time or place can, indeed, be damaging, which makes the development of capacities to effectively manage one's feelings undeniably important. What is missing, however, is a counterpoint view of emotions as constructive and compelling forces for good—i.e., as ultimate sources of purpose and meaning in life. Motivational psychologists have embraced the study of passion (Vallerand, 2014), but this domain is infrequently considered in emotion research. Thus, a final, ideal end in emotional development involves the possession of deep emotional investments; that is, having objectives in living to which one is passionately committed.

Robert Solomon's (1993) book, *The Passions,* is a brilliant formulation of this thesis. He begins by challenging long-held views, traceable to ancient Greeks, which construed human passions as unwanted, unexpected interruptions that degrade and demean us. He railed passionately against this characterization of passions as primitive ragamuffins, the refuse of psychic life that Western rationalism has long warned against with thinly veiled repulsion. Instead, Solomon proclaimed that passions are the very soul of our existence—they are the high court of consciousness, to which all else, even reason, must pay tribute. Passions thus are what commit and bind us to other people and to life causes that infuse our journeys with meaning and purpose. He drew on the Romantic era in music, literature, painting, and poetry to illuminate human passions. Some have belittled such works as the melodramatic histrionics of hopeless love affairs, but so doing misconstrues the greatest achievement of the Romantics; namely, their love of beauty, their reverence for the imagination, and their commitment to stirring up of the human spirit to give meaning and hope, particularly for dreary lives in an industrialized world that had become ever more dehumanizing. For Solomon, passions are quite simply the most important doings by which we create ourselves. As such, they completely resolve the core problem in the philosophy of the absurd—namely, those in full pursuit of their passions can never experience life as meaningless.

A further illustration of these ideas is Kay Redfield Jamison's (2004) book, *Exuberance.* She describes exuberance as an abounding, ebullient, effervescent emotion; it is kinetic and unrestrained; it spreads upward and outward, carrying ideas and actions. As a psychiatrist as well as someone who suffered from bipolar disorder, she was careful to distinguish exuberance from mania. Along with summarizing research into its neural substrates, her book beautifully illustrates exuberance with the lives of famous people. John Muir and Theodore Roosevelt were two individuals who used their passionate commitments (exuberance) about the environment to make dramatic and lasting contributions toward preserving the wilderness. Another individual, the lesser known Wilson Bentley, was a New England farmer who was captivated by the beauty of snow. His famous declaration was that no two snowflakes are alike, which he showcased with his photographic masterpiece, *Snow Crystals.* "Snowflake" Bentley's exuberance brought to millions an awareness of the loveliness that fell from the skies.

Although not frequently considered, it seems fruitful to entertain the idea that passionate commitments are fundamental to a well-lived life. Great achievements in life may not actually be possible without passions that reside at the core of one's soul. The ultimate developmental challenge is coming to know what one's passions are so that they can serve as guides for behaviors that give life meaning and purpose. This is where emotional development converges with another path; namely, the eudaimonic conception of well-being (Ryff, 2014), which blends feelings, goals, and actions in the pursuit of an excellence—effectively, a virtuous becoming of the best that one can be.

CODA

These musings are perhaps best seen as fugitive thoughts from someone outside mainstream emotion research. I chose to focus on guiding ideals in emotional development as a kind of provocation to reevaluate whether current science, with its emphasis on delimited aspects emotion regulation, is reaching high or deep enough to capture what really matters about optimal emotional experience across the life course. My philosophy is that we need thoughtful formulations of complex human capacities that wed our multifaceted emotions to our thoughts and motives and life situations, all in the service of helping us to become better individuals. Nurturing these ideals, in science and practice, may our best hope for building a better world.

14.8 AFTERWORD

What Develops in Emotional Development?

Regina C. Lapate and
Alexander J. Shackman

In contrast to the first edition of *The Nature of Emotion*, which mostly focused on infancy,

the contributors to the second edition considered the entire lifespan, including early childhood (Goldsmith, Cataldo & Nelson, and Shiner), adolescence (Shiner, Somerville & McLaughlin, and Crone & Pfeifer), adulthood (Shiner), and the transition from mid-life to older age (Hogan, Sims, & Carstensen, and Ryff).

CHILDHOOD

Within the first year of life, Cataldo and Nelson note that emotional-expression identification ability undergoes considerable development. For instance, the ability to discriminate between a happy and a fearful face emerges between five and seven months, as indexed by both behavioral and electrophysiological measures. This perceptual ability appears to be shaped by experience, as evidenced by several findings suggesting that children who have suffered early-life neglect display altered sensitivity for negative facial expressions (e.g., Pollak & Kistler, 2002). Cataldo and Nelson point out that a key challenge for the future is to understand *whether* and *how* the optimal development of this emotional-expression perceptual apparatus relates to the actual experience and expression of emotion.

Goldsmith and Shiner agree that the development of the self as well as of cognitive abilities during early childhood imbues core emotional states and traits with increasing complexity. The expression of the most "basic" or "primary" emotions—including joy, fear, anger, and sadness—comes on-line early in infancy, but continues to unfold over time. Shiner highlights work demonstrating that joy and fear emerge in the first year, with the expression of anger gradually increasing over the first several years, peaking around age three. Of course, children differ in their propensity to express each of these emotions, and Shiner tells us that individual differences in these emotional traits are moderately stable by the preschool years. By middle childhood, children's emotional range broadens to encompass sophisticated emotions—like shame, envy, and empathy—that may require a comparatively more advanced and mature representation of the self and an increasingly nuanced view of others.

Cognitive processes important for self-regulation, including attention and cognitive control, develop rapidly in early childhood. As a consequence, Goldsmith notes, the expression and experience of emotions become less tied to their immediate eliciting stimulus—and are instead increasingly regulated by context and goals (see also Question 7). Children gradually adopt "display rules" (Ekman, 1972; Safdar et al., 2009), and their reliance on behavioral strategies for emotion management and regulation (e.g., escape) decreases across middle childhood, giving rise to more sophisticated coping mechanisms, such as problem solving.

ADOLESCENCE

Crone and Pfeifer and Somerville and McLaughlin agree that adolescents are prone to more intense and labile feelings, relative to both younger and older individuals. In particular, peak emotional reactivity rises, and emotional experiences fluctuate more rapidly. Shiner highlights evidence that Agreeableness and Conscientiousness decline, whereas dispositional negative affect, or what she terms Neuroticism (see Question 3), peaks in adolescence, particularly among girls. Somerville and McLaughlin tell us that, as adolescents' social groups grow in complexity, interpersonal context exerts a particularly powerful influence on their emotional responses. In particular, socially meaningful stimuli (both positive and negative) *exacerbate* emotional reactivity, as indexed by hormonal, physiological, and subjective experience measures. Crone and Pfeifer adopt a broadly similar perspective, highlighting evidence that adolescence is marked by exaggerated reactivity in approach and reward circuits (e.g., ventral striatum) in response to social risk-taking tasks, particularly when performed in the presence of friends.

Several authors argue that adolescence is a period of complex changes not only in measures of emotional reactivity, but also in *emotion regulation*. Somerville and McLaughlin describe work showing that adolescents become progressively better at using cognitive reappraisal strategies to regulate negative affect in the laboratory (see also Question 7). But they also highlight important exceptions to this trend. For example, adolescents are selectively *worse* than older and younger individuals in voluntarily reappraising negative images if they depict social interactions or social suffering (e.g., Silvers et al., 2012). Somerville and McLaughlin also highlight evidence that adolescents differ in their motivation to regulate emotions in their daily lives. Adolescents seem to make less frequent use of adaptive regulatory strategies (e.g., cognitive reappraisal) relative to adults. And, compared to children, they show a greater propensity to ruminate about stressors. Somerville and McLaughlin hypothesize that these shifts in regulatory style may play an important

role in facilitating other age-appropriate developmental tasks, such as establishing autonomy from caregivers and forging intimate relationships with peers. As an example, they raise the possibility that co-rumination, common during this time of development, may have functional advantages, such as enhancing self-knowledge, strengthening social bonds, and deepening friendship quality. Therefore, an important challenge for future work will be to disentangle whether adolescents are *less capable* or simply *less motivated* to down-regulate negative affect, particularly in social contexts.

Crone and Pfeifer hypothesize that adolescents' heightened emotionality reflects the asynchronous development of neural circuits supporting emotional reactivity and emotion regulation, noting that, "On one hand, limbic regions, such as the ventral striatum and amygdala, frequently show elevated reactivity in adolescence. . . . On the other hand, brain regions that allow us to control our thoughts and actions, such as the prefrontal cortex, show a protracted developmental trajectory . . . reaching ceiling levels approximately between 14 and 20 years of age."

An exciting avenue for future research will be to clarify the relevance of this asynchronous neural development to emotional reactivity and regulation in the real world and in the clinic. Addressing this challenge and delineating specific aspects of neural development that increase vulnerability to psychopathology is particularly important because, as number of authors emphasize, several neuropsychiatric disorders have their roots in adolescence (Lee et al., 2014).

ADULTHOOD AND OLDER AGE

In an interesting contrast with the trajectory into adolescence summarized here, Hogan, Sims, and Carstensen note that older adults report greater *stability* of emotional experiences, higher quality of daily interactions, and more positive emotional experiences. They argue that these trends cannot be explained by cognitive decline, neurodegeneration, or even aging per se. Instead, these trends reflect changes in the management of emotion. In particular, Hogan, Sims, and Carstensen review evidence suggesting that older individuals are more adept at using proactive social strategies to manage and regulate emotional experience. Older adults generate more adaptive solutions to interpersonal conflicts (e.g., marital strife) than younger adults do. Furthermore, they report less distress while encountering everyday hassles or social conflicts, fewer negative interactions in general, and a greater tendency to avoid situations and individuals associated with potential conflict.

In the transition from adulthood into old age, Hogan, Sims, and Carstensen argue that *goals* and *perspectives* prominently change, as described by their Socioemotional Selectivity Theory (SST). Goals are set within a temporal context: when time is perceived as limited, as with older age or the onset of terminal disease, social selection occurs, and emotional goals shift to prioritize the most positive and meaningful experiences and partners. Consistent with this perspective, older individuals' emotional preferences and priorities resemble those of younger individuals when they are asked to imagine living much longer. Conversely, younger individuals' preferences were indistinguishable from older individuals' in the months following the September 11, 2001, terrorist attacks: both the young and the old placed greater emphasis on finding emotional meaning in their daily lives.

IDEAL EMOTIONAL DEVELOPMENT

Ryff draws on classical philosophy, the arts, and contemporary social science research while embracing the contribution of emotions and their development to well-being and optimal psychological functioning across the lifespan. In a shift of perspective from viewing emotions as something to be "controlled" to viewing them as goals in and of themselves enabling the living of a passionate life, Ryff focuses on ideal emotional functioning and highlights her *ideal ends* in emotional development. Those ideal ends include awareness of one's own emotions ("know thyself") as well as awareness of others' emotions ("where awareness turns outwards"); increased usage of *acceptance* as a coping mechanism; increased range of emotional experiences as well as their complexity ("the joining of profound positives and negatives"), combined with flexibility and context attunement. She beautifully illustrates this idea by describing *kintsukuroi*, the Japanese tradition of fixing broken pottery where "breakage is viewed as part of the history of the object" (rather than something to disguise). Finally, these ideal ends embrace emotions as "compelling and constructive forces for good," and the possession of "deep emotional investments." As Ryff reminds us, passions "are what commit and bind us to other people and to life causes that infuse our journeys with meaning and purpose."

SECOND EDITION

THE NATURE OF EMOTION

Fundamental Questions

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NOTES

INTRODUCTION

1. For example, the International Society of Research on Emotion (ISRE); Society for Affective Science (SAS); and Social & Affective Neuroscience Society (SANS).

2. *Cognition and Emotion; Cognitive, Affective, & Behavioral Neuroscience; Emotion; Emotion Review; IEEE Transactions on Affective Computing; Motivation and Emotion*; and *Social Cognitive and Affective Neuroscience*.

CHAPTER 1.1

1. All the transcriptions of James's words are drawn from Volume II of *The Principles of Psychology*, in the Dover Edition, 1950. Italicized passages are as published by James.

CHAPTER 1.5

1. Davidson, D., personal communication, April 16, 1978.

2. Personal communication, November 1, 2014.

CHAPTER 1.9

1. Ekman and Davidson made a similar point in the first edition of this volume: "Is there a sine qua non for emotion? The answer at this time must be No. The investigator must use multiple methods to study emotion, including, wherever possible, measures of behavior, subjective experience, and physiology" (p. 414).

CHAPTER 3.3

1. Anatomically, the amygdala is poised to assemble a broad spectrum of emotional reactions via projections to the brain regions that proximally mediate many of the behavioral (e.g., passive and active avoidance), peripheral physiological (e.g., cardiovascular and neuroendocrine activity), and cognitive (e.g., vigilance) features of momentary negative affect (Shackman et al., 2016; Fox & Shackman, in press).

2. Although these findings highlight the contributions of the amygdala to trait-like differences in threat reactivity, it is by no means the only relevant region. Mechanistic and imaging work highlights the important contributions of a distributed circuit encompassing the anterior hippocampus, anterior insula/orbitofrontal cortex, and periaqueductal gray (PAG) (Fox & Kalin, 2014; Fox, Oler, Shackman, et al., 2015; Fox, Oler, Tromp, Fudge, & Kalin, 2015; Fox et al., 2010; Fox, Shelton, Oakes, Davidson, & Kalin, 2008; Kalin, Shelton, & Davidson, 2007; Oler et al., 2010; Shackman et al., 2013). Like the amygdala, activity in each of these regions predicts trait-like individual differences in stressor reactivity.

3. Relations between temperament and resting-state brain activity are not limited to the amygdala—dispositionally negative monkeys, children, and adults also show greater resting-state activity in the electroencephalogram (EEG) over the right compared to the left prefrontal cortex (PFC) (Oler et al., 2016; Wacker, Chavanon, & Stemmler, 2010). Like the negative phenotype, individual differences in resting prefrontal EEG asymmetry emerge early in life and are relatively stable over time, reliable, heritable, and predictive of the intensity of emotional reactions to aversive stimuli (Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Smit, Posthuma, Boomsma, & De Geus, 2007; Towers & Allen, 2009; Wheeler, Davidson, & Tomarken, 1993). Like the dispositional-negativity phenotype, resting prefrontal EEG asymmetry: (a) prospectively predicts the first onset of mood disorders (Nusslock et al., 2011), (b) is exaggerated in patients with anxiety and mood disorders (Thibodeau, Jorgensen, & Kim, 2006; Nusslock et al., 2018), and is normalized by anxiolytic drugs (Oler et al., 2016). Furthermore, direct neurofeedback manipulations of prefrontal EEG attenuate negative affect elicited by subsequent exposure to aversive stimuli (Allen, Harmon-Jones, & Cavender, 2001). With the pharmacological evidence, this suggests that the neural mechanisms responsible for generating this electrophysiological marker causally

contribute to trait-like individual differences in threat reactivity. Recent efforts to pinpoint the source of the scalp-recorded EEG asymmetry have highlighted the importance of the dorsolateral prefrontal cortex (dlPFC; Shackman, McMenamin, Maxwell, Greischar, & Davidson, 2009), consistent with this region's well-established role in regulating momentary affect (Buhle et al., 2014).

4. Individual differences in BST activity may reflect altered communication with the orbitofrontal cortex (OFC). Large-scale imaging studies in monkeys (n = 592) demonstrate that threat-related metabolic activity in the OFC is heritable and predictive of trait-like differences in dispositional negativity (Fox, Oler, Shackman, et al., 2015). Moreover, selective OFC lesions are associated with decreased passive avoidance of uncertain threat and reduced BST activity in monkeys (Fox et al., 2010; Kalin et al., 2007), paralleling the consequences of naturally occurring OFC insults for BST activity in humans (Motzkin et al., 2015).

5. Deficient filtering of threat-related information from fronto-parietal working memory circuits, leading to elevated rumination over the past and increased worry about the future, may also contribute to context-independent negative affect (Stout, Shackman, Johnson, & Larson, 2014; Stout, Shackman, & Larson, 2013; Stout, Shackman, Pedersen, Miskovich, & Larson, 2017).

CHAPTER 5.3

1. Our friend and colleague, Dr. Jaak Pansepp (June 5, 1943–April 18, 2017), passed away just before this volume was published.

CHAPTER 5.9

1. This position is reminiscent of Lazarus' suggestion that "Emotion and cognition are each so complex and their mechanisms are spread so widely over the central and peripheral nervous system that, in my opinion, it is difficult to argue convincingly for separate systems as though there were a special brain organ for each" (Lazarus, 1991, p. 357).

CHAPTER 6.3

1. Note that in this essay I will not discuss the first portion of Wakefield's definition related to cultural factors. Those interested are referred to (Lutz & White, 1986; Markus & Kitayama, 1991)

CHAPTER 7.4

1. President George W. Bush, war, 2001 Remarks to State Department Employees. URL: http://www.sourcewatch.org/index.php?title=Evildoers.

2. http://www.businessinsider.com/ted-cruz-defunding-obamacare-nazi-germany-filibuster-2013-9.

3. Thanks to Ben Converse for this formalization.

CHAPTER 8.1

1. The terms "threat-related" or "threat-relevant" encompass a broad range of stimuli, including clear and immediate dangers (e.g., cues paired with shock), novel situations or individuals, uncertain or diffuse dangers (e.g., darkness), aversive stimuli (e.g., unpleasant images or films), and angry and fearful facial expressions. Angry faces signal a direct threat to the observer and prompt the mobilization of defensive responses, as indexed by potentiation of the startle reflex (Dunning et al., 2010; Hess, Sabourin, & Kleck, 2007; Springer et al., 2007), facilitation of avoidance-related movements (Marsh, Ambady, & Kleck, 2005), and increased fear ratings (Dimberg, 1988). In contrast, fearful faces signal the presence, but not the source of potential threat, and promote heightened vigilance in the absence of defensive mobilization. That is, static images of fearful faces do not amplify the startle reflex (Grillon & Charney, 2011; Springer et al., 2007) or autonomic measures (Dunsmoor, Mitroff, & LaBar, 2009). But they can increase subjective feelings of anxiety (Blairy, Herrera, & Hess, 1999) and are perceived as more threatening and arousing than neutral or happy faces (Grillon & Charney, 2011; Wieser & Keil, 2014).

CHAPTER 10.1

1. It is worth noting that Darwin (1872) stated that these opposing forms sometimes may not serve any function.

2. Calculated by using 20 facial action coding units, bilaterally where applicable, each of which may contract independently at five different levels of intensity.

3. An immediate physical utility distinguishes itself from the more distant social utility. Expression forms selected for social utility could also be considered "evolutionary" and functionally "egocentric." However, purely symbolic associated forms for social utility need not have any physical consequences.

CHAPTER 12.4

1. Surprise may also be considered to contain the fundamental property of unexpectedness that characterizes fear.

CHAPTER 12.5

1. Such as 2-alternative forced choice (2AFC) stimulus identification procedures: In 2AFC, the participant is asked to indicate a particular property of the stimulus in trials of "invisible" stimulus presentation (even if they claim they did not see the stimulus and thus are guessing)—for example, observers may report on whether a face was upright or upside down; or whether a facial expression was happy vs. fearful. This is in contrast with methods relying on subjective reports, such as when a participant is asked to

say "yes" or "no" to whether they saw a face. Different individuals have different response biases (e.g., different propensities to indicate that a stimulus is present given a particular sensory experience). Therefore, subjective measures may be confounded by response biases and are typically regarded as less conservative than 2AFC procedures (Wiens, 2006).

2. Note that the magnitude of amygdalar activation does not appear to be reliably modulated by conscious access to an emotional stimulus (Costafreda, Brammer, David, & Fu, 2008).

3. Replications cited include those of investigators adopting important procedural variations, such as alterations in the specific awareness manipulation method (including the original backward masking method, as well as interocular suppression and crowding), and the type of neutral target to be rated (originally a Chinese ideograph, and now, in several studies, a neutral face).

4. Note that awareness may not be required when cognitive control is not triggered implicitly but rather *explicitly* (Kunde et al., 2012), such as in the case of slowing down following a stop signal (van Gaal, Lamme, Fahrenfort, & Ridderinkhof, 2011), or switching a task set following a cue (Lau & Passingham, 2007).

5. Indeed, symptoms of degenerative disease to the LPFC are obvious if the patient has a job requiring mental flexibility and decision making, but not if s/he has a routinized job or lifestyle (Knight & D'Esposito, 2003).

CHAPTER 13.2

1. Here we use the term *emotion* as a catch-all. There are, of course, many affective states, which range from mood, to arousal, to true emotions. There is every reason to believe that all of these influence rationality and preferences in some way. We use the expression "emotion" in this brief essay as an exemplar for understanding how affective states in general influence decision-making.

2. Of course, if humans do become intransitive in some emotional states, then we need to be more creative in trying to understand the structure of their behavior. Under conditions in which a decision-maker is intransitive, a simple study of preferences will prove unsupportable mathematically. The economist David Laibson's famous dual-process beta-delta model (Laibson, 1997) is one example of a structural model for dealing meaningfully with intransitive behavior.

3. GARP stands for the "Generalized Axiom of Revealed Preference," developed by Hendrik Houthakker as a mathematical specification for what is probably the most common definition of full transitivity. For a more detailed explanation of this approach to transitivity, see Chapter 3, pp. 52–70, in Glimcher, 2010.

4. For simplicity, we completely neglect here the fact that apples and oranges, when bundled together in groups, may cause nonlinear utility interactions. This is a hugely important point taught to first-year economics students and called "substitution." In the references to which we point, this is developed in some detail. But in order to convey the most basic concepts, we neglect it here.

5. For an economist, this is an important distinction because significant differences in the shape of the preference function in the gain and loss domain can imply a specific form of intransitivity, an important point, which we again neglect for simplicity.

6. As pointed out first by Kahneman and Tversky (1979), people in some situations behave according to distorted rather than objectively given probabilities, which we can capture by replacing p in the *DEU* equation with a probability weighting function $w(p)$.

CHAPTER 15

1. Naturally, emotion researchers must remain mindful of measurement reliability in choosing between different within- vs. between-subjects designs (cf. Bradford, Starr, Shackman, & Curtin, 2015; Cannon, Cao, Mathalon, Gee, & NAPLS Consortium, 2018; Fox et al., 2012; Hedge, Powell, & Sumner, *in press;* Herting, Gautam, Chen, Mezher, & Vetter, *in press*).

2. From a clinical perspective, categorical approaches to diagnosing emotional disorders pose several critical barriers to discovering the nature and origins of psychopathology: rampant co-morbidity, low symptom specificity (e.g., insomnia), marked symptom heterogeneity, and poor reliability (Chmielewski, Clark, Bagby, & Watson, 2015; Clark, Cuthbert, Lewis-Fernandez, Narrow, & Reed, 2017; Fried, 2015, 2017; Fried & Nesse, 2015; Galatzer-Levy & Bryant, 2013; Goldstein-Piekarski, Williams, & Humphreys, 2016; Hasin et al., 2015; Kessler, Chiu, Demler, & Walters, 2005; Kotov et al., 2017; Krueger et al., *in press;* Olbert, Gala, & Tupler, 2014; Regier et al., 2013; Watson & Stasik, 2014). Addressing these problems requires a different kind of approach—one focused on narrower sets of transdiagnostic symptoms (e.g., anxiety, anhedonia)—as with the Hierarchical Taxonomy of Psychopathology (HiTOP) and Research Domain Criteria (RDoC) approaches (Clark et al., 2017; Kotov et al., 2017; Krueger et al., *in press;* Zald & Lahey, 2017). This 'symptoms-not-syndromes' dimensional approach (Fried, 2015) would also more naturally align with animal models (Fox & Kalin, 2014; Fox & Shackman, *in press;* Oler, Fox, Shackman, & Kalin, 2016). There is compelling evidence that traditional categorical approaches to diagnosing emotional disorders present several significant barriers to understanding the underlying mechanisms, including substantial

symptom heterogeneity, frequent co-morbidity, and low inter-rater reliability (i.e., uncertain 'ground truth') (Fried, 2017; Galatzer-Levy & Bryant, 2013; Hasin et al., 2015; Regier et al., 2013). The adoption of narrower dimensional phenotypes is likely to provide useful (Kotov et al., 2017; Krueger et al., in press).

3. *Aggression* can be split on functional and neurobiological grounds into systems involved in defensive, offensive (predatory), and conspecific aggression, with the latter including maternal aggression and resource competition (food, mates, and territory/shelter) (Adams, 2006; Berkowitz, 1993; Nelson & Trainor, 2007). Naturally, researchers must remain mindful of measurement reliability in choosing between different experimental designs (e.g., within- vs. between-subjects); e.g., Bradford, Starr, Shackman, & Curtin, 2015; Cannon et al., 2018; Hedge, Powell, & Sumner, in press; Herting et al., in press; Larson et al., 2000; Shackman et al., 2017).

4. See also https://www.nimh.nih.gov/research-priorities/rdoc/constructs/potential-threat-anxiety.shtml; https://www.nimh.nih.gov/research-priorities/rdoc/negative-valence-systems-workshop-proceedings.shtml.

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