infants as young as 6 weeks with an opportunity to learn a simple operant response (pulling a string) associated with a consequence (a toy moving). During acquisition, infants displayed interest and enjoyment, but were less likely to do so in response to the consequence alone. Moreover, infants at this age showed evidence of frustration during extinction. In this context,
frustration likely reflects a degree of sensitivity to a failure to obtain a predicted hedonic state.

As prefrontal executive development continues, infants begin to be able to represent absent stimuli in working memory, and to imagine these stimuli changing over time. As a result, they can generate more explicit representations of predicted hedonic states, allowing for richer experiences of joy and sadness, as well as the emergence of anxiety. A good example of is the onset of stranger anxiety at around the end of the first year of life (Kagan, 1972, 1981)—a time of numerous behavioral changes that have been linked to rapid improvements in prefrontally mediated working memory (e.g., Baird et al., 2002; Liston & Kagan, 2002). The increases in reflection believed to underlie these changes (e.g., see Marcovitch & Zelazo, in press) allow for the anticipation of a possible increase in the negativity of one's hedonic state, corresponding to anxiety. Orbitofrontal cortex is believed to be critical for the integration of information about previous, predicted, and current hedonic states, and more complex emotions requiring this integration appear as the orbitofrontal cortex continues to develop (especially more in more anterior regions).

Lastly, as prefrontal cortex continues to develop, allowing for further self-reflection and the understanding of other minds, children's hedonic circuits will be more informed by social contexts and others' emotions, allowing an increase in the range of situations that elicit emotions such as empathy, guilt, shame, and pride. Lewis, Sullivan, Stanger, and Weiss (1989), for example, have documented the development during the third year of life of self-conscious emotions such as guilt and shame. Specifically, only after children demonstrate self-recognition in mirrors (arguably implying self-awareness of their bodies) do they display these more social emotions. Unlike more basic emotions, these emotions require a representation of self, other, and self relative to other—representations that require a theory of mind. Consistent with this idea, many preschool age children have difficulty discriminating between the subjective experience of emotion and the overt expression of an emotion (Harris, Donnelly, Guz, & Pitt-Watson, 1986).

Development of prefrontal cortex during the preschool years allows children to take into consideration contextual affective rules that facilitate effective, socially appropriate emotion regulation. A good example comes from Saarni's (1984) classic disappointment paradigm, in which children are given an undesirable gift. Carlson and Wang (2007) found improvements between 4 and 6 years of age in children's ability to hide their disappointment, and such individual differences in emotion regulation were related to individual differences in other indices of executive function. With further development, however, context (including the
imagined context of others’ minds) can play an increasingly large role in affective processing. Critically, from our point of view, the further development of prefrontal cortex does not simply provide new affective states per se, but rather allows for richer contexts that can be used to inform current emotional states and the affective subtleties of abstract experiences, aesthetic experiences, and complex mixed emotions such as schadenfreude.

One prediction that follows from this conceptualization is that as children develop, they should be more likely to engage in reflection during affective processing and emotion regulation. This should result in increasing reliance on more anterior regions of prefrontal cortex (i.e., frontalization; cf. Rubia et al., 2000), measurable by methods such as functional magnetic resonance imaging (fMRI) and electroencephalography. One EEG index of this prefrontally mediated processing is an event-related potential (ERP) called the lateralized late positive potential (LPP), which has been shown to be larger in amplitude following negative than positive stimuli in adults (Cunningham et al., 2005), but the IR model predicts that there will be a cascading sequence of neural markers as evaluation unfolds in time. Todd, Lewis, Meusel, and Zelazo (2008) investigated the time course of 4- to 6-year-old children’s ERP responses when these children were presented with pictures of their mothers’ and strangers’ happy and angry faces. ERPs were scored following face presentation and following a subsequent cue signaling a “go/no-go” response. Responses to face presentation showed early perceptual components that were larger following strangers’ faces, suggesting increased automatic processing of novel faces; a mid-latency frontocentral negativity that was greatest following angry mothers’ faces. All of this indicates an increased attentional monitoring or affect regulation evoked by an angry parent; and a right-lateralized late positive potential that was largest following angry faces, suggesting extended processing of negatively valenced social stimuli. Following the go/no-go response cue, a mid-latency negativity, commonly thought to measure effortful attention, was larger in “no-go” than “go” trials, and showed a right lateralized response that was greater to angry faces, possibly reflecting increased effortful control. All of this suggests that facial affect may elicit an interactive, hierarchically organized set of processes associated with social-emotional processing. Such processes include relatively implicit or automatic levels of stimulus evaluation and response as measured by the early components, as well as more elaborated, temporally enduring processes, as indexed by the LPP. Mid-latency components (such as the N2 component) may tap either cortical processes signaling recruitment of more distributed networks for more extended social-emotional
processing, or for the regulation of affective and behavioral. Overall, however, the findings from Todd et al. (2008) provide evidence that, by 4 to 6 years, networks for elaborative processing and regulation of important socio-affective information are subserved by overlapping but differentiated networks, some of which are right-lateralized, consistent with data on adult brains.

It is important to note that just because adults (and older children) have the ability to generate more complex evaluations, this does not mean that they always will. Specifically, as noted earlier, the degree to which more reflective processing and additional iterative processes will emerge is constrained by competing drives to minimize complexity and to reduce error. However, even with a desire to reduce error, situational constraints often limit one's ability to perform the necessary processing. Reflective processing (unlike automatic processing) requires time, attention, and resources. Thus, manipulations that reductions in the likelihood of reflective processing (e.g., imposing response deadlines that require quick responses) will result in affective responses that are more "childlike" and that are based on the most salient, superficial aspects of the situation. On this account, response deadlines will interrupt the cycles of reprocessing involved in reflection, resulting in evaluations based on less complex representations of a situation, associated, as well, with decreases in activation in anterior regions of lateral prefrontal cortex. Older children and adults should look like younger children when required to respond quickly, resulting in relatively immature reactions and relatively immature patterns of neural activation. Given that prefrontally mediated reprocessing is effortful, manipulations such as divided attention would also be predicted to result in decreases in reflective evaluation and decreases in activation in anterior regions of lateral prefrontal cortex. Interestingly, however, these manipulations should be less likely to influence more "basic emotions" (ones that are the result of more automatic hedonic processing; Cunningham & Van Bavel, in press) than more complex social emotions such as guilt and pride.

**CONCLUSION**

Although only in its infancy, the developmental social cognitive neuroscience approach to the study of affect and emotion seems well positioned to generate new understandings of fundamental processes involved in human subjective experience. Specifically, our IR model of evaluation and affect proposes a neurally plausible account of the computational processes of evaluation and affect. This model takes seriously
the nested hierarchies of representations that are used to understand the world, to make predictions about it, and to shape our behaviors. This integration of developmental cognitive neuroscience and social cognitive neuroscience provides critical predictions for adult and child emotional processing and regulation. Because these processes unfold in developmental time, the model makes explicit predictions about the developmental trajectory and nature of emotion during brain development. In addition, however, observation of the development of emotion should also yield a richer and more integrated model of affective experience in adulthood.

ACKNOWLEDGMENTS

We thank Michael Chandler and Andy Jahn for helpful comments on an earlier draft. Both authors contributed equally to this chapter.

REFERENCES


