Assessing the Motivational Dimensional Model of Emotion-Cognition Interaction: Comment on Domachowska, Heitmann, Deutsch, et al., (2016)

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Abstract

Domachowska, Heitmann, Deutsch, et al., (2016) conducted a rigorous direct replication and conceptual extension of one of our past studies examining the influence of high approach-motivated positive affect on attentional scope (Gable & Harmon-Jones, 2008, Study 2). We applaud their careful, thorough investigation and conceptual replication into this important area of emotion-cognition interaction. These studies raise interesting methodological questions for the study of motivation in positive affect. We respond to these questions and review evidence from our labs and others providing support for the Motivational Dimensional Model of affect. This work suggests that motivational intensity rather than affective valence alters attentional scope and cognitive scope more broadly. That is, affective states low in motivational intensity (e.g., amusement, sadness, postgoal positive affect) broaden cognitive scope, whereas affective states high in motivational intensity (e.g., desire, disgust, pregoal positive affect) narrow cognitive scope.

Domachowska, Heitmann, Deutsch, et al., (2015) conducted a direct replication and a conceptual extension of one of our past studies examining the influence of high approach-motivated positive affect on attentional scope (Gable & Harmon-Jones, 2008, Study 2). They provide a thorough direct replication and insightful conceptual replication of our initial research into the study of approach motivational intensity in positive affects. Since our seminal paper investigating the influence of approach-motivated positive affect on attentional scope was published seven years ago, it has received a great deal of attention in the literature. At the time of this writing, the paper has been cited over 300 times. There have been 13 studies across 10 articles replicating the effect that high approach-motivated positive affects narrow attention, as measured by the local-global tasks (Navon, 1977; Kimchi & Palmer, 1982) we used in our original article (Gable & Harmon-Jones, 2010a, 2011a; Gable, Mechin, & Neal, in press; Hicks, Friedman, Gable & Davis, 2012; Hicks, Fields, David, & Gable, 2015; Harmon-Jones & Gable, 2009; Juergensen & Demaree, 2015; Liu, Zhang, Zhou, & Wang, 2014; Nittono, Fukushima, Yano, & Moriya, 2012; Orehek, 2009). Three of these studies have been direct replications of the original methodology, like the one completed by Domachowska and colleagues. Other studies have used different measures of attention to support the conceptual model (Finucane, 2011; Gable & Harmon-Jones, 2010b, 2010c; Gable, Poole, & Harmon-Jones, 2015; O'Toole, DeCicco, Hong, & Dennis, 2011; Price & Harmon-Jones, 2010). Most exciting have been the additional 16 published studies which have extended our theoretical model into other domains of research such as memory, categorization, perseverance/distractibility, embodiment, and neurophysiological processes (Gable & Harmon-Jones, 2011b, 2012; Greenaway, Storrs, Philipp,

Louis, Hornsey, & Vohs, 2016; Hart & Gable, 2013; Liu & Wang, 2014; McGregor, Nash, Mann, & Phills, 2010; Smallman & Roese, 2008).

We would like to thank the replication team for the care taken to replicate - as directly as possible - our original work. Specifically, the authors contacted us to use our exact affective and neutral picture set and original Navon letter stimuli. Moreover, the authors used the original experimenter script, even learning the stimulus presentation software required to use the original presentation timing and format. The team sought to emulate stimulus presentation as much as possible with the original study. In addition to the careful replication, the authors provide some novel extensions in a follow-up study. First, the replications were conducted in a sample with a non-North American cultural background (i.e., participants from Dresden, Germany). Second, the team investigated the cultural influence of dessert preferences and found that a novel set of dessert stimuli also narrowed attentional scope. Third, the authors created a low approach-motivated positive affect image set. These images were found to evoke greater desire than neutral pictures, but less desire than the high approach-motivated positive pictures. Finally, the authors had the same participants view both low and high approach-motivated pictures in the same study. Together, these extensions help to extend the boundary conditions of the influence of high approach-motivated positive affect on attention.

Considering Goal Motivation in Positive Affect States

In discussing their findings and those from Gable and Harmon-Jones (2008), Domachowska et al., (2016) wrote, “future research should aim at further clarifying the inner affective and motivational conditions that modulate attentional breadth, preferably by

manipulating these conditions in a more direct manner than by presenting natural stimuli" (p. 20-21). We have published evidence that bears on this issue (Gable & Harmon-Jones, 2011b). In two experiments, we manipulated high approach-motivated positive affect using a pregoal positive affect, and in the same experiment, manipulated low approach-motivated positive affect using the postgoal positive affect. Pregoal and postgoal states were manipulated using a monetary incentive delay task created by Knutson and colleagues (e.g., Cooper, Hollon, Wimmer, & Knutson, 2009; Knutson & Greer, 2008; Knutson, Westdorp, Kaiser, & Hommer, 2000; Knutson & Wimmer, 2007). In the task, cues (white circle or square) indicating the possibility of gaining money for subsequent task performance are used to evoke pregoal (high approach) positive affect; to evoke postgoal (low approach) positive affect, different cues indicating feedback about the outcome of the task performance (i.e., whether a reward was obtained) are used. In our experiments (Gable & Harmon-Jones, 2011b), we measured attentional narrowing/broadening using the Navon (1977) letters task. We found that participants had a more narrowed attentional scope after pregoal positive affect cues than after postgoal positive affect cues. Price and Harmon-Jones (2010) used an embodiment manipulation to evoke low vs. high approach-motivated positive affect, and they too found that this manipulation influenced cognitive scope in the predicted manner.

According to our model, the narrowing or broadening of cognitive scope by motivational intensity is not limited to attentional processes. Cognitive scope refers to how broadly versus narrowly a person attends to and incorporates information. As such, narrowing and broadening may also extend to other cognitive processes, such as memory. Gable and Harmon-Jones (2010c) manipulated high versus low approach-motivated positive affect using a similar modified monetary incentive delay paradigm as the previous study. Central or peripheral memory was

measured by assessing recognition memory for neutral words that were presented either in the center of the computer monitor or in the periphery of the computer monitor after the pregoal and postgoal cues. Results indicated that memory for centrally presented words was better following the pregoal positive affect cues than the pregoal neutral cues. In contrast, memory for peripherally presented words was better following the postgoal positive affect cues than postgoal neutral cues. These results demonstrated the predicted effects on recognition memory.

High approach-motivated (pregoal) positive affect states encourage tenacious goal pursuit and narrow cognitive scope. As such, Gable, Threadgill, and Adams (in press) investigated whether pregoal positive states enhance neural correlates of motor-action preparation and whether these neural correlates of motor-action preparation relate to cognitive narrowing as measured by central-peripheral memory. Specifically, we investigated motor-action preparation during pregoal and postgoal states using an index of beta suppression over the motor cortex. Results revealed that beta suppression was greatest in pregoal positive states, suggesting that higher levels of motor-action preparation occur during high approach-motivated positive states. Furthermore, beta suppression in pregoal positive states related to greater cognitive narrowing. These results suggest that approach-motivated pregoal states appear to engage neural substrates of motor-action preparation and motor-action preparation relates to the degree of cognitive narrowing.

The Motivational Dimensional Model in Time Perception and Performance

The replication by Domachowska et al. (2016) focused on our research examining the influence of high approach-motivated positive affects on cognitive processes of attention and

memory. However, positive states varying in motivational intensity likely influence perceptual and behavioral processes as well. Below, we review some of our past work examining the influence of motivational intensity in positive affects on measures of time perception and performance.

Time Perception

Until recently, studies of affect and time perception have focused on affective valence, comparing positive states to negative states (see Droit-Volet & Gil, 2009, for review). These studies have demonstrated that positive affective states cause individuals to perceive time as passing faster, while negative affective states cause individuals to perceive time as passing slower (Angrilli, Cherubini, Pavese, & Manfredini, 1997; Droit-Volet, Brunot, & Niedenthal, 2004). We proposed that motivational direction and intensity, rather than affective valence, may be driving the perception of time in emotional states. That is, approach-motivated states may cause time to be perceived as passing more quickly than withdrawal-motivated states, and this is enhanced in states with higher motivational intensity.

The perception of time passing quickly in high approach-motivated states may assist with tenacity during goal pursuit. To test this hypothesis, Gable and Poole (2012) compared the influence of approach-motivated positive states on time perception. Specifically, participants completed a temporal bisection task where they would judge various stimuli as being displayed for a long or short duration. Results showed that pictures evoking high approach-motivated positive affect were perceived as passing more quickly than pictures evoking low approach-motivated positive affect. In a follow-up experiment, approach motivational intensity was manipulated independent of picture type by manipulating expectancy to act (Gable & Harmon-

Jones, 2008). Participants with an expectancy to act (higher approach motivation) judged time as passing faster than those without the expectancy to act. These results suggest that approach motivational intensity in positive affect states influence the perception of time. Together, these experiments suggest that the relationship between positive affect and time perception is driven by approach motivation, rather than affective valence.

Performance

Our conceptual model hypothesizes that the narrowing of cognitive scope may facilitate goal pursuit. Considering the dimension of motivational intensity, high approach-motivated positive affects are presumed to be preparatory states that facilitate goal pursuit (Gable, Threadgill, and Adams, in press; Harmon-Jones, Price, & Gable, 2012). Based on this idea, Hart and Gable (2013) proposed that motivational intensity within positive affect would enhance goal pursuit. Participants were induced into a high approach-motivated positive state, low approach-motivated positive state, or neutral state by responding to different essay prompts (Harmon-Jones, Harmon-Jones, Fearn, Sigelman, & Johnson, 2008). Goal state was manipulated by priming participants with goal-relevant action (e.g., doing, action, go), or neutral words in a word-completion task. Participants presented with action (rather than neutral) words should experience greater goal activation. Performance of goal activation was assessed using GRE-like verbal and quantitative questions (Albarracin & Hart, 2011). As predicted, participants in the high approach-motivated positive condition performed significantly better than participants in the low approach-motivated positive condition, when they were primed with the goal to act. These results were conceptually replicated and extended by examining goal-performance under pregoal and postgoal positive affect states using the modified monetary incentive delay paradigm

(Gable, Hart, Threadgill, & Adams, 2015). Together, five experiments reveal that participants performed better at a goal if the goal was accompanied by high approach-motivated positive affect. Motivational intensity in positive affect acts to facilitate goal pursuit.

Conclusion

Much current work investigating the influence of positive affect on cognitive scope tends to treat all positive affect as the same and disregards the role of motivational intensity. In addition, most work only compares low approach-motivated positive states to negative states, thus confounding affective valence with motivational intensity. However, low approach-motivated positive states are not the only type of positive affect individuals experience. The desire for a delicious meal, the enthusiasm for an attractive person, and the excitement of goal-pursuit are everyday experiences. The body of research from us and others based on the Motivational Dimensional Model highlights the importance of investigating motivational intensity in positive and negative affect states. Pursuit of this area of research is critical to more fully understanding the impact our emotions have on attentional, perceptual, and behavioral processes.

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