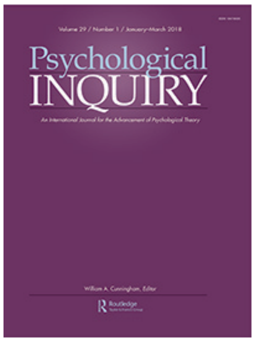

Routledge
Taylor & Francis Group

Psychological Inquiry

An International Journal for the Advancement of Psychological Theory

ISSN: 1047-840X (Print) 1532-7965 (Online) Journal homepage: http://www.tandfonline.com/loi/hpli20

Clarifying the Explanatory Scope of the Dual Implicit Process Model

David S. March, Lowell Gaertner & Michael A. Olson

To cite this article: David S. March, Lowell Gaertner & Michael A. Olson (2018) Clarifying the Explanatory Scope of the Dual Implicit Process Model, Psychological Inquiry, 29:1, 38-43

To link to this article: https://doi.org/10.1080/1047840X.2018.1435622

PSYCHOLOGICAL INQUIRY
2018, VOL. 29, NO. 1, 38–43
https://doi.org/10.1080/1047840X.2018.1435622

Routledge
Taylor & Francis Group

REPLY

Clarifying the Explanatory Scope of the Dual Implicit Process Model

David S. March, Lowell Gaertner, and Michael A. Olson

Department of Psychology, University of Tennessee, Knoxville, Tennessee

We thank the commentators for such thought-provoking and insightful critiques of our target article (March, Gaertner, & Olson, this issue). Their varied theoretical orientations provided interesting analyses and challenging assessments of our dual implicit process model (DIPM). We organized our response into three sections. Some of the issues identified in the commentaries suggest a need to clarify the explanatory goals of the DIPM. So, we capitalize on this unique opportunity and first clarify the scope of the model by addressing what it is and what it is not. Next, we consider common issues expressed across commentaries. Finally, we consider idiosyncratic issues unique to particular commentaries.

Clarifying the DIPM: What It Is and Is Not

What the DIPM Is

The DIPM is a *functional* (i.e., rooted in evolutionary survival) model of evaluative processing that addresses when it is that stored evaluations influence judgment and behavior. The novel aspect of the DIPM is the distinction between threat and valence evaluative processing. In particular, the DIPM distinguishes a slower and more controlled explicit process (e) from two implicit processes: the first implicit process (i1) is solely tuned to immediate threats to bodily harm and precedes and potentially influences the second implicit process (i2), which is tuned to valence (i.e., negative to positive). As Xu and McGregor (this issue) imply, the DIPM employs a narrow definition of threat that deviates from broader uses in the psychology literature (e.g., threats to self-esteem, relationships, resources). Our narrow definition is purposeful and appropriate because the DIPM integrates dual-process models of evaluation with a threat detection literature (e.g., Blanchette, 2006; Öhman & Mineka, 2001) that identifies early and privileged responses (short latency of detection, strong reflexive reaction, fast physiological response) to threats of immediate bodily harm. As Ruisch, Cone, Shen, and Ferguson (this issue) note, objects that can cause harm come in all shapes and sizes: from a Chihuahua to a Rottweiler. The DIPM accounts for such quantitative differences in an object's ability to inflict harm via the prediction that an object's threat imminence and potency together influence the implicit threat process (i.e., i1).

Ruisch et al. (this issue) and Xu and McGregor (this issue) suggest, and we agree, that both a snarling dog and a sick person represent the possibility of bodily harm (the dog via physical injury and the sick person via disease contamination). We disagree, however, with their supposition that those types of stimuli fail to elicit different responses. To clarify what constitutes an immediate threat to bodily harm and thereby have the potential to activate the i1 process, it might be useful to think about active versus passive threats. An active threat is one that requires action to avoid and a passive threat is one that requires inaction to prevent encountering. The snarling dog necessitates quick responding to prevent harm (i.e., active threat). With the sick person, all one must do is not approach (i.e., passive threat): Without initiating contact, the risk of harm from the sick person is minimal. Of course, if the sick person suddenly charges in an effort to spread disease (like a zombie), she or he becomes an active threat and could elicit an i1 response. Contrary to Xu and McGregor's assertion that "given the importance of disgust in pathogen avoidance and survival, disgust-inducing stimuli should be attended to first" (p. 36), eye-tracking research indicates that initial attention is drawn more frequently to threatening than disgusting stimuli (March, Gaertner, & Olson, 2017).

What the DIPM Is Not

The DIPM is not a model of representation. Ruisch et al. (this issue) comment on our lack of specificity regarding the integration of associative versus propositional information into our processes. Instead of a model of representation, the DIPM is a functional model of evaluative responding. However, it is consistent with models of evaluation that make predictions about evaluation representation in memory. It is likely, as both the motivation and opportunity as determinants model (Fazio, 1990; Fazio & Olson, 2014) and associative-propositional evaluation model (Gawronski & Bodenhausen, 2006) argue, that fast-activating evaluative responses, such as those characterizing i1 and i2, are represented associatively. That is, evaluations capable of automatic activation are stored, not constructed (cf. Schwarz, 2007), and capable of spreading activation (although it is worth noting that neural network models can also account for these effects; e.g., Conrey & Smith, 2007). This is not to say that such evaluative associations change more slowly than propositional knowledge, as other models argue (e.g., Rydell & McConnell, 2006). Indeed, automatic evaluative responses are capable of fast change (Cone, Mann, & Ferguson, 2017; De Houwer, 2006), and people appear to be particularly adept at quickly acquiring threat responses (e.g., Öhman, Eriksson, &

CONTACT David S. March dmarch@vols.utk.edu Department of Psychology, University of Tennessee, Knoxville, TN 37996, USA.

Olofsson, 1975). Finally, we also suggest that the DIPM's e processing route is largely propositional in nature, in accordance with the models of evaluation described above.

The DIPM is not a model of all threats broadly defined—it is specified only for threats to immediate bodily harm. Xu and McGregor (this issue) draw parallels between the DIPM and terror management theory (TMT; Greenberg et al., 1990; Pyszczynski, Greenberg, & Solomon, 1999) and reinterpretations via uncertainty (McGregor, Zanna, Holmes, & Spencer, 2001). Although both involve self-preservation, they address vastly different phenomenon and transpire across different time scales. TMT is an existential theory that focuses on humans' cognitive capacity to reflect upon their own mortality and the means by which they buffer themselves from that ultimate "terror." Such terror and the numerous ensuing effects arise from a slow and deliberative processes of contemplating one's demise followed by processes occurring beyond awareness. Indeed, TMT effects necessitate a delay between the deliberative contemplation of mortality and the measured outcomes (Greenberg, Vail, & Pyszczynski, 2014; Pyszczynski et al., 1999). TMT effects transpire in minutes. The DIPM's i1 transpires in milliseconds. TMT concerns existential dread. The DIPM's i1 concerns fast detection and reaction to threats to bodily harm. They are apples and oranges.

The DIPM is not a model attempting to catalogue an exhaustive list of the myriad specific behavioral responses to threat. Silston and Mobbs (this issue) outline an account of defensive reactions controlled by a survival optimization system that thoroughly describes the strategies organisms use to combat threats (i.e., beginning with prediction, then prevention, followed by threat orienting in the presence of a threat, assessment of strategies one can use to mitigate the threat, and finally defensive strategies evoked). They situate i1 between what they identify as "threat orienting" and "threat assessment," just after the threat is encountered, and note that the DIPM lacks ecological specificity regarding threat responding. Although we describe some of the many physiological and behavioral outcomes produced by i1, a highly specified mapping of all responses is beyond the scope of the model. An already mature body of research has done well specifying the types of responses elicited by threats (though mostly in animals; e.g., Löw, Lang, Smith, & Bradley, 2008; Löw, Weymar, & Hamm, 2015; Mobbs et al., 2007). The DIPM is broader than simply detailing possible responses threats. It integrates implicit threat and valence processing with explicit processing and goes beyond a survival optimization system–type model to include the evaluation of nonthreatening objects as well as the influence of threat processing on such evaluation.

The DIPM is not a neurological model and does not provide or propose a one-to-one mapping onto unique neural circuitry (i.e., Ruisch et al.'s neural specificity). We buttressed the DIPM's functional distinctions with the neurological plausibility that LeDoux's (1996, 2012) "low" and "high" roads enable rapid versus comprehensive evaluation. For us, the neurology is complementary; our concern here is only with neurological plausibility. Our focus was to provide functional distinctions. In that spirit, we certainly appreciate Amodio and Berg's (this issue) suggestion of specifying the particular amygdala subnuclei underlying i1. But such neural specificity is beyond the scope of the DIPM. We are happy to leave the task of specificity to neuroscientists who are inclined and positioned to provide such one-to-one mappings with the understanding that such pathways are likely to be highly distributed.

Common Issues

Is i1 Prioritized in Terms of Activation, Speed, or Threshold?

In our target article, we reviewed a threat perception literature indicating that the mind preferentially processes threatening stimuli over negative and positive stimuli. The DIPM attributes such threat processing to i1 and proposes a serial process whereby i1 assesses the threatening stimuli and initiates responses before i2 assesses negative or positive stimuli. As both Amodio and Berg (this issue) and Silston and Mobbs (this issue) noted, a parallel process could account for the dynamics of the DIPM. We concede that we portrayed i1 as beginning prior to i2, which unfortunately had the consequence of muddying the DIPM's actual focus on response. As Figure 1 in the target article portrays, the DIPM predicts the time course of response but notably allows for parallel processing. We do not wish to make strong claims about order of onset, but rather about order of output.

There are three ways to account for our proposed primacy of i1 over i2 and e in regard to order of output: (a) i1 activates prior to i2; (b) i1 and i2 activate simultaneously (i.e., in parallel) with i1 processing stimuli more quickly than i2; and (c) i1 and i2 activate simultaneously and have equal processing speed, but i1 requires less input and depth of processing. Each of these three possibilities can explain threat superiority effects, and of course these possibilities are not mutually exclusive. Even in a dynamic in which i1 *is* activated prior to i2, i1 may also process faster than i2 and require less input to evoke an output than i2. Granting i1 an advantage over i2 in terms of activation, speed, and threshold is congruent with LeDoux's (1996, 2012) and with Öhman, Lundqvist, and Esteves's (2001) ideas on the primacy of threat processing and research indicating that subliminal (i.e., degraded) threatening stimuli uniquely influence processing relative to nonthreatening stimuli. Important to note, regardless of which of the preceding accounts is accurate, the functional result (in terms of evaluative response) is the same. The DIPM contends that i1 evokes an output that influences judgments and behavior before i2 or e.

Quantitative versus Qualitative Accounts of the i1/i2 Distinction

Ruisch et al. (this issue) and Xu and McGregor (this issue) question our qualitative conceptualization of the i1/i2 distinction. When considering the possibility that the i1/i2 distinction is quantitative, one difference between i1 and i2 would rest on the strength of the object-evaluation association. Many factors predict associative strength, including behavioral experience, emotional/affective intensity, rehearsal, and how integral the attitude is to the self-concept (Fazio, 1995). In a quantitative sense, the strongest associations are likely to be among attitudes that are highly emotionally based or integral to the self-concept.

These attitudes would then be activated more quickly and strongly than those not associated with emotionality or self-concept. However, we find it hard to reconcile such a quantitative account with findings of threat superiority effects when considering the stimuli used in those studies. The positive, negative, and threatening stimuli are all things toward which people, normatively speaking, have very accessible attitudes that are also emotionally based (e.g., puppies, babies, attractive individuals, guns, knives, cockroaches, vomit, dead animals). Hence, we find it unlikely that association-strength differences underlie reactions to the threatening versus positive or negative stimuli.

Ruisch et al. and Xu and McGregor offer additional alternative explanations for a quantitative distinction involving other dimensions of difference between the threatening and negative stimuli that we employed in our own primary studies (March et al., 2017). We review those alternative explanations and detail why they cannot account for our findings or refute a qualitative distinction between i1 and i2.

Extremity

Ruisch et al. (this issue) and Xu and MeGregor (this issue) state that the threatening stimuli utilized in our previous research (March et al., 2017) may have been more "extreme" than our negative stimuli. In particular, Ruisch et al. suggest the following:

> One salient dimension on which threatening and negative stimuli are likely to quantitatively differ is extremity – i.e., their degree of positivity or negativity. As an example, in addition to categorizing one as threatening and one as simply negative, we would also expect that the snarling Rottweiler would be seen as more negative than the (relatively harmless) snarling Chihuahua. (p. 23)

However, such an extremity difference cannot explain why participants evidenced stronger responses (in all three studies of March et al., 2017) to the threatening stimuli. As indicated in Table 1 of the online supplementary material for March et al., the threatening stimuli were rated as less "bad" (i.e., negative; $M = 4.40$) than were the negative stimuli ($M = 4.78$)—an empirical direction that is inconsistent with an extremity account.

Furthermore, Xu and McGregor apparently misunderstood how we pilot tested our stimuli when they suggested that an inconsistency in our coding system gave greater priority to threatening than negative stimuli such that

> to be categorized as a negative stimulus, the images only had to be greater than 3 on a 7-point negativity scale … to be categorized as a threat stimulus, the image had to be higher than the neutral point of 4 on a 7-point threatening rating scale. (p. 35)

That is not what we did. As detailed by March et al. (2017, p. 1521) we randomly assigned participants to rate the extent to which each image (1 = *not at all*; 7 = *extremely*) was perceived as good, bad, or threatening. All images we subsequently categorized as being negative or threatening had mean "good" ratings less than 3 and mean "bad" ratings greater than 3. What distinguished an image as being categorized as negative versus threatening was whether the image had a mean "threatening" rating less (or greater) than 4. The inconsistency and greater priority suggested by Xu and McGregor is just not there.

Arousal

Ruisch et al. (this issue) suggest that perhaps our threatening stimuli elicited stronger responses than our negative stimuli because the threatening stimuli were more arousing (e.g., Shimmack, 2005). Following conventional procedures (e.g., Kveraga et al., 2014; Lang, Bradley, & Cuthbert, 2008), we had 99 undergraduates rate the self-reported arousal of each of our images on a 7-point scale for which 1 was anchored by a cluster of low arousal traits (i.e., "relaxed, calm, sluggish, dull, sleepy, unaroused") and 7 was anchored by a cluster of high arousal traits (i.e., "agitated, stimulated, frenzied, wide-awake, aroused"). The threatening stimuli were rated as *less* arousing ($M = 5.04$) than the negative stimuli ($M = 5.39$), $F(1, 98) = 15.66$, $p = .001$. So greater arousal cannot explain why threatening (than negative) images were faster to detect, drew more frequent eye gaze, and elicited stronger startle-eyeblinks.

Rarity

Ruish et al. (this issue) suggest that our threatening stimuli may be less common than the negative stimuli and therefore command greater attention and a processing advantage because of their novelty (e.g., Bradley, Lang, & Cuthbert, 1993). We find this argument unlikely for two reasons. First, consider the nature of our images. Threatening images consisted of pictures of snarling predatory animals, snakes, poisonous insects, and pointed guns. Negative images consisted of pictures of dead and injured animals, maggots, di1rty teeth and toenails, vomit, trash, and feces. Are pictures of guns and predators really rare in the lived experiences of our 18- to 22-year-old college student participants? Television programs depict more than 800 acts of violence per hour (Beresin, 2009), and the typical American child views more than 200,000 televised acts of violence, including more than 16,000 murders before adulthood (Smith et al., 1998). With the prevalence of nature channels and programs, are images of predatory animals really rare? Second, and perhaps more to the point, stimulus novelty cannot explain why the threatening images elicited a stronger startle-eyeblink than did the negative (and positive and neutral) images (March et al., 2017, Study 3). Bradley et al. (1993) repeatedly exposed participants to the same set of three pleasant, neutral, and unpleasant pictures. Across presentations, the startle-eybelink decreased. However, the tendency for unpleasant pictures to elicit stronger startle-eyblinks than did the neutral and pleasant images did not decrease across presentations. That is, even with repeated exposure (i.e., decreased novelty), unpleasant images elicited a stronger response. In sum, we find it unlikely that our threatening images are more novel than our negative images. But if they are, such rarity cannot explain our full array of data.

Universality

Xu and McGregor (this issue) suggest that our threatening stimuli are less "universal" than our negative stimuli and thereby more amenable to contextual reinterpretation. They offer an example suggesting that a knife will be perceived to be less dangerous in the hands of a cook than a criminal but that a dead animal will be universally regarded as disgusting. We, and the DIPM, certainly agree that such reinterpretation is possible. However, in regard to the processes of the DIPM model, such reinterpretation is a slower downstream process. The i1 process, which elicits rapid responding, would process the knife as a potential threat regardless of who is holding it. Only after i1 plays out (very rapidly) would i2 and e have a chance to subsequently reinterpret the knife in the context of cook versus criminal. As Ruisch et al. (this issue) comment, a quickly moving teddy bear would elicit the same startle response as a quickly moving bear. Indeed, recall Darwin (1899) steeling himself against the snake in the glass tank. He knew it would attempt to strike and resolved not to react given the protective glass, yet when the puff adder struck he jumped back all the same. Again, i1 is a fast and reactive process functioning for protection. This is why our studies comparing threat versus negative (and positive and neutral) assessed fast initial responses (March et al., 2017). The DIPM certainly allows for contextual reinterpretation, but that is a delayed process occurring downstream of i1.

Ease of Recognition

Xu and McGregor (this issue) suggest that the threatening images were more easily recognizable than were the negative images. Indeed, this was a concern in the threat perception literature that lead to the use of schematic stimuli (i.e., replacing images of happy, sad, neutral, and angry faces with corresponding schematic-line drawings of those faces). Nonetheless, visual search paradigms using schematic faces revealed the same tendency for angry faces to be detected more quickly than the other faces (Öhman et al., 2001). So, ease of recognition cannot account for such threat superiority in visual search.

In our own research, in addition to visual search, we also employed eye-tracking and startle-eyeblink paradigms, which should be less susceptible to such an ease of recognition account. With eye-tracking, participants were more likely to gaze first at threatening stimuli when paired with negative, positive, or neutral stimuli. Participants were also more likely to gaze first at negative stimuli when paired with positive or neutral stimuli. Are we to believe, then, that the negative stimuli, which are ostensibly less recognizable than the threatening stimuli, are more recognizable than the positive and neutral stimuli? And if so, how could that explain why negative stimuli elicited a weaker startle-eyeblink than did the neutral stimuli (whereas the threatening stimuli elicited a stronger startle-eyeblink)? So, the ease of recognition explanation, like the other alternative explanations based on some quantitative distinction, cannot account for the full array of data.

Lumping or Splitting: What More Can a Model Do?

The DIPM adds further distinction to dual-process models by proposing an implicit evaluative threat process beyond the existing implicit evaluative valence process. Some commentators fall into a "lumpers" camp and question the utility of adding further distinctions, arguing that threat perception can be explained by existing processes/theories (Ruisch et al., this issue; Xu & McGregor, this issue). Other commentators fall into a "splitters" camp, arguing that the DIPM falls short in terms of specifying further distinctions that could delineate mental processes (Amodio & Berg, this issue; Keller, Harder, & Cesario, this issue ; Silston & Mobbs, this issue).

Lumping versus splitting is a philosophical debate in which theoreticians should engage. But balance is needed between extremes. One could offer a highly generalizable model with too little specificity. Or one could split evaluation into numerous processes and derive a model with many principles and insufficient generality. We believe that a single process is too simple to explain threat and valence processing and that radical modularity is too extreme. Is the i1/i2 distinction unnecessary? Extant data suggest not. Are further distinctions needed? Future research will determine. We believe the DIPM finds a Goldilocks zone. In lieu of specifying unique motor responses to, say, a spider versus a gun, or a good friend versus a chocolate bar, or, alternatively, ignoring the difference between a threat response and a negative evaluative response, the DIPM maintains a level of specificity well grounded in the evaluation literature and anchored to the concepts of approach and avoidance (Allport, 1935). Indeed, the DIPM's balance of specificity and generality enabled us (March et al., this issue) to extend testable insights into other areas of psychological science including prejudice, phobias, and intimate partner violence. What more can a model do?

Implicit versus Explicit: Does It Really Matter?

Keller et al. (this issue) note that we, along with most theorists, lack specificity as to which components of automaticity (speed, effort, intentionality, and controllability) are most relevant to our model. In the target article, we propose that i1 responses are quick, are efficient, are exerted without intent, and run to completion with little opportunity for interruption. Although the four horsemen of automaticity may sometimes ride alone, they typically ride together when the object being evaluated is threatening. Thus, we did not see value in attempting to determine which horseman is riding the biggest horse. Amodio and Berg (this issue) contend, and we agree, that acknowledging the mere implicitness of a process is important. Even when the horsemen ride alone (e.g., when one is aware of an attitude yet, nonetheless, expresses it in behavior without intention), understanding that a process is implicit is an important part of understanding the eventual judgment and behavior. The implicit distinction really does matter.

Idiosyncratic Issues

Why We Appreciate, but Did Not Reference, the Memory Systems Model

Amodio and Berg (this issue) were surprised that we did not review the memory systems model (MSM; Amodio, 2008; Amodio & Ratner, 2011) given that it ostensibly argues the same point as the DIPM. The MSM, however, does not make the same conceptual distinction as does the DIPM. The major contribution of the MSM is distinguishing the separable influences of semantic knowledge and affect on judgment and behavior. Granted that much of the MSM focuses on affect involves threat and fear conditioning, the model does not differentiate threat from negativity. That is, the unique contribution of the DIPM (i.e., threat via i1 and negative to positive via i2) is conflated in the MSM. Threat and valence are equated in the MSM as affect. Such conflation can be seen in work relevant to the MSM. For example, in a series of studies that revealed the separate effects of semantic and affective processes in White American's behavior toward African Americans, Amodio and Devine (2006) operationalized their affective construct with an evaluative Implicit Association Test in which the unpleasant category grouped together words, which in terms of the DIPM separately reflect negative valence (e.g., poverty, vomit) and threat (e.g., bomb, murder). Of course, our intention is not to diminish the importance of the MSM and related work. The latter Amodio and Devine publication offers an important contribution to the understanding of discrimination. We certainly appreciate the MSM. But it does not argue the same point as the DIPM.

Does the DIPM Lack Prediction?

Silston and Mobbs (this issue) make a compelling case for including "prediction" as an important feature ostensibly lacking in the DIPM. By prediction they mean a pervasive mental process utilizing stored knowledge to facilitate perception of threat and guide motor responses. Such prediction enables humans to make more accurate evaluations of an ensuing but not yet detected threat. In their view, the DIPM portrays threat evaluation as a stimulus-response process that begins only when a threat is encountered. This implies a relatively static mechanism, which we did not intend to imply. Evaluation is a rolling process that that plays out in an ever-unfolding world. Processing occurs iteratively (Cunningham, Zelazo, Packer, & Van Bavel, 2007), with new information updating previous information and prior information influencing the processing of new information (e.g., priming). Silston and Mobbs cogently summarized the DIPM:

> In one instance we may be in e while the next we are in i1/i2, and then back to e if we have escaped or are distant from the threat. In circumstances in which e has been engaged but threat is still present and danger may become imminent, e may have specific effects on i1 / i2 that would be absent if danger was not sensed or perceived before the threat appeared. In this context, awareness of potential threat, knowledge and experience with specific threats, interact with current motivational state and result in preparedness and anticipatory sensitivity that may impact subsequent i1 or i2. (p. 30)

The DIPM incorporates prediction because stored evaluations of threatening, negative, and positive objects facilitate responding to those objects as a function of the context in which they are encountered. Walking through tall grass is likely to provide some activation of the concept of snake (as well as other relevant concepts like allergies and rabbits), insofar as representations of snakes include contexts in which they occur, just as being in a dark room facilitates startle response (Grillon, Pellowski, Marikangas, & Davis, 1997). Encountering a snake in a field (relative to an office building) would likely facilitate an i1 response. Hence, the DIPM allows for prediction. Indeed, in the target article we contemplated the possibility that an initial i1 activation (such as the dark room) strengthens an immediately subsequent i1 activation (see the current target article by March et al., Figure 3, and the corresponding section, Summation of Successive i1 Events). This is clearly prediction, as the system uses previous information to guide subsequent processing.

Can i2 Downregulate i1?

In the target article, we suggested that i1 is less susceptible to downregulation from i2 than i2 is from e. We then further considered whether i1 is even amenable to downregulation at all. The imbalanced connections between the amygdala and cortices certainly imply that during the initial processing of a threatening stimulus i1 informs i2 and e more than the reverse. Amodio and Berg (this issue, p. 14) provide a good review of neuroanatomical patterns and functions that cast further doubt on the possibility that i2 directly downregulates i1 and suggest, instead, that i2 might do so indirectly by influencing the behavioral (i.e., motor) outputs of i1. We certainly welcome this clarification.

Conclusion

The DIPM proposes that threat is evaluated distinctly from valence. The model stems from a well-established literature on threat perception and our own research demonstrating that threatening stimuli are processed preferentially from negative, positive, and neutral stimuli. By integrating the threat literature into dual-process models of evaluation, the DIPM paints a fuller picture of the evaluative process operating in the human mind. We thank the commenters for their thorough and challenging critiques, as well as their efforts to identify ways in which we could clarify, extend, and enhance our model. We look forward to continuing our work exploring the DIPM and hope that others find utility in applying it to their own research.

References

Allport, G. W. (1935). Attitudes. In C. Murchison (Ed.), *Handbook of social psychology*, pp. 798–844. Worcester, MA: Clark University Press.

Amodio, D. M. (2008). The social neuroscience of intergroup relations. European *Review of Social Psychology*, *19*, 1–54.

Amodio, D. M., & Devine, P. G. (2006). Stereotyping and evaluation in implicit race bias: Evidence for independent constructs and unique effects on behavior. *Journal of Personality and Social Psychology*, *91*, 652–661. doi:10.1037/0022-3514.91.4.652

Amodio, D. M., & Ratner, K. G. (2011). A memory systems model of implicit social cognition. *Current Directions in Psychological Science*, *20*, 143–148. doi:10.1177/0963721411408562

Beresin, E. V. (2009). The impact of media violence on children and adolescents: Opportunities for clinical interventions. *American Academy of Child Adolescent Psychiatry, The DevelopMentor*. Retrieved from http://www.aacap.org/cs/root/developmentor/the_impact_of_media_violence_on_children_and_adolescents_opportunities_for_clinical_interventions

Blanchette, I. (2006). Snakes, spiders, guns, and syringes: How specific are evolutionary constraints on the detection of threatening stimuli? *The Quarterly Journal of Experimental Psychology*, *59*, 1484–1504. doi:10.1080/02724980543000204

Bradley, M. M., Lang, P. J., & Cuthbert, B. N. (1993). Emotion, novelty, and the startle reflex: Habituation in humans. *Behavioral Neuroscience*, *107*, 970–980. doi:10.1037/0735-7044.107.6.970

Cone, J., Mann, T. C., & Ferguson, M. J. (2017). Changing our implicit minds: How, when, and why implicit evaluations can be rapidly revised. In Advances in Experimental Social Psychology (Vol. 56, pp. 131–199). Academic Press.

Conrey, F. R., & Smith, E. R. (2007). Attitude representation: Attitudes as patterns in a distributed, connectionist representational system. *Social Cognition*, *25*, 718–735. doi:10.1521/soco.2007.25.5.718

Cunningham, W. A., Zelazo, P. D., Packer, D. J., & Van Bavel, J. J. (2007). The iterative reprocessing model: A multilevel framework for attitudes and evaluation. *Social Cognition*, *25*, 736–760. doi:10.1521/soco.2007.25.5.736

Darwin, C. (1899). *The expression of emotion in man and animals*. New York, NY: Appleton.

De Houwer, J. (2006). Using the implicit association test does not rule out an impact of conscious propositional knowledge on evaluative conditioning. *Learning and Motivation*, *37*, 176–187. doi:10.1016/j.lmot.2005.12.002

Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The MODE model as an integrative framework. *Advances in Experimental Social Psychology*, *23*, 75–109. doi:10.1016/S0065-2601(08)60318-4

Fazio, R. H. (1995). Attitudes as object-evaluation associations: Determinants, consequences, and correlates of attitude accessibility. *Attitude strength: Antecedents and consequences*, *4*, 247–282.

Fazio, R. H., & Olson, M. A. (2014). The MODE model: Attitude-Behavior Processes as a function of motivation and opportunity. In J. W. Sherman, B. Gawronski, & Y. Trope (Eds.), *Dual-process theories of the social mind*, pp. 151–171. New York, NY: Guilford Press.

Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin*, *132*, 692–731. doi:10.1037/0033-2909.132.5.692

Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management II: The effects of mortality salience on reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology*, *58*, 308–318. doi:10.1037/0022-3514.58.2.308

Greenberg, J., Vail, K., & Pyszczynski, T. (2014). Terror management theory and research: How the desire for death transcendence drives our strivings for meaning and significance. In A. J. Elliot (Ed.), *Advances in motivation science* (Vol. 1, pp. 85–134). Amsterdam, the Netherlands: Elsevier.

Grillon, C., Pellowski, M., Merikangas, K. R., & Davis, M. (1997). Darkness facilitates the acoustic startle reflex in humans. *Biological Psychiatry*, *42*, 453–460. doi:10.1016/S0006-3223(96)00466-0

Kveraga, K., Boshyan, J., Adams, R. B., Mote, J., Betz, N., Ward, N., … Barrett, L. F. (2014). If it bleeds, it leads: Separating threat from mere negativity. *Social Cognitive and Affective Neuroscience*, *10*, 28–35. doi:10.1093/scan/nsu007

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (2008). International affective picture system (IAPS): Affective ratings of pictures and instruction manual. Technical Report A-8. University of Florida, Gainesville, FL.

LeDoux, J. E. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York, NY: Simon and Schuster.

LeDoux, J. E. (2012). Rethinking the emotional brain. *Neuron*, *73*, 653–676. doi:10.1016/j.neuron.2012.02.004

Löw, A., Lang, P. J., Smith, J. C., & Bradley, M. M. (2008). Both predator and prey: Emotional arousal in threat and reward. *Psychological Science*, *19*, 865–873. doi:10.1111/j.1467-9280.2008.02170.x

Löw, A., Weymar, M., & Hamm, A. O. (2015). When threat is near, get out of here dynamics of defensive behavior during freezing and active avoidance. *Psychological Science*, *26*, 1706–1716. doi:10.1177/0956797615597332

March, D. S., Gaertner, L., & Olson, M. A. (2017). In harm's way: On preferential response to threatening stimuli. *Personality and Social Psychology Bulletin*, *43*, 1519–1529. doi:10.1177/0146167217722558

McGregor, I., Zanna, M. P., Holmes, J. G., & Spencer, S. J. (2001). Compensatory conviction in the face of personal uncertainty: Going to extremes and being oneself. *Journal of Personality and Social Psychology*, *80*, 472–488. doi:10.1037/0022-3514.80.3.472.

Mobbs, D., Petrovic, P., Marchant, J. L., Hassabis, D., Weiskopf, N., Seymour, B., … & Frith, C. D. (2007). When fear is near: Threat imminence elicits prefrontal-periaqueductal gray shifts in humans. *Science*, *317*, 1079–1083. doi:10.1126/science.1144298

Öhman, A., Eriksson, A., & Olofsson, C. (1975). One-trial learning and superior resistance to extinction of autonomic responses conditioned to potentially phobic stimuli. *Journal of Comparative and Physiological Psychology*, *88*, 619–627. doi:10.1037/h0078388

Öhman, A., Lundqvist, D., & Esteves, F. (2001). The face in the crowd revisited: A threat advantage with schematic stimuli. *Journal of Personality and Social Psychology*, *3*, 381–396. doi:10.1037/0022-3514.80.3.381

Öhman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review*, *108*, 483–522. doi:10.1037/0033-295X.108.3.483

Pyszczynski, T., Greenberg, J., & Solomon, S. (1999). A dual-process model of defense against conscious and unconscious death-related thoughts: An extension of terror management theory. *Psychological Review*, *106*, 835–845. doi:10.1037/0033-295X.106.4.835

Rydell, R. J., & McConnell, A. R. (2006). Understanding implicit and explicit attitude change: A systems of reasoning analysis. *Journal of Personality and Social Psychology*, *91*, 995–1008. doi:10.1037/0022-3514.91.6.995

Schimmack, U., & Derryberry, D. E. (2005). Attentional interference effects of emotional pictures: threat, negativity, or arousal? *Emotion*, *5*, 55–56. doi:10.1037/0022-3514.91.6.995

Schwarz, N. (2007). Attitude construction: Evaluation in context. *Social Cognition*, *25*, 638–656. doi:10.1521/soco.2007.25.5.638

Smith, S. L., Wilson, B. J., Kunkel, D., Linz, D., Potter, W. J., Colvin, C., & Donnerstein, E. (1998). Violence in television programming overall: University of California, Santa Barbara study. In *National television violence study* (Vol. 3, pp. 5–220). Newbury Park, CA: Sage.