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Emotional Extremes Inhibit Emotional Clarity

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Emotional Extremes Inhibit Emotional Clarity

by

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Thesis

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Arts

The University of Texas at Austin

May 2016

Abstract

Emotional Extremes Inhibit Emotional Clarity

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The University of Texas at Austin, 2016

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Emotions are embodied psychological experiences that have both physical and cognitive components. That is, emotional arousal is typically associated with some level of simultaneous physiological arousal, but in order for a discrete emotional experience to fully take shape, cognitive processes (attention, categorization, memories, expectations) must (1) interpret arousal in order to (2) label it with specific emotion words and emotional meaning (Barrett, 2014). The present research investigates and finds evidence for the hypothesis that the arousal endogenous to affective experiences disrupts the cognitive processes associated with constructing discrete emotions, much in the same way that arousal inhibits cognitive performance generally: curvilinearly (Yerkes-Dodson, 1908). Results indicate that emotional extremes (very weak and very strong emotions) are associated with low emotional clarity, whereas emotions experienced with a moderate amount of intensity are associated with high levels of emotional clarity. Furthermore, and as expected, the curvilinear relationship between emotional intensity and emotional clarity is mediated by physiological arousal.

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INTRODUCTION

Virtually all mental states have an affective component (Barrett, 2014). Even sitting alone in a room doing nothing is associated with some sense of pleasure versus displeasure (Wilson et al., 2014). Indeed, emotions pervade every corner of our lives, yet, for most people, formal training in identifying and labeling emotions usually stops after Kindergarten (Landy, 2009; Squires, 2012). This cessation occurs despite the fact that emotional experiences become increasingly complex across the lifespan (Consedine, 2011), and despite the fact that there are innumerable benefits associated with being able to clearly articulate emotions to one's self and to others: from increased self-awareness and better emotion regulation to more satisfying professional and personal relationships (Goleman, 1995).

While understanding emotional experiences provides benefits, emotion identification in adulthood is not always easy. For example, nearly 12% of the American population has been clinically diagnosed with alexithymia: a cognitive disorder characterized by severe deficits in identifying, describing, regulating, and expressing emotions (Sifneos, 1976; Taylor, Bagby & Parker, 1997). Furthermore, poor emotional understanding and communication are frequently cited as causes for interpersonal distress (Sanford, 2012; Goldman & Greenberg, 2006). And while an abundance of research has focused on how individual differences (e.g., emotional intelligence) are related to emotional understanding, there is a relative dearth of research investigating what features of an emotional experience *itself* might inhibit versus enhance emotional clarity. For example: What role does the body play in emotion perception? What role does the mind play? And if emotions manifest at both the physiological and psychological level, at what level does one's ability to identify and label emotions break down?

Emotions may feel rooted in our bodies, but they are ultimately brought into focus with our minds; that is: emotions are physiologically arousing, but they are shaped and refined via cognitive processes. Because our felt experience of emotions typically involves the synthesis of physical sensations (e.g., a pounding heart) with conceptual knowledge (e.g., environmental cues and personal expectations), the extent to which physical arousal that is endogenous to the emotional experience promotes (or at least does not disrupt) the cognitive processes needed to construct discrete emotional sensations should be related to how clear those emotions ultimately feel. In fact, previous research on the link between arousal and cognitive processing dictates very specific hypotheses concerning when emotional arousal will impede emotional clarity. Specifically, the well-documented curvilinear relationship between arousal and performance (including cognitive performance) suggests that extremely weak and extremely strong emotions are likely to be associated with extremes in physiological arousal which will impede cognitive emotion construction processes and thus produce deficits in emotional clarity; whereas moderately arousing emotions should be associated with unimpeded emotion construction processes and therefore optimal levels of emotional clarity. Thus, the present research investigates how the embodied nature of emotional experiences influences the cognitive processes involved in emotion construction, and makes predictions about when emotions will emerge in a clear and crystalized versus nebulous and undifferentiated form.

EMOTIONS ARE EMBODIED

By in large, emotional experiences are associated with concomitant physiological experiences. Even lay conceptions of affect link emotions to the body: People experiencing a new romance reference butterflies in their stomach, anxiety is believed to materialize as sweat on our palms, embarrassment as a red hue on our cheeks, and across a range of languages, social pain is described with physical pain words (Eisenberger & Lieberman, 2005). Indeed, there seems to be notable agreement in which parts of the body different emotions "reside". For example, across five studies where over 700 participants were asked to color the bodily regions they felt activated or deactivated when experiencing a range of emotional states, different emotions were consistently associated with statistically separable bodily locations (Nummenmaa, Glerean, Hari & Hietanen, 2014).

Decades of research have also demonstrated that beyond people's mental representations of emotions in the body, affective changes are associated with actual changes in peripheral physiology. In perhaps the most comprehensive review of its kind, Kreibig (2010) provides an exhaustive list of the ways in which emotional experiences and the autonomic nervous system reciprocally influence one another. Emotions such as anger, anxiety and stress are associated with increases in heart rate, systolic and diastolic blood pressure, cardiac output, and total peripheral resistance. Disgust is associated with increased heart rate variability, total peripheral resistance, and sympathetic-parasympathetic coactivation. Fear is associated with broad sympathetic activation as indexed by myocardial contractility, vasoconstriction, and an increase in electrodermal activation. Sadness is associated with increased cardiovascular sympathetic control and withdrawal, changes in respiration, and decreased blood pressure. Contentment is associated with decreased cardiovascular, respiratory, and electrodermal activity; pleasure has a similar physiological profile but also a tendency to be associated with greater vagal withdrawal; and happiness is associated with vasodilation, increased cardiac activity, electrodermal activity, and respiratory activity. It should be noted that while Kreibig's (2010) review identifies the typical pattern of peripheral activation associated with different discrete emotional states, that these patterns often vary across experimental contexts, across different tasks, and as a function of individual differences (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000). The key, however, is that hundreds of studies indicate that emotions are linked to changes in peripheral physiology, regardless of the exact pattern of activation documented from one study to the next.

Emotional changes are also associated with changes in neuronal activity (Christen & Grandjean, 2013). On one hand, these associations are evident at the broad, undifferentiated level of neural networks—for example, the interoceptive neural network (comprised of the somatosensory and somatomotor cortices, the insular cortex, cingulate cortex, and prefrontal cortices; Herbert & Pollatos, 2012) plays a critical role in monitoring internal emotional states (Critchley et al., 2004) as well as emotion processing and reactivity (Phan, Wager, Taylor, & Liberzon, 2002). On the other hand, the association between emotion and neuronal activity has also been documented at the discrete, highly differentiated level. To name a few of many examples: neuroimaging studies have demonstrated that the left pre-frontal cortex is critically, and even causally, related to the experience of approach oriented anger (Carver, C.S., & Harmon-Jones, E., 2009), that the amygdala is consistently implicated in the development and expression of fear (Davis, 1992), and that early-stage romantic love is associated with activation in the right ventral tegmental area, the right posterodorsal nucleus, and the medial caudate nucleus (Aron et al., 2005). Additionally, emotions are associated with hormonal and neurotransmitter activity (e.g., opioids, dopamine, oxytocin, cortisol; Cacioppo, Tassinary & Berntson, 2007). Thus, whether localized in the brain, or exerting influences on the rest of the body via neuroendocrine pathways, emotional experiences have a strong neuroanatomical component.

Somatosensory feedback also plays a critical role in our conscious experience of emotions. That is, afferent signals from the body shape emotional experiences. For example, alleviation of physical pain also reduces social pain (DeWall et al, 2010), and experimentally manipulated breathing patterns induce concordant emotional experiences (e.g., rapid deep breaths lead to the experience of fear; Philippot, Chapelle and Blairy, 2002). Even the position of our bodies in space exerts an influence on our emotional states. For example, slumped posture can lead to greater feelings of helplessness (Riskind & Gotay, 1982), participants who were insulted in an upright rather than a reclined position exhibited more activation in brain regions related to anger (Harmon-Jones & Peterson, 2009), and participants who held a pencil between their teeth in a manner that facilitated rather than inhibited the muscle movements associated with a smile reported experiencing more positive emotions, including pleasantness and humor (Strack, Martin & Stepper, 1988; Niedenthal, Brauer, Halberstadt & Innes-Ker, 2001).

But the embodied nature of emotions is perhaps never so obvious as when the mind-body connection is disrupted and, as a consequence, emotional experiences are rendered less clear. For example, alexithymiacs exhibit less accuracy in detecting their own heartbeats, or changes in their body temperature, which some research has demonstrated is directly related to their subsequent and severe difficulties in identifying acute emotional states (Herbert, Pollatos, Flor, Enck & Schandry, 2010b; Herbert & Pollatos, 2012). Additionally, a weakend mind-body connection in older age may in turn diminish emotional acuity (Khalsa, Rudrauf & Tranel, 2009; Mendes, 2010). For example, older (compared to younger) adults who exhibited blunted physiological arousal and a diminished ability to perceive stressed bodily states, did not seem to experience the anxiety associated with having to draw from risky (as opposed to safe) decks of cards (Denburg, Tranel & Bechara, 2005). Additionally, older adults (compared to their young counterparts) had significantly lower heart rate responses to inductions of negatively valenced emotions, such as fear and anger, as well as subsequently lower self-reported levels of these emotions (Levenson, Carstensen, Friesen & Ekman, 1991; Levenson, Ekman, Heider & Friesen, 1992). As mind-body connections are weakened, emotional experiences themselves may feel less salient.

Yet despite the embodied nature of emotions, there is little support for the idea that the richness and diversity with which emotions are experienced is rooted solely in bottom-up perceptions of somatavisceral sensations (for a meta-analytic review, see Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000; Barrett, 2014). Indeed, while physiological perceptions are central to the experience of emotion, they are just one of many ingredients from which emotional experiences emerge.

EMOTIONS ARE CONSTRUCTED

While emotions are embodied, the mind does not rely exclusively on peripheral or neurological sensorimotor processes to generate emotional experiences. For example, a recent series of studies investigating the impact of neurological lesions on emotion perception demonstrated that the anterior insula (once thought of as “a unique neural substrate that instantiates all subjective feelings from the body and feelings of emotion”; Craig, 2009) could be partially (or in one case completely) destroyed, yet affected individuals were still capable of experiencing a wide range of emotional states (Feinstein, 2013). In another example, a control group of participants taking placebos and an experimental group taking beta-blockers (a class of drugs that impedes rapid increases in blood pressure, which itself is a physical symptom that frequently precedes feelings of anxiety), reported statistically identical levels of anxiousness prior to a public speaking task (Hayes & Schulz, 1987). These findings point to the distributed, rather than encapsulated, nature of emotions in the brain and body, and suggest that emotional states cannot be reduced to their concomitant bodily processes.

Rather, discrete emotions are most likely to emerge when physical sensations are coupled with conceptual knowledge (such as past experience, personal expectations, cultural norms, external information and semantic knowledge), and this coupling is downstream of a variety of psychologically primitive processes that are both cognitive (categorization, attention) and embodied (affect, visceral sensations) in nature (Barrett, 2014). Indeed, without conceptual knowledge, mental representations of distinct emotions are not likely to form. For example, patients suffering from semantic dementia—which causes severe impairments of concept knowledge, including language and words—were able to spontaneously recognize affect cues on photographs of faces (such as pleasure versus displeasure), but could not recognize individual discrete emotion faces (such as fear, sadness, disgust; Lindquist, Gendron, Barrett & Dickerson, 2014). Additionally, the ability of children to differentiate similar but distinct emotion faces (such as a sad pout from an angry scowl) is linearly related to their ability to access emotion concept knowledge (Widen & Russell, 2010). This linear relationship is evident even when children have direct experience with the emotions in questions (e.g., they generate pouts and scowls themselves), suggesting that access to the cognitive concepts rather than familiarity with the emotions they are being tested on is responsible for the effect. Consistent with this finding, research has also shown that when cognitive emotion concepts are underdeveloped or made unavailable—via semantic satiation or semantic distraction—the speed and accuracy with which people differentiate between discrete emotions is impaired (Lindquist et al., 2006; Roberson & Davidoff, 2000). That is, top-down conceptual knowledge about emotions automatically shapes emotion perception.

But cognitions can also shape emotional experiences via effortful and intentional conceptual knowledge as well. In particular, the *challenge versus threat model of stress appraisal* (Blascovich & Tomaka, 1996; Tomaka, Blascovich, Kibler & Ernst, 1997) has demonstrated that interpreting non-specific autonomic physiological arousal as the body preparing itself for a challenge to be overcome (rather than as a threat to succumb to) also changes the emotional experiences participants associate with the arousal. In general, challenge or threat orientations toward stress are considered motivated cognitions that have downstream effects on affect and behavior. For example, participants who were led to believe that the physiological arousal they experienced before a GRE practice test was their body mobilizing resources to meet the demands of the task (versus controls who were given no information about the meaning of the physical arousal) experienced greater increases in salivary alpha amylase than controls, but also reported less anxiety, greater confidence, and exhibited better performance (Jamieson, Mendes, Blackstock & Schmader, 2010). That is, participants who were given information that provided a transparent, conceptual frame for their physiological arousal experienced more of it, but also appraised it in a more positive light. This general effect has been demonstrated across several studies: cognitive appraisals of arousal that are consistent with a *challenge* orientation can actually constrain the extent to which physiological arousal is construed as negative (for a review, see Jamieson, Mendes & Nock, 2013). Importantly, these effects are considered top-down (cognitions influencing physiological and affective states) rather than bottom up (see Tomaka, Blascovich, Kibler & Ernst, 1997, Studies 2 and 3,), and are examples of how motivated cognitive processes shape emotional experiences.

A recent and exciting line of neuroanatomical theory and findings suggest that cognitive influences on emotional perception may even take place at the neuronal level (Barrett & Simmons, 2015; Clark, 2013). Specifically, networks in the brain that are traditionally thought of as centers of emotional experience may be more architecturally capable of generating top down predictions about what an emotion should or will feel like, rather than passively accepting bottom-up somatosensory information from the periphery about real-time physiological states. Consider that limbic tissue (which is routinely implicated in the experience of emotion) is overwhelmingly agranular in its composition, meaning that is far more efficient at distributing information to (rather than receiving input from) other parts of the brain. This suggests that limbic tissue generates, rather than simply detects, embodied emotional experiences (Barrett & Simmons, 2015).

For example, imagine the brain tells the body to peer around a dark corner. Limbic tissue will send information about what the brain should expect to feel (based on simulations of past experience) via prediction neurons located in cortical layers 5 and 6 that terminate in layers 2 and 3 of granular and dysgranular cortical tissue (Barbas & Rempel-Clower, 1997). That is, limbic tissue can generate a prediction that peering around dark corners causes anxiety and fear, and this information is relayed to granular and dysgranular tissues. Granular and dysgranular tissue (in regions such as the mid- and posterior-insula, which are primary interoceptive regions) are well equipped to amplify and redistribute signals from limbic tissue about what the body *should* feel (anxiety induces heart rate increases), but these tissues are also receiving actual somatosensory information projected upward from the body's periphery and the thalamus in their cortical layer 4 (that is, information about the body's *actual* heart rate as it peers around the dark corner). Granular and dysgranular tissue then compares the limbic predictions to actual thalamic input in order to generate a prediction error, and this prediction error is used to modify future predictions about what embodied emotional experience should or should not feel like in a given scenario (Bastos, et al., 2012). For example, if it turns out that heart rate did not in fact increase when peering around the dark corner to the extent that the limbic predictions prescribed, prediction error sent back to agranular limbic tissue will revise the predictive output for future scenarios. The key here is that far from being the passive recipient of bodily signals, the brain plays an active role in constructing not just emotional experiences, but also in constructing the physiological sensations that accompany emotions. These predictions are accomplished largely through agranular limbic tissue that is distributed throughout a number of neuronal regions, including areas that are associated with complex cognition such as the pre-frontal cortex. Taken together, a predictive coding framework suggests that top-down effects of cognition are central to constructing embodied emotional experiences. (Barrett & Simmons, 2015; Clark, 2013).

Fundamentally, it is the interaction of bottom-up and top-down influences that bring emotional experiences into focus. The arousal that accompanies an affective experience is interpreted through a cognitive lens made up of conceptual knowledge (e.g., language categories, motivated appraisals, external stimuli), which promotes the emergence of some discrete emotional experiences and inhibits the emergence of others. But bottom-up and top-down influences don't always work in perfect harmony, and as a result, some emotional experiences may be construed as clearer and easier to understand than others. Physiological arousal, specifically, has direct influences not just on affective experiences, but also on cognitive processing – introducing the possibility that the level of arousal accompanying an affective experience may influence one's ability to engage in the cognitive processes needed for discrete emotion construction.

THE INFLUENCE OF AROUSAL ON EMOTION CONSTRUCTION

Over the past 100 years, evidence has been sufficiently mounted to suggest that physiological arousal is related to various types of performance. Of particular interest to the present paper is research documenting that arousal is related to cognitive performance in much the same way that it is related to physical performance: curvilinearly. In fact, even the seminal Yerkes-Dodson (1908) study—which is often reduced in social psychology classrooms to the explanation for why a moderate level of arousal helps basketball players make a shot–actually documented its most robust curvilinear effect between physical arousal and complex *cognitive* tasks (i.e., measures of working memory, decision making and multi-tasking while mice went through a maze).

In the past several decades, the curvilinear effect of physiological arousal on cognitive performance has been replicated with other animals (for cats see Dodson, 1917; for rats see Broadhurst,1959) including humans (Bregman & McAllister, 1982). For example, performance on a difficult verbal task improved as arousal increased from baseline levels (via pre-determined doses of caffeine), peaked at levels of moderate of arousal, and then declined as arousal levels continued to increase (Anderson, 1994). Researchers have also demonstrated that perceptions of, rather than actual, physiological arousal (i.e., perceived vigor throughout the day) are curvilinearly related to performance on reading comprehension tasks (Dickman, 2002). Even studies that have reported a linear relationship between arousal and performance highlight issues of restricted range, wherein their paradigms may have only tapped into one end of the arousal spectrum (low to moderate or moderate to high), and therefore potentially failed to capture underlying quadratic effects (Khan, Brinkman & Hierons, 2011).

Replications of the Yerkes-Dodson effect have also been demonstrated at the neuroanatomical level, including the influence of hormonal arousal on memory storage and retrieval (Introini-Collison et al., 1994), functional MRI analysis of physical arousal and working memory constraints (Callicott et al., 1999), receptor ligand stimulation and spatial memory (Conrad et al., 1999), and receptor excitation (arousal) and synaptic plasticity responses (Diamond et al., 1992). Of special interest is a collection of studies from a team of gerontology neuroscientists that offers intriguing hints at *why* physiological arousal may be curvilinearly related to cognitive processing. In the past five years, Mattson and colleagues (2011, 2015) have accumulated evidence that the stimulation of glutamate receptors (which can be readily accomplished by exercise or other physical activity) is non-linearly related to cognitive processing. Specifically, not enough or too much stimulation of glutamate receptors can actually damage or destroy neurons. Whereas more moderate activation of glutamate receptors can establish a chemical pathway between adjacent neurons that play a crucial role in categorization, learning and memory (Mattson, 2015). Thus, physiological extremes (low and high arousal) may inhibit cognitive processing quite directly via damage they cause to glutamate receptors at the neuroanatomical level.

So how exactly might emotional arousal curvilinearly influence the cognitive processes involved in emotion construction, rendering emotional extremes less clear? If emotion construction involves sustaining attention to internal psychophysiological signals, semantic labeling, and differentiating between discrete emotional experiences (all of which are cognitive processes), then the low and high levels of physiological arousal that accompany weak and strong affective experiences should be associated with less successful emotion construction, and hence, lower levels of emotional clarity. While the present study will not address precise issues of mechanism beyond the arousal-clarity relationship, it is reasonable to posit that very weak emotions are accompanied by correspondingly weak physiological symptoms, which may be too faint to detect and sustain attention to, thus resulting in fewer cognitive resources being deployed for the sake of emotion labeling, differentiation, and construction. On the other hand, very strong emotions should be accompanied by correspondingly strong physiological arousal, which may have a disruptive influence on cognitive processes related to emotion construction. For example, resources that might otherwise be dedicated to complex cognition (such as semantic labeling) may instead be directed toward physiological down-regulation of over-activated autonomic and endocrine systems. In both of these cases, valence and arousal will likely be detected (as these are psychologically primitive processes that do not in and of themselves require complex cognition to identify; Barrett, 2014), but any sense of discrete emotions should remain vague and undifferentiated. Emotions experienced with a moderate amount of intensity, however, should be accompanied by enough physiological arousal that they are easily detected, but not so much as to inhibit the cognitive processes geared toward situating them within the framework of conceptual knowledge that allows for discrete emotion identification, labeling, interpretation and ultimately clarity.

OVERVIEW OF THE PRESENT STUDY

Given that (1) emotions are embodied such that emotional arousal is almost always associated with some concomitant physiological arousal, (2) physiological arousal is curvilinearly related to many different types of cognitive outcomes, and (3) emotional experiences are constructed via effortful cognitive processes, the present paper suggests that emotional arousal will in fact be curvilinearly related to how successfully emotional experiences are constructed – that is, emotional intensity should be curvilinearly related to emotional clarity. The present study further proposes that, because emotional intensity and physiological arousal are often linearly and reciprocally related to one another, the curvilinear relationship between emotional intensity and emotional clarity will be mediated by physiological arousal.

These hypotheses will be tested using data collected from participants who have recently experienced a major relationship transition. While recruitment of this sample was lengthy and challenging, investigating the present research hypotheses in this population provides several advantages. First, people going through major relationship events typically report experiencing a diverse range of emotions that vary considerably on both valence and arousal (Sprecher, Wenzel & Harvey, 2008); this provides some assurance that key analyses will not be limited by restriction of range issues. Second, the emotion induction task in the study (which is a guided reflection on the recent relationship transition participants experienced) is personally and affectively relevant to the study subjects; importantly, previous research has demonstrated that personally relevant emotion inductions (such as discussing a proud life event) produce more reliable and robust effects than third-person, passive, or non-personally relevant emotion inductions (such as imagining how a target character would feel, or viewing decontextualized images; Coan & Allen, 2007). Lastly, results obtained via this sample may maximize opportunities to generalize the findings to the broader population, as virtually all humans will experience several major relationship transitions throughout the course of their lives.

METHOD

The present data were drawn from a larger, longitudinal study examining the effects of major relationship transitions on a variety of psychological and physical outcomes. In the larger study, data were collected in 3 waves: Wave 1 consisted of a 30-minute online survey participants completed the day before their lab visit; Wave 2 consisted of a 90 minute in-lab session; Wave 3 consisted of a 10-minute online survey collected 6-months after the completion of the lab session. The present study uses data exclusively from Wave 2 (the in-lab session).

PARTICIPANTS

Participants were 324 individuals from the Austin area who responded to study advertisements posted on recruitment flyers, which were specifically soliciting people who had either recently fallen in love with a partner or recently gone through a break-up with a partner. The final sample consists 115 participants (78 females, 37 males) who had fallen in love within the past 6 months and 209 participants (145 females, 64 males) who had gone through a romantic breakup within the past 6 months.

All participants were healthy adults who did not smoke or regularly use tobacco products, were not pregnant or nursing, had not been diagnosed with anxiety or depression, had not been in any major accidents in the month prior to their participation, and who did not work between the hours of 11:00pm and 6:00am (i.e., a night shift).

Women ranged from 18 to 34 years of age (M = 22.05, SD = 6.05), and men ranged from 18 to 28 years of age (M = 20.32, SD = 4.77). The racial profile of the participants was 44% White, 33% Hispanic, 19% Asian, 2% African-American and 2% "other". Participants were compensated for their participation by being entered into a raffle wherein they were eligible to win one of twenty $50 amazon.com gift certificates.

PROCEDURES

A visual timeline of all procedures, including when relevant measures were assessed, can be found in Figure 1.

Pre-emotion induction procedures. Upon arrival to the laboratory, individuals were given general information about the study and assured of the confidentiality of their responses. Next they completed a health intake survey designed to obtain information about their general health, as well as their sleeping, eating and drinking behaviors in the past 24 hours. Following this health intake survey, participants engaged in five minutes of deep, guided breathing using a guided breathing application on an ipad. This was designed to help the participants get comfortable and relax; additionally, the guided breathing was meant to allow participants to achieve a physiological baseline (i.e., an autonomic resting state). Participants then spent approximately 15 minutes completing a packet of questionnaires assessing their positive and negative emotions, trait affect intensity, trait emotionality, mental and physical health, and their sense of time perspective. After completing the first packet of questionnaires, participants provided a saliva sample.

Emotion Induction: relationship transition reflection and control conditions. Next, experimenters verbally lead participants through another guided breathing exercise which lasted approximately 3 minutes. Immediately following this guided breathing exercise, participants were randomly assigned to either engage in a four minute guided reflection of their relationship transition (i.e., the experience of falling in love or breaking up), or to a control condition where they watched four minutes of a nature video (pre-tested to be minimally arousing and emotionally neutral).

Participants who had recently fallen in love and who were assigned to complete the partner reflection were prompted to think about what it was like when they realized that they were in love with their partner, to recall how it felt to tell their partner that they loved him or her and to fill their minds and bodies with all the emotions that being in love created. Participants who had recently gone through a break-up and who were assigned to complete the ex-partner reflection were prompted to imagine what it was like when they realized that their relationship was not going to last, to recall how it felt to have their relationship end and to fill their minds and bodies with all the emotions that going through the break-up created. Participants assigned to the control condition watched four minutes of the nature video Appalachian Trail instead of reflecting on their relationship transition.

Following the relationship transition reflection/nature video, participants talked out loud for 4 minutes and then wrote for 4 minutes about any and everything going through their minds. Immediately afterwards, participants answered questions assessing their positive and negative emotions, state emotional strength and emotional clarity, and their visceral physical sensations.

Post-reflection procedures. Afterwards, participants provided two more saliva samples, one right after the other. Next, participants completed a set of questionnaires that lasted approximately 15 minutes. This questionnaire contained measures of passionate love, conscientiousness, daily hassles, implicit relationship theories, self-concept clarity, interpersonal support, perceived daily stress, self-esteem, and life satisfaction. Upon completion of this questionnaire, participants completed a timed connect-the-dots task. Lastly, participants provided a final saliva sample and a set of demographic questions. Finally, participants were debriefed.

MEASURES

Participants completed all study measures via paper and pen surveys. Table 1 provides descriptive statistics, including correlation estimates for all observed study variables.

Affective and physiological measures. Each of the following measures was administered immediately *after* participants completed the partner reflection. Appendix A includes the exact measures as they were presented to participants. Participants responded to the item: "Overall, how would you describe the strength of your emotions right now?" on a 7-point scale where 1 = *very mild/very weak* and 7 = *very strong/very intense*. Participants also responded to the item: "Overall how clear are your emotions to you right now?" on a 7-point scale where 1 = *not at all clear*, 4 = *somewhat clear*, and 7 = *extremely clear*. Lastly, the arousal item from the Self-Assessment Manikin (SAM; Bradley & Lang, 1994) was used as an index of the extent to which participants felt internal physiological activation. This instrument uses pictures to represent a gradient of internal arousal on a 9-point scale where the low anchor (1) depicts an image of a person experiencing virtually no arousal and the high anchor (9) depicts a person experiencing an extreme amount of arousal.

COGNITIVE MEASURE. Participants completed a timed connect-the dots-task that involved connecting 287 dots together (see Appendix B). Experimenters instructed participants exactly when to start the task, and started a stopwatch at the exact moment participants began. Participants rang a bell as soon as they completed the task, and experimenters paused the stopwatch as soon as they heard the bell. The time it took participants to complete the connect-the-dots task was used as the measure of cognitive processing speed. The time was recorded in minutes and seconds (e.g., 4 minutes and 23 seconds), but was converted to only seconds (e.g., 263 s) for all analyses. Thus, the greater the score (the longer it took participants to complete the task), the poorer the performance.

LATENT VARIABLE. Because emotional clarity is a broad concept that can be indexed by a variety of measures, and may manifest in different forms across different situations (Boden, Thompson, Dizén, Berenbaum & Baker, 2013; Boden & Berenbaum, 2011), a latent construct called *global emotional clarity* was created as an attempt to fully capture the myriad ways emotional clarity may be experienced by participants. This latent construct was composed of five indicators: (1) the face-valid emotional clarity item described above, (2) an item measuring the extent to which participants' emotional experiences were granular and discrete ("I feel like my emotions are clear and distinct, rather than just one big blob"), (3) an item measuring the extent to which participants understood their internal states ("I feel like I understand what's going on inside of me right now"), (4) an item measuring the extent to which participants felt unable to identify their feelings ("I have feelings right now that I can't quite identify"), and (5) an item measuring the extent to which participants had difficulty verbally expressing their emotions during the 8 minutes they spent talking and writing immediately following the partner reflection/nature video ("It was difficult for me to find the right words to describe my feelings"). Indicators 2-3 were measured on a 7-point scale where 1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *neutral*, 5 = *somewhat agree*, 6 = *agree*, and 7 = strongly agree. Indicators 4 and 5 were measured on the same scale but reverse coded.

DATA ANALYTIC STRATEGY

STATISTICAL MODELS. A preliminary analysis was conducted to first determine whether a quadratic predictor of emotional intensity was significantly related to emotional clarity (Model 1). This was a necessary first step because it produces estimates of the extent to which the F-statistics, beta-parameters, significance levels and R^2 values *change* as a result of adding a quadratic predictor to a traditional linear model. Next, a path analysis was used to identify the magnitude, direction and significance of the relationships between the predictors (the linear and quadratic forms of emotional intensity), the mediators (the linear and quadratic forms of perceived physiological arousal), the outcome of emotional clarity (Model 2 – part 1) and, as a replication of the

Yerkes-Doson effect, a measure of cognitive performance (Model 2 – part 2). The benefit of conducting a path analysis rather than an ordinary least squares multiple regression analysis is that it produces a measure of residual variance (i.e., error) for each endogenous variable in the model (rather then a single aggregate error term). This is especially useful given that I tested whether both linear and quadratic terms mediate the effects of interest. Furthermore, path analyses allows for the simultaneous testing of direct and indirect effects (mediating effects); that is, Mplus takes into account the standard error of the direct a and b paths, as well as the covariance between the a and b paths to estimate the magnitude of the indirect effects (Bollen & Stine, 1990). Lastly, a structural equation model including a latent construct of emotional clarity tested the relations among all variables of interest (Model 3).

MODERATION BY REFLECTION TYPE. The following analyses included participants who were assigned randomly to reflect on their relationship transition (the experimental condition), as well as participants who were assigned randomly to reflect on the nature video (the control condition). Although the mean levels of emotional intensity may vary by group, I did not expect the reflection type (falling in love, breaking up, nature video) to moderate the primary effect of interest (the curvilinear relationship between emotional intensity and emotional clarity). However, to ensure that this effect was not unique to a particular type of reflection procedure, reflection type was included as a potential moderator in Models 2 and 3.

STATISTICAL POWER. The models tested in the present paper were kept relatively simple for both theoretical and statistical reasons. Mainly, when using maximum likelihood (ML) estimation, a general rule of thumb for sample size put forth by Kline (2011) is that an ideal sample size to parameters ratio (N:q) is, at the minimum, 20:1. The present data set includes 324 cases, yielding a sample size to parameter ratio of just over 21:1.

MISSING DATA. Analyses were conducted to determine if data were missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR). These analyses yielded the conclusion that there was no relationship between the 5 missing values (from 3 cases) and any other values in the data set (missing or observed), nor to the values on the outcome of interest. As such, the data were classified as missing completely at random (MCAR). Therefore, in Model 1 (conducted in SPSS), missing data were handled via the default of pairwise deletion, and for Models 2 - 4 (conducted in Mplus) the default procedure for handling missing data (full-information maximum likelihood; FIML) was used to estimate (rather than delete) the missing values.

RESULTS

MODEL 1: Is the relationship between emotional intensity and emotional clarity linear or curvilinear?

A hierarchical multiple regression was conducted in SPSS to determine the extent to which linear and quadratic measures of emotional intensity predict emotional clarity. In the first step of the model, emotional clarity was regressed onto the linear measure of emotional intensity. In the second step of the model, emotional clarity was regressed onto both the linear and quadratic measures of emotional intensity. Results indicate that the linear measure of emotional intensity was positively and marginally significantly related to emotional clarity and accounted for a moderate amount of variance in emotional clarity. However, the quadratic predictor of emotional intensity was also related to emotional clarity, and its addition to the model resulted in a statistically significant increase in R^2 from .04 to .28, $F_{change}(1, 348) = 57.90$, $p_{change} < .001$ (see Table 2). Although the parameter estimate for the quadratic measure of emotional intensity is not interpretable in terms of magnitude, the direction of the coefficient indicates that the line with the best fit to the data takes the shape of an inverted U. These results indicate that emotional clarity is highest for those who report moderately intense emotions, and lower for participants who report relatively weak or relatively strong emotions (see Figure 2).

MODEL 2 – PART 1: Does perceived physiological arousal mediate the relationship between emotional intensity and emotional clarity?

The first set of path analyses examined (1) the direct effects of both the linear and quadratic terms of emotional intensity on emotional clarity, (2) the direct effects of both the linear and quadratic terms of perceptions of physiological arousal on emotional clarity, (3) the direct effect of both the linear and quadratic terms of emotional intensity on the corresponding linear and quadratic effects of perceived physiological arousal, (4) the indirect effects of the linear and quadratic terms of emotional intensity on emotional clarity via perceptions of physiological arousal and (5) whether reflection type moderated any of these relationships. The proposed path analysis model was estimated using Mplus 3.12 (Muthen & Muthen, 2004).

Figure 3 presents standardized coefficients and significance levels for the model's direct effects. Overall, the model accounts for 23% of the variance in emotional clarity and the overall model fit was satisfactory, comparative fit index (CFI) = .94; root mean-square error of approximation (RMSEA) = .08.

PREDICTORS TO MEDIATORS. Both the linear and quadratic terms of emotional intensity were significantly and positively related to the linear and quadratic terms of perceived physiological arousal, such that as emotional intensity increased, perceived physiological arousal also increased. Although it may be unfamiliar to consider two quadratic variables being linearly related to one another, the proper interpretation of a significant and positive parameter estimate is that the covariation between these two variables is strong and tight, such that they track each other across the spectrum of response options (Hayes & Preacher, 2010).

MEDIATORS TO OUTCOME. As hypothesized, the quadratic term of perceived physiological arousal was significantly related to emotional clarity, such that high and low levels of perceived physiological arousal are associated with lower levels of emotional clarity, whereas moderate levels of perceived physiological arousal are associated with higher levels of emotional clarity. The linear predictor of physiological arousal was not significantly related to emotional clarity.

PREDICTORS TO OUTCOMES. Also consistent with hypotheses, the quadratic term of emotional intensity significantly predicted emotional clarity, such that relatively low or relatively high levels of emotional intensity were associated with lower levels of emotional clarity, whereas moderate levels of emotional intensity were associated with higher levels of emotional clarity. As expected, the linear term of emotional intensity was not significantly related to emotional clarity, which is unsurprising given our hypotheses, as well as the fact that the linear relationship between these two variables in Model 1 was only marginally significant.

INDIRECT EFFECTS. Three different indices of indirect effects are presented in Table 3. The default method of estimating indirect effects in Mplus is with delta method standard errors (Muthen & Muthen, 2004). However in order to test the indirect effects more conservatively, Sobel's asymptotic z-tests are also included. Lastly, confidence intervals of indirect effects were also obtained via bootstrapping (2000 iterations) in order to properly adjust for the potential influence of outliers in the sample.

No evidence for full mediation emerged for either of the indirect effects, as the direct effects remained significant even after accounting for the effects involving the mediators. However, as expected, there is evidence that the quadratic term of perceived physiological arousal partially and significantly mediated the relationship between the quadratic terms of emotional intensity and emotional clarity, suggesting that the curvilinear relationship between emotional intensity and emotional clarity is in part explain by the relationship between emotional intensity and perceived physiological arousal, which in turns impacts emotional clarity.

REFLECTION TYPE AS A MODERATOR. Reflection type did not significantly moderate any of the paths presented in the Model 2. This is unsurprising given that, although *mean* levels of emotional intensity, clarity, and granularity did differ by reflection type (see Table 1), the source of that emotional intensity (e.g., a nature video or a relationship event) should not differentially influence how much physiological arousal or emotional clarity is ultimately associated with the emotional intensity.

MODEL 2 – PART 2: Are perceptions of physiological arousal curvilinearly related to cognitive performance?

Path analyses in Model 2 also explored the direct paths between the quadratic term of emotional intensity (predictor), the quadratic term of perceived physiological arousal (mediator), and the outcome of cognitive performance (outcome), and well as the indirect path from quadratic emotional intensity to cognitive performance.

As presented in Figure 3, results indicate that perceive physiological arousal is indeed curvilinearly related to cognitive performance as indexed by the amount of time it took participants to complete the connect-the-dots task. This represents a replication of the classic Yerkes-Dodson effect and suggests that participants who reported low and high levels of perceived physiological arousal took longer to complete the connect-the-dots task (exhibited worse performance) than did participants who reported comparatively moderate levels of physiological arousal. Furthermore, and as an extension of the Yerkes-Dodson effect, there is evidence that emotional intensity is also curvilinearly related to cognitive performance, and that this relationship is significantly mediated by physiological arousal (see Table 3 for indirect effects). This finding is not surprising given that the model also demonstrates that emotional clarity and cognitive performance significantly co-vary with one another. Lastly, the overall model accounts for nearly 9% of the variance in how participants performed on the connect-the-dots task, which given the absence of traditional covariates such as IQ, gender, age, and education level, may be considered an impressively large percentage.

The primary reason potentially useful covariates were not included in the present model is because the inclusion of additional parameters would have dramatically reduced the power with which the significant effects of interest could be detected. The present Model 2 stayed within the recommended sample size to parameter ratio.

MODEL 3: Does including a latent construct of emotional clarity further improve model fit?

Because emotional clarity is likely a multi-dimensional construct (Boden et al., 2013) that cannot be perfectly measured with any one item, a latent factor called global emotional clarity was created to tap into the range of ways emotional clarity may emerge for participants. The only design components that differ between Model 3 and Model 2 is that emotional clarity is measured as a latent construct in Model 3.

Measurement model. Before conducting the full path analysis (i.e., the structural model), I tested the measurement model to ensure proper fit of the five latent indicators. A confirmatory factor analysis was run in Mplus to determine the strength with which each indicator loaded onto the latent factor of global emotional clarity. The measurement model exhibited a very good model fit (CFI = .98; RMSEA= .06), and the magnitude of all factor loadings exceeded .80 and were significant at the $p < .001$ level (standardized factor loadings are presented in Figure 4).

Structural model. The structural model tested the exact same direct and indirect paths as were tested in Model 2, and just as in Model 2, reflection type did not significantly moderate any of the paths presented in the Model 3. Standardized coefficients are presented in Figure 4, and a table of indirect paths is provided in Table 4. Of note is a descriptive improvement in model fit (CFI = .99; RMSEA= .03) compared to Model 2, providing a preliminary hint that conceptualizing emotional clarity as a latent construct may result in a better fit of the model to the data.

The magnitude and direction, as well as which paths were significant, mostly did not differ between Models 2 and 3. However, there were a few notable exceptions (which appear in bold in Figure 4): The magnitude of the direct path between the quadratic term of emotional intensity and global emotional clarity increased, as did the direct path between the quadratic term of perceived physiological arousal and global emotional clarity. Additionally, the covariance between global emotional clarity and cognitive performance also increased. Lastly, the total amount of variability accounted for by the model (R^2) in physiological arousal (quadratic), global emotional clarity and cognitive performance all increased by a minimum of five percentage points and a maximum of 13 percentage points. These results suggest that conceptualizing the construct of emotional clarity as a latent factor composed of a variety of indicators may provide a better model for understand the relationships between emotional clarity, perceptions of physiological arousal and emotional clarity.

Taking the direct and indirect effects together, there is evidence that perceived physiological arousal (quadratic) partially and significantly mediates the curvilinear relationship between emotional intensity and global emotional clarity.

DISCUSSION

Emotional experiences are composed of multiple inputs. The bodily inputs consist of automatic physiological processes and are consciously experienced as visceral physical sensations, whereas the cognitive inputs unfold as a cascade of information processing that synthesizes on-line physical sensations with conceptual knowledge, language categories, past experience, and motivated expectations (among other things) to ultimately construct our lived emotional experiences (Barrett, 2012; Barrett, 2013; Barrett, 2015; Lindquist, 2013). Importantly, the extent to which emotional experiences are refined and discrete depends on these cognitive processes. Without them, emotional experiences are likely to be reduced to their basic affective states (arousal and valence), rather than the rich, detailed experiences that constitute our most memorable emotional moments.

It is important to keep in mind that just because emotion construction happens quickly and sometimes imperceptibly does not mean that it is not cognitive in nature. Language production, counting, and depth perception are all learned cognitive processes that develop over time and, with experience, occur automatically and effortlessly. Likewise, emotion construction is more difficult upon one's initial exposure to various culturally mandated and socially reinforced emotion concepts, as well as to the patterns of body responding that are associated with different affective scenarios, but becomes more automatic and effortless over time. As Lisa Barrett (2014) writes: "The hypothesis is that over a few hundred milliseconds, knowledge from the past is reconstituted in a way that is tailored to the immediate sensory array, such that a situated conceptualization shapes initial sensory representations, perhaps changing them, as a meaningful, momentary gestalt of emotion emerges." In this vein, emotions can be thought of as something that we actively and automatically *do* rather than passively feel.

The present research demonstrates that the physiological arousal endogenous to an emotional experience curvilinearly inhibits emotional clarity—most likely through inhibiting the cognitive processes related to emotion construction. This suggests that developing emotional clarity may be akin to mastering a well-learned cognitive performance task, wherein performance is subject to error depending on a range of factors. This paper outlines one such factor: the arousal of an emotion. But additional factors might also inhibit emotional clarity, including other features of emotions such as the duration or valence of the emotion as well as individual differences such as emotional intelligence and interoceptive sensitivity.

Findings from this study also have implications for how clarity concerning an emotional experience might be improved, although the recommendations would be different depending on how intense poorly understood emotions are to begin with. Strong emotions might simply need time to cool down before they can best be understood. As such, it is possible that if participants in the current study had provided a second rating of emotional intensity and clarity an hour post-partner reflection, they would have reported less intensity and more clarity concerning their relationship transition. This is consistent with lay theories about needing temporal distance from an emotional experience before true understanding can emerge. On the other hand, poorly understood weak emotions might need to be "warmed up" so they can be fleshed out. Despite being low intensity, weak emotional experiences can accumulate over time and influence our thoughts and behaviors. For example, small doses of every-day gratitude have far reaching consequences for physical and mental health, as well as social and relational health (Algoe, Gable & Maisel, 2010), but only when effortfully reflected upon when being recorded in daily diaries. If low intensity emotional experiences consistently remain under our conscious radar, we may be missing opportunities to benefit from them (if they are positive), or confront them (if they are negative).

The present research represents both a conceptual replication and extension of the classic Yerkes-Dodson effect: the findings demonstrate that *affective* arousal is curvilinearly related to cognitive performance (emotional clarity), and that *perceptions* of, rather than actual, physiological arousal are also curvilinearly related to cognitive performance. Despite the usefulness of these findings, future research should examine whether actual physiological arousal curvilinearly mediates the relationship between emotional intensity and emotional clarity. Indeed, measures of actual physiological arousal (as indexed by salivary cortisol and DHEA) are in the process of being analyzed for the participants in the present study—and given that the arousal item of the SAM has consistently and reliably predicted cardiovascular arousal in previous research (Bradley & Lang, 1994), I expect that our measures of neuroendocrine arousal will also be associated with subjects' perceptions of physiological arousal.

Emotional understanding is not something that is automatic or guaranteed, and the present study demonstrates that the physiological and cognitive components of emotional experiences interact to influence our ability to clearly identify, label and articulate them.

That is, features of emotions *themselves* play a role in whether they are experienced as crisp and pronounced or dull and undifferentiated, and arousal in particular may constrain emotional understanding of emotional extremes, and maximize understanding of the emotional middle ground.

Tables

Table 1

Correlations, Means, Standard Deviations, and Range of Observed Study Variables

Variable		1	2	3	4	5	6	7	8
1. Intensity		---							
2. Clarity		.14	---						
3. Arousal		.47**	.05	---					
4. Task		.16	.42*	.09	---				
5. Granularity		.08	.64**	.05	-.37*	---			
6. Internal States		.09	.79**	.11	-.44**	.73**	---		
7. Identify		-.07	-.75**	-.10	.12*	-.84**	-.80**	---	
8. Difficulty		-.12	-.82**	.07	.21*	-.76**	-.74**	.84**	---
Total:	*M*	4.62	3.96	4.97	433	4.12	5.45	5.02	5.11
	SD	1.74	1.57	1.12	114	2.01	1.97	1.63	1.20
	Range	1-7	1-7	1-9	612	1-7	1-7	1-7	1-7
Love:	*M*	4.94^{a}	4.42^{a}	5.15^{a}	413^{a}	4.84^{a}	5.94^{a}	3.71^{a}	5.22^{a}
	SD	1.92	1.64	1.88	109	1.81	1.91	1.98	2.16
	Range	1-7	1-7	1-9	654	1-7	1-7	1-7	1-7
Break:	*M*	5.12^{a}	4.87^{a}	4.95^{a}	466^{a}	5.12^{a}	5.62^{a}	3.92^{a}	5.42^{a}
	SD	2.12	1.91	1.93	578	2.12	2.16	2.12	2.12
	Range	1-7	1-7	1-9	653	1-7	1-7	1-7	1-7
Control:	*M*	3.43^{b}	5.43^{b}	3.57^{b}	486^{a}	4.73^{a}	5.02^{b}	3.53^{a}	4.81^{a}
	SD	2.06	1.07	2.18	396	2.09	2.11	2.18	2.39
	Range	1-6	1-7	1-8	413	1-7	1-5	1-7	1-7

Note. Cognitive task time (in seconds) was scored such that higher scores suggest poorer performance, because the higher the scores, the longer it took participants to complete the task. Different superscript letters indicate values are significantly different from one another. * $p < .05$, ** $p < .01$;

Table 2

Model 1 - Hierarchical Multiple Regression Reporting the Change in Model Parameters

Model Parameters					Change Statistics		
Model	*R*	R^2	SE	SE	R^2_{change}	F_{change}	p_{change}
1	.21	**.04**	1.56	6.62	.04	6.62	.057
2	-.56	**.32**	1.35	64.52	**.28**	**57.9**	**< .001**

Table 3

Model 2 - Mediating and Indirect Effects

Path	Mplus estimates of Indirect effects			Sobel Test		95% CI
	IND	DIR	TOT	*z*	*p*	[low, up]
Linear: Intensity to Arousal to Clarity	.05	.07	.11	1.47	.143	-0.11, 0.17
Quadratic: Intensity to Arousal to Clarity	-.12*	-.29**	-.35**	2.59	.010	-0.13, -0.06
Quadratic: Intensity to Arousal to Performance	-.09*	-.18*	-.25*	2.02	.042	-0.09, -0.03

*$p < .05$., ** $p < .01$.

Table 4

Model 3 - Mediating and Indirect Effects

Path	Mplus estimates of Indirect effects			Sobel Test		95% CI
	IND	DIR	TOT	*z*	*p*	[low, up]
Linear: Intensity to Arousal to Clarity	.05	.03	.07	1.02	.131	-0.14, 0.08
Quadratic: Intensity to Arousal to Clarity	-.16*	-.39**	-.44**	2.59	.001	-0.22, -0.08
Quadratic: Intensity to Arousal to Performance	-.06*	-.17*	-.20*	2.02	.030	-0.09, -0.03

*p < .05., ** p < .01.

Figures

Figure 1

Study Timeline - Variables relevant to the present study are in bolded boxes below the horizontal axis.

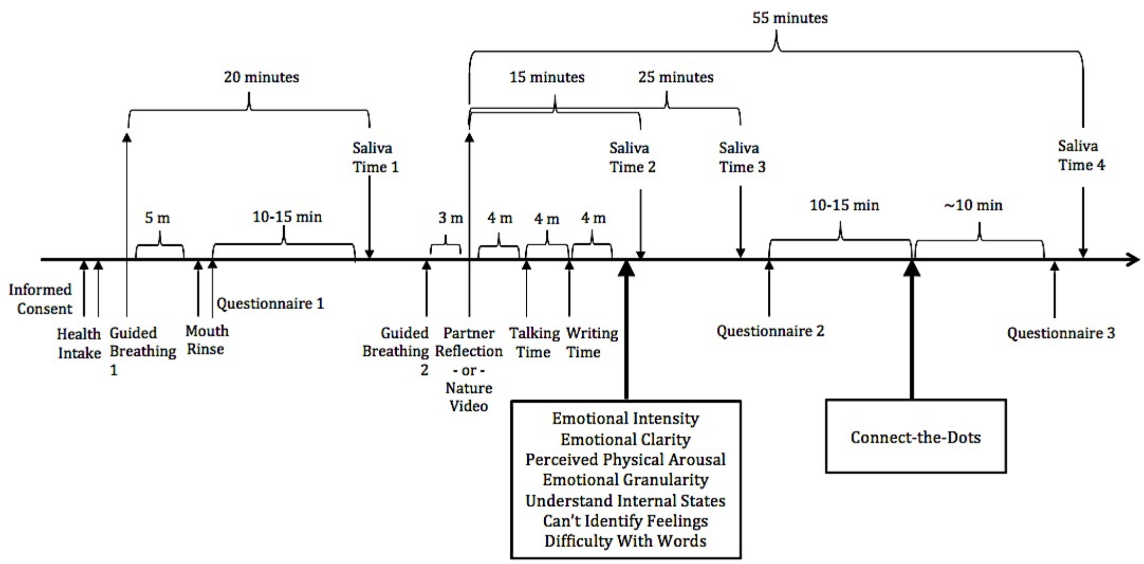


Figure 2

Model 1 - Scatterplot of Curvilinear Relationship Between Emotional Intensity and Emotional Clarity

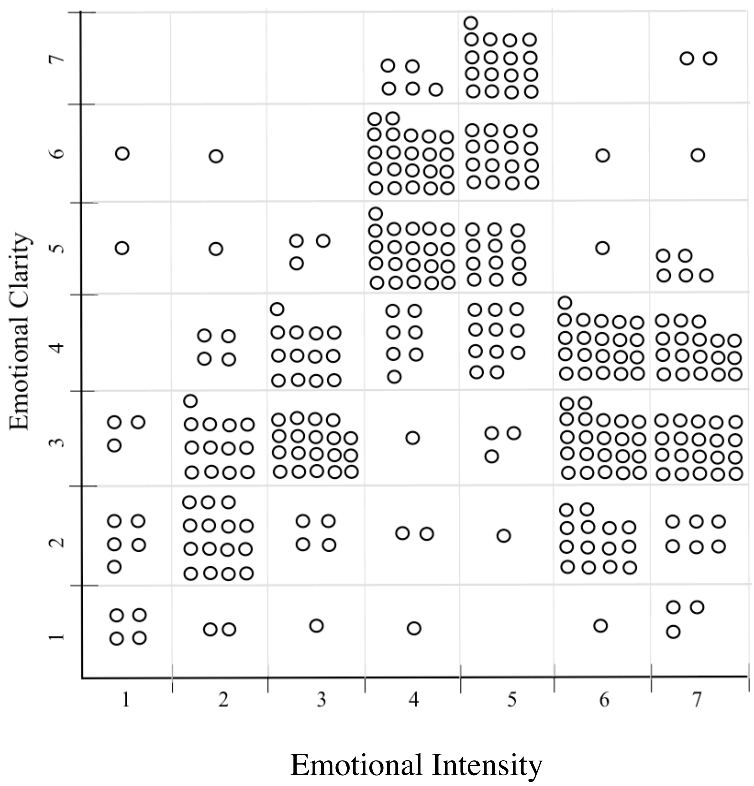
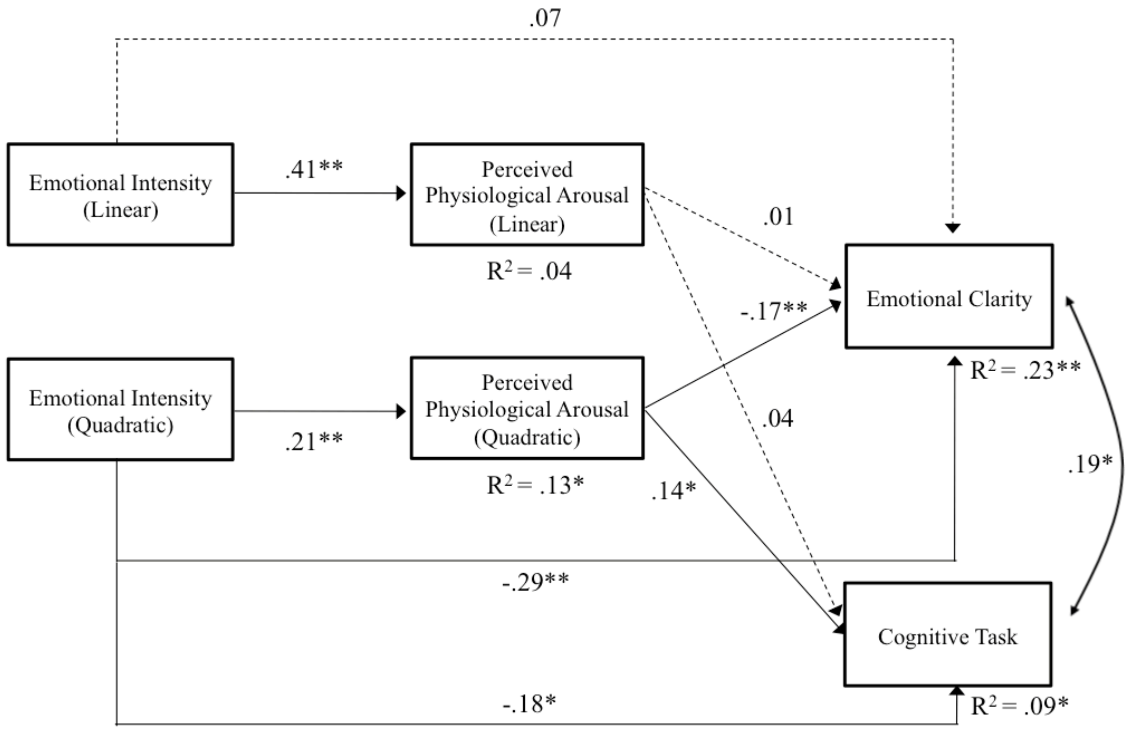


Figure 3

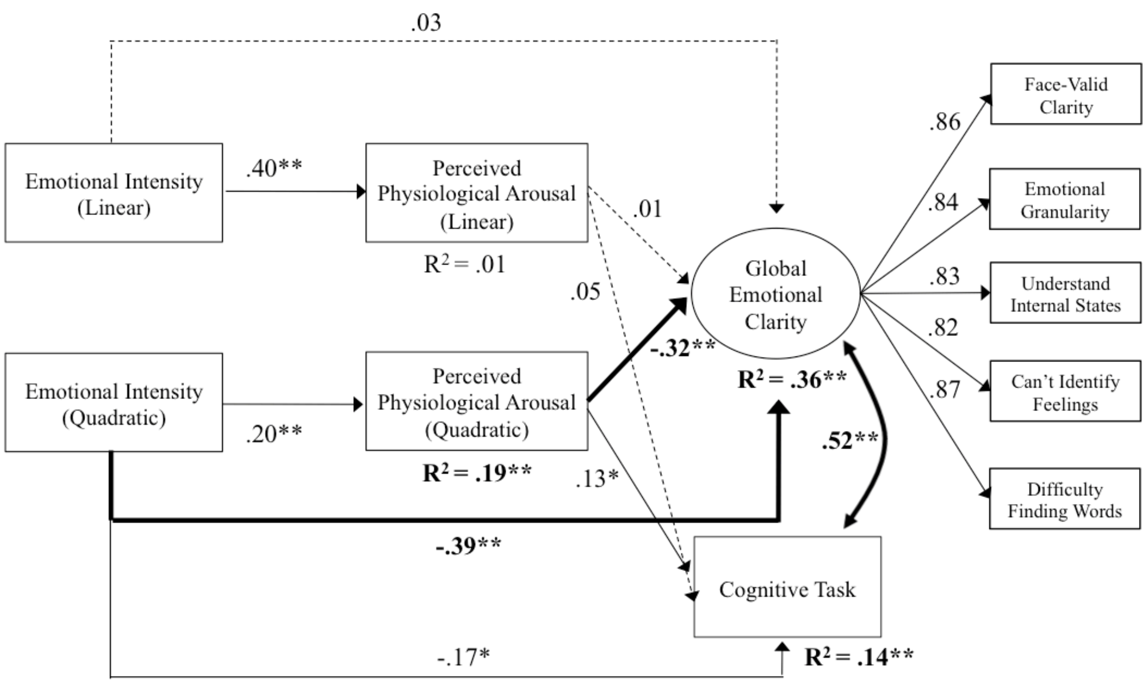
Model 2 - Standardized Coefficients for the Paths Between Emotional Intensity, Perceived Physiological Arousal, Emotional Clarity and Cognitive Performance



Note: Dashed lines represent non-significant paths.
*$p < .05$, **$p < .01$.

Figure 4

Model 3 - Standardized Coefficients for the Paths Between Emotional Intensity, Perceived Physiological Arousal, Emotional Clarity and Cognitive Performance



Note: Dashed lines represent non-significant paths.
**p* < .05, ***p* < .01.

Appendix A: Emotional and Physiological Measures

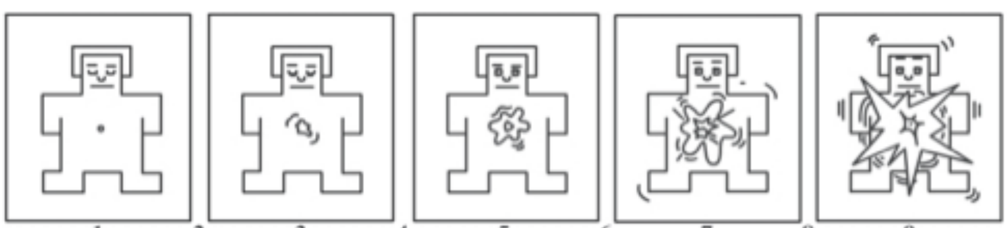
Please think about how you feel right now and answer these questions:

	Very Weak/Mild						Very Intense/Strong
Overall, how would you describe the strength of your emotions right now?	1	2	3	4	5	6	7

Please think about the talking and writing exercises you just completed & answer these questions:

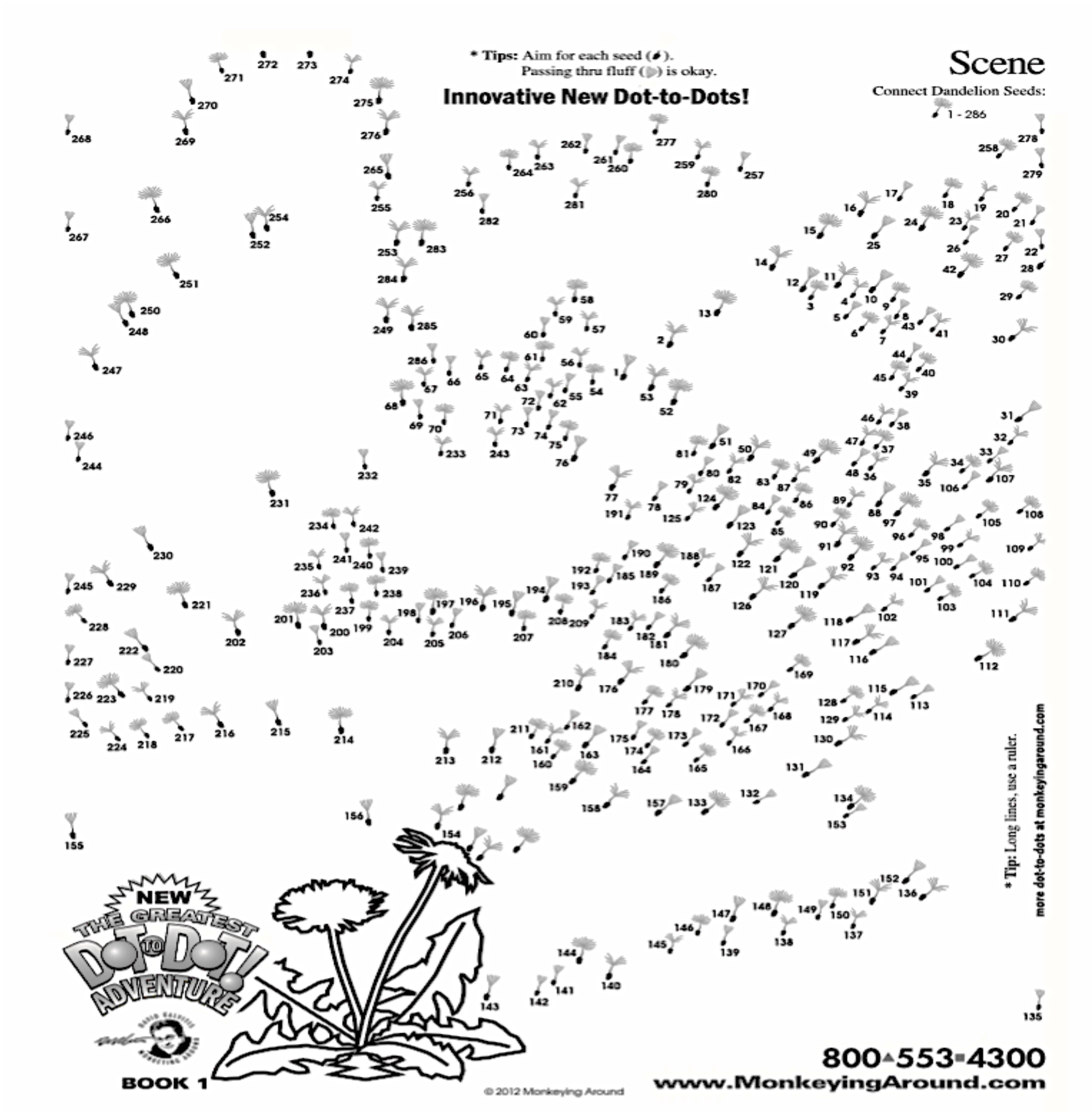
	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I feel like my emotions are clear and distinct, rather than just one big blob.	1	2	3	4	5	6	7
I feel like I understand what's going on inside of me right now.	1	2	3	4	5	6	7
I have feelings right now that I can't quite identify.	1	2	3	4	5	6	7
It was difficult for me to find the right words for my feelings.	1	2	3	4	5	6	7
	Not Clear At All			**Somewhat Clear**			**Extremely Clear**
Overall, how clear are your emotions to you right now?	1	2	3	4	5	6	7

Look at the pictures below. As you can see, the body of the person changes throughout the pictures. In some pictures, the person looks more activated than in other pictures. Please indicate how activated you feel right now by circling the number under the picture that best depicts how you feel. If you feel somewhat in between two of the pictures, select the number in between the pictures.



1 2 3 4 5 6 7 8 9

Appendix B: Connect-the-dots Task



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