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COMMENTARIES

Perceiving Systematically, Not Just Differently: Calling for Perceptual Models With Explanatory Power

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Evidence across social psychology, vision science, health science, judgment and decision making, and affective neuroscience suggests that perception is inherently tied to social experiences. To this ever-expanding body of evidence, Y. Jenny Xiao, Géraldine Coppin, and Jay J. Van Bavel (hereafter referred to as XCVB) proffer an extensive list of perceptual (and attentional, judgmental, and memory) biases that are predicted by many factors relevant to social groups. XCVB's assemblage serves to catalog and organize relevant findings and clearly suggests that context is capable of changing perception (broadly speaking) and impacting behavioral outcomes particularly within the domain of intergroup relations.

However, any approach holds a trade-off. Within XCVB's target article, the choice to compile such a broad array of effects comes at the expense of offering a theory that is high in explanatory power. The "New Look" literature (e.g., Bruner & Goodman, 1947) and its descendants have historically been plagued with one-off, isolated studies seeking to demonstrate that social factors are capable of shifting perceptual experience. Anthologies, like this one, that stop with amassing relevant findings do not go far enough to advance the state of knowledge; the act of compiling relevant findings should serve the larger goal of building a theoretical model. A perceptual model of intergroup relations that pushes the field forward, resolves inconsistencies, increases coherence, advances novel insights and predictions, and inspires the next wave of research needs to go beyond stating that perceptual experiences between people and contexts can vary and that social group variables help to account for some of this variability. Instead, we encourage researchers, and XCVB in particular, to develop theories that propose systematic and directional shifts in perceptual experiences. Researchers must model those factors that extremitize, minimize, or foster veridicality within perceptual experience; explain *how* and *why* characteristics of a perceiver and the environment can systematically shape perception; and specify the functions served by such perceptual biases. In so doing, they will increase the precision and clarity of the model while reducing the possibility of deriving mutually contradictory conclusions from the model's assumptions; this increases the model's coherence (Trope, 2004). It is not enough to say that people perceive the world differently. We must explain how and why people perceive the world systematically.

Models relevant to the social psychology of visual perception that are capable of offering high explanatory power are being developed at present. Here we review two bodies of work to which we have contributed that are doing just that. The first body of work involves *motivated distance perception*, and a second within the domain of intergroup relations involves *motivated perception of skin tone*. These lines of work and the models that are emerging from them propose that specific visual experiences arise under prespecified conditions in order to facilitate goal-relevant responding. These models demonstrate the benefits of attempting to address how and why people vary systematically in their perceptual experiences, rather than simply stating that people do differ. Moreover, we evaluate the ability of these developing models to offer high explanatory power according to established evaluative criteria. Specifically, models with explanatory power (a) offer novel predictions; (b) can reconcile conflicting findings; (c) can be evaluated in terms of the amount of data that are consistent rather than inconsistent with the models' predictions, thereby increasing coherence; and (d) integrate narrower models (Trope, 2004). We consider the ability of two emerging perceptual models to accomplish these aims and encourage the development of perceptual models of intergroup relations to aspire to achieve these criteria as well.

A Model of Motivated Distance Perception

We begin by examining a perceptual model within social psychology that focuses on visual experiences of distance, given the centrality of distance in social experience. Indeed, perception and management of distance are required for successful navigation of interpersonal space, the satisfaction of individual attachment concerns, the restoration of feelings of social connection, and efforts to protect oneself from harm in dangerous contexts (Adolph, Berger, & Leo, 2011; Argyle & Dean, 1965; Dewitte & De Houwer, 2008; Gibson & Walk, 1960; Hall, 1968; Pitts, Wilson, & Hugenberg, 2014).

Multitudes of studies within this area support the general claim that affective or emotive targets appear at varying distances from the perceiver (see Balcetis, 2016, for a review). In response to this burgeoning body of research, we have been working to develop a theoretical framework to predict the systematic differences in visual experience of distance. This model

of distance perception adopts a taxonomic structure derived from component dimensions of affective responding (e.g., Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000; Carver, 2006). The most relevant is motivational direction, or the degree to which situations engage an impulse to approach or avoid (Carver & Scheier, 1998; Davidson, 1995; Watson, Wiese, Vaidya, & Tellegen, 1999).

Within the resulting *motivated distance perception for self-regulation* model (Balcetis, 2016), we propose that objects and situational contexts that engage approach motives in the perceiver produce visual experiences suggesting that the eliciting agent is closer, whereas objects and contexts that evoke avoidance motives in the perceiver produce experiences of the eliciting agents as farther away (Balcetis, 2016; Balcetis & Cole, 2016). By considering the motivational state that arises in response to the provoking object under specific conditions, researchers can a priori predict whether perceptions of distance contract or expand. Moreover, the manner in which perceptual experiences shift serve to encourage or withhold action, thereby serving a self-regulatory function.

Offers Novel Predictions

The model of motivated distance perception generates novel predictions, thereby offering greater explanatory power. By loosening the reliance on object construal and instead focusing on the motivational orientation of the perceiver, the model makes counterintuitive predictions. Specifically, objects, even those that are construed negatively and that produce unpleasant affective experiences, can evoke approach orientations. For example, when people encounter an imminent threat within situations that preclude escape, when resources to defend against the threat are insufficient, when defensive responses are urgent and appropriate, and when such perceptual biases may adaptively minimize the probability of experiencing, approach orientations activate as people prepare to defend against harm (Blanchard & Blanchard, 1984; Fessler, Holbrook, & Snyder, 2012; McNaughton & Corr, 2004; Nesse, 2001). Under these conditions, our model predicts that target objects should appear closer than neutral objects. Research supports this prediction. For example, in one study some women heard a man self-describe his explosive temperament while other women learned of his class schedule (Cole, Balcetis, & Dunning, 2013). Afterward, participants moved in to a small office and closed the door to spend 20 min with him alone, conditions known to activate approach behaviors as people prepare to defend against impending danger (Cesario, Plaks, Hagiwara, Navarrete, & Higgins, 2010). Despite the fact that the participants did not like the man with anger management issues and felt scared of him, these women estimated that he appeared 26% closer than the man who presented himself as a normal college student.

Similarly and perhaps counterintuitively, avoidance orientations can arise in the presence of hedonically pleasant objects, and in particular ones that conflict with central goals; these objects are often identified as temptations. People construe some temptations as positive in the here and now, yet demonstrate behavioral avoidance of them, and perceive them as farther away than neutral objects. Indeed, dieters were faster to respond to temptation-related words, like *chocolate* and *butter*, than goal-related, like *slim* or *muscles*, or neutral words by making a pushing motion indicative of the activation of avoidance (Fishbach & Shah, 2006).

This model of distance perception that considers not just the properties of the object but also the underlying motivational state of the perceiver generates novel predictions not borne out by any other more basic investigation of perceptual differences. Moreover, these testable predictions have been supported by recent studies, thereby increasing the explanatory power of the model relative to alternatives.

Improves Coherence

The model of motivated distance perception offers greater coherence. If only considering the valenced or emotive properties of the object, it may seem contradictory that objects of opposing qualities should exert the same impact on perceptual shifts. For example, desirable objects including water, money, gift cards, and favorable feedback appear closer than neutral, control objects (Balcetis & Dunning, 2010; Valdés-Conroy, Román, Hinojosa, & Shorkey, 2012). At the same time, the more a spider is construed as a threat, the closer it appears (Cole et al., 2013). One may wonder about the falsifiability of the model and ability to generate predictions that are free of mutually contradictory conclusions, given that both desirable and threatening objects appear closer than neutral objects. However, when considering motivational orientation of the perceiver rather than construal of the objects, such contradictions within the literature resolve, as both the desirable and threatening targets that evoke strong approach orientations are perceived as close.

Reconciles Inconsistencies

The model also reconciles a number of seeming inconsistencies in the literature. As one example, the literature finds that disgusting objects appeared farther away in some instances (Cole et al., 2013, Study 1; Siegel, Walker, & Stefanucci, 2009) but equidistant to neutral objects in other instances (Cole et al., 2013, Study 2). For example, a disgusting man who revealed he had urinated into customers' beverages while working at a fast-food restaurant appeared equally as far from participants as did a mundane man who described his class schedule (Cole et al., 2013). As a second example, results suggest that distances are perceptually represented as longer in some instances (Mattson & Rengert, 1995) and shorter in others (Cesario & Navarrete, 2014; Cole, Balcetis, & Dunning, 2013; Xiao & Van Bavel, 2012).

Our model reconciles these apparent discrepancies by considering the motivational state of the perceiver within the specific testing conditions each paradigm employees. Desired objects selected as targets within this literature evoke approach orientations, and so too do the selected threatening targets (see Balcetis, 2016, for a review). Consistent with the tenet of the theory of motivated distance perception claiming that approach motives produce perceived proximity, both desired and threatening objects consistently appear closer than neutral objects within this body of work. Similarly, consistent with the tenet of the theory of

motivated distance perception that avoidance motives produce perceived extremity, disgusting objects that people are motivated to avoid consistently appear farther away. In addition, some situational contexts can activate both approach and avoidance orientations concurrently (e.g., Gable, 2006), as was likely the case when women completed a study on social interactions where they believed their ability to converse with a man was being tested (which may have elicited approach) while feeling disgusted by the fact that he urinates into food (which may have elicited avoidance). The simultaneous activation of both orientations may have counteracted any effect on distance perception minimizing the occurrence of any perceptual bias. Inconsistencies can be resolved by considering underlying motivational orientations that arise as a function of different social and situational contexts.

Integrates Narrower Models

This model of motivated distance perception builds on, and in so doing refutes, narrower models of distance perception, including ones that predict distance perception from valence, motivational intensity, or arousal. First, valence does not serve as an apt organizing principle for motivated distance perception, as valence cannot consistently predict whether affective objects will appear closer or farther; indeed, both positive and negative objects appear closer than control objects (Balcetis & Dunning, 2010; Cole et al., 2013; Valdés-Conroy et al., 2012).

Similarly, the intensity of the perceiver's experienced motivational state (e.g., Atkinson, 1957; Elliot, 2006; Hull, 1943) cannot predict perceptual bias. Motivational intensity does not consistently predict the direction of perceptual shifts, nor are differences in intensity necessary for changes in perceptions of distance to occur. Object that elicit high motivational intensity appear closer than objects that evoke weak intensity (Balcetis & Dunning, 2010). But greater intensity does not always predict increased perceptions of proximity (Cole et al., 2013; Siegel et al., 2009). Reciprocally, perceptions biases can emerge despite similarly intense motivational responses (Cole et al., 2013, Study 2).

Finally, perceivers' arousal, a construct independent of motivational intensity (Gable & Harmon-Jones, 2010), cannot predict perceptions of distance. For instance, participants reported feeling more energized and worked up in response to one target and perceived that target as closer than another target that did not evoke feelings of arousal (Cole & Balcetis, 2013). However, in a separate line of work, arousal predicted perceived extremity; anxious golfers perceived the hole as farther away compared to golfers who effectively downregulated their arousal (Stern, Cole, Gollwitzer, Oettingen, & Balcetis, 2013). Moreover, arousal is not sufficient to change distance perception. Some police officers experienced increased heart rate during a simulated altercation, whereas others' heart rates remained relatively low; however, perceptions of distance to the suspect did not differ between the groups (Nieuwenhuys, Canal-Bruland, & Oudejans, 2012). The theory of motivated distance perception that makes predictions based off of motivational orientation is able to refute narrower models and thus gain greater explanatory power.

Summary

The motivated distance perception model offers novel and coherent predictions. These generated data can be used to support or refute the predictions generated from the model, and in general it seems that the model is supported. Moreover, the model reconciles inconsistencies inherent in the literature and builds upon narrower models that predicted effects from valence, motivational intensity, or arousal. In so doing, the motivated distance perception model offers significant explanatory power and has the potential to advance the next generation of research in this area.

A Model of Motivated Skin Tone Perception

Next, we focus on a model of perceptual representation specifically within the domain of intergroup relations—one that focuses on perceptions of skin tone. One of the first characteristics that people perceive when meeting other people is their skin tone. A large body of research in psychology indicates that people use skin tone as a basis for attributions about others (see Maddox, 2004, for a review). Overall, findings seem to suggest that people make positive inferences about people who possess lighter skin (Maddox, 2004; Nosek et al., 2007), regardless of the person's racial category membership (Blair, Judd, & Chapleau, 2004). The perceived social meaning of skin tone holds implications for large-scale judgments and decisions. For example, people with darker skin receive harsher criminal punishments (Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006) and are more likely to be shot when unarmed (Ma & Correll, 2011).

Given the primacy of skin tone in social judgments, an important and unexplored area of inquiry concerns whether there are situational and motivational factors that impact initial perception of skin tone. In other words, when looking at the same target, do all people form the same perceptual representation of the target's skin tone? One important factor that appears to modulate the role of skin tone in social judgment is a perceiver's own race. However, the current state of the literature provides mixed findings regarding how Whites and Blacks mentally represent the visual features of lighter and darker skin tone, and in turn does not allow for clear predictions of how people would construct perceptual representations of others' skin tone. Some findings suggest that both Black and White Americans associate lighter skin with positivity; Black and White adults ascribe positive characteristics to people with lighter (vs. darker) skin tone (Maddox & Gray, 2002), and Black children indicate that they would prefer to play with a lighter (vs. darker) skinned doll (Clark & Clark, 1950). Other findings suggest that Black Americans do not differentially associate lighter and darker skin with positivity; White Americans show an implicit preference for lighter skinned people, whereas Black Americans do not (Jost, Banaji, & Nosek, 2004; Nosek et al., 2007). Last, some findings suggest that Black Americans associate darker skin with positivity; Black adults express a greater preference for organizations that employ people with darker (vs. lighter) skin tones, whereas White adults do not (Kahn, Unzueta, Davies, Alston, & Lee, 2015). Although findings seem to consistently indicate that White Americans use lighter skin

as a cue for positive attributes and behaviors, findings generated among Black Americans provide a much more inconsistent story.

Given the mixed and seemingly inconsistent nature of skin tone representations, we sought to develop a theoretical framework that would allow for the development of novel predictions concerning how Whites and Blacks would perceptually represent others' skin tone across different contexts. Moreover, in reconciling seeming inconsistencies in the literature, we also explored the context dependence of specific patterns of perceptual representational bias, explored moderators, and examined the combined effect of different variables in more complex research designs, all of which help to increase the explanatory power of an emerging model (Ellemers, 2013).

To develop this framework, we turned to dominant theories in intergroup relations. There are two fundamental motivations that heavily impact the way that people make judgments and decisions in intergroup domains and that we posited would impact perceptual representations of skin tone. Social identity theory argues that people are motivated to act in ways that enhance the social standing of their group, such as through demonstrating ingroup favoritism in the allocation of monetary resources and ascribing more positive characteristics to their ingroup than their outgroup (Tajfel & Turner, 1979). In contrast, system justification theory argues that people are motivated to defend, bolster, and legitimize the status quo, such as through supporting social hierarchies and showing preference for higher status groups (Jost & Banaji, 1994; Jost, Banaji, & Nosek, 2004). We reasoned that people might perceptually represent others' skin tone in a manner that supports these motivations. In turn, understanding how these motivations guide social judgments across different contexts could help resolve inconsistencies in the literature.

For members of high-status groups, motivations to enhance one's group and defend the status quo typically converge. For example, a White American who shows preference for other Whites in hiring and promotion practices shows preference for their group and supports a societal status quo in which Whites occupy positions of power and leadership. In turn, we reasoned that for members of high-status groups, their motivations to defend their group and the status quo would shape the way that they perceptually represent people's skin tone in a similar manner. In contrast, for members of low-status groups, motivations to enhance one's groups and legitimize the status quo often diverge (Jost, Pelham, Sheldon, & Ni Sullivan, 2003). For example, a Black American who shows preference for other Blacks in hiring and promotion practices enhances the social standing of their group but challenges the status quo.

Because these motivations clash for members of low-status and marginalized groups, the extent to which each motive impacts perceptual representations of skin tone likely depends on which motivation is prioritized in that situation. Based on recent findings and theoretical developments (e.g., Kay & Friesen, 2011; Kay et al., 2009), we proposed that the motive to defend the status quo would guide social judgments when the system is threatened (e.g., when it is unstable or strongly criticized), whereas the motive to defend one's group would guide judgments when the system is not threatened or is reaffirmed as legitimate (e.g., when it is described as well functioning).

Overall, this theoretical backdrop allows for the development of two directional predictions that work to reconcile inconsistencies in the literature concerning when and why Whites and Blacks would link lighter and darker skin to positive attributes and offers novel predictions for representational bias not offered by alternative models. Our framework predicts that when the system is *stable*, Whites will perceptually represent someone with positive attributes as possessing *lighter* skin, whereas Blacks will perceptually represent someone with positive attributes as possessing *darker* skin, as doing so would enhance the standing of their group. Our framework also predicts that when the system is *unstable*, both Whites and Blacks will perceptually represent someone with positive attributes as possessing *lighter* skin, as doing so would support the status quo.

Recent findings from our lab support these predictions. In one study, a sample of primarily White participants viewed two grainy videos, one in which a man committed a highly negative act (running down an elderly pedestrian with his car) and the other in which a man committed a highly positive act (returning a missing wallet containing $1,200 to a local charity). Overall, participants perceived the man who committed the highly negative (vs. positive) act as having darker (vs. lighter) skin (Alter, Stern, Granot, & Balcetis, in press). It is important that White participants who expressed attitudes consistent with wanting Black Americans to maintain a low-status position were especially likely to assume that immoral acts were committed by a darker skinned man, suggesting that participants' perceptual representations were functioning in the service of their motivations.

In separate lines of research, we tested our full model by including both White and Black participants in our sample and manipulating system threat through altering the presumed stability of the U.S. government. People view their own political attitudes as positive attributes (e.g., Brandt, Reyna, Chambers, Crawford, & Wetherell, 2014), and so we manipulated the positivity of a person's attributes through informing participants that they either did or did not share the attitudes of a highly competent political candidate. We found that when no information about the system was provided or the governmental system was presented as stable, Whites who agreed (vs. disagreed) with a candidate represented his skin tone as *lighter*, whereas Blacks who agreed (vs. disagreed) with a candidate represented his skin tone as *darker* (Caruso, Mead, & Balcetis, 2009; Stern, Balcetis, Cole, West, & Caruso, 2016). In contrast, when the governmental system was presented as unstable, *both* Whites and Blacks who agreed (vs. disagreed) with a candidate represented his skin tone *lighter* skin. Overall, skin tone representations supported the motivation to enhance the social standing of one's group when the system was stable, and they supported the motivation to defend and legitimize the status quo when the system was unstable.

Our theoretical framework concerning how people perceptually represent skin tone meets criteria for holding high explanatory power (Trope, 2004). First, it reconciles inconsistent findings. Whereas the current state of the literature provided a very mixed view of when and why White and Black Americans would represent lighter and darker skin as being

associated with positive attributes, our framework helps to resolve these inconsistencies by specifying conditions under which particular outcomes are expected to occur. Second, we make novel predictions that would not emerge from any other framework, such as that Blacks will perceptually represent a highly qualified political candidate with positive attributes as being darker skinned only when the system is stable. Third, our theoretical framework makes directional predictions and in turn is falsifiable. We do not simply state that group membership and situational factors lead people to perceive members of one's own and another group differently. Instead, our framework makes clear predictions about when and how these factors will systematically shape perceptual representations.

Finally, we integrate and expand upon narrower models. Through specifying conditions under which motivations to enhance one's group and defend the status quo guide social judgment, we move beyond narrow questions of *which* motive guides judgments and instead suggest *when* each of these motives will differentially guide judgments. In addition, although we developed this theoretical framework in the context of how people represent skin tone, our perspective is in no way constrained to that domain. The broad and nuanced nature of our framework can be used to make predictions about how members of high- and low-status groups in any social category (e.g., gender, sexual orientation, religion) will represent people on an attribute. For example, both men and women in leadership positions typically possess more masculine characteristics (e.g., Rudman, Moss-Racusin, Phelan, & Nauts, 2012). As such, based on our theoretical framework we would predict that motivations to enhance one's group and defend the status quo would lead men and women to differentially represent the gendered characteristics that a highly qualified female candidate or CEO would possess. Overall, our theoretical framework articulates how and why people would systematically differ in the way they perceive attributes across social contexts and group memberships and allows for the development of unique and generative predictions in intergroup perception research.

Conclusion

The substantial body of research summarized by XCVB exemplifies the excitement and interest that scientists across disciplines hold in understanding how goals and motivations (whether chronic or situationally induced) guide the way that people perceive their social landscape. Despite the emergence of an exponentially growing literature on motivated perception and XCVB's laudable review of this literature, we feel that this area of inquiry currently lacks strong models that wield explanatory power. In this commentary, we outlined two working theoretical models that hold explanatory power and seek to systematically account for how contextual and motivation factors modulate perceptual experiences. We hope that other researchers, including XCVB, will continue the charge in synthesizing the current state of the literature and developing comprehensive models that detail the complex contours of motivated perception in intergroup domains.

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