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Back to the Future: How Today's Neurocognitive Techniques Substantiate Predictions Made 50 Years Ago

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In this issue, Y. Jenny Xiao, Géraldine Coppin, and Jay Van Bavel propose "a perceptual model of intergroup relations." Their contribution reviews empirical evidence to demonstrate the power of social relations in shaping the way people perceive and interpret "objective" features of reality (Xiao, Coppin, & Van Bavel, this issue). The target article connects social psychological theory with neurocognitive research on perception. The main argument and model that Xiao et al. propose specifies that (a) "top-down" processes affect sensory perception; (b) group membership (self-categorization, collective identity, social context) impacts upon visual, auditory, olfactory, tactile, and gustatory perception; and (c) this mediates attitudes, judgments, and behaviors relevant to intergroup relations. Xiao et al. present empirical evidence in support of this argument.

Theirs is an important contribution to the literature. We all learn in 1st-year psychology classes that people are bounded rationalists with limited attentional and cognitive abilities. As a result, in principle we know that we are unable to "objectively" perceive our physical and surroundings and that we are subject to all manner of illusions and biases. Yet as scientific researchers and professional psychologists, we tend to ignore this. Instead, we often pretend that we can and do make objective assessments of the physical properties of stimuli and assume that everyone agrees about the social implications of specific situations. Yet this is a fallacy.

The failure to acknowledge contextual influences that can bias human perception has been noted as a problem that stands in the way of knowledge accumulation. For instance, when researchers ignore contextual differences in designing empirical studies, this may impact the reproducibility and generalizability of scientific findings (Does et al., 2016; Van Bavel, Mende-Sied-lecki, Brady, & Reinero, 2016). Some may argue that such situational features and their impact on perception are rightly ignored because they are just random "noise." Because it seems impossible to take into account *all* situational aspects that might affect people's perceptions (ranging from time of day, temperature and light in the room, position of the chair, color of the display, or size of the computer screen), they prefer to not to address such factors altogether. The contribution by Xiao et al. convincingly argues that social categorizations and group identities are different because they influence human perception in a systematic, predictable, and significant way. Hence, this influence should not be ignored.

Ideas Developed 50 Years Ago

The target article brings us full circle. Noting that (social) categorizations inform (visual) perception of lines, coins, and individuals is the root of the development of social identity theory. Social identity theory and self-categorization theory (together representing "the social identity approach") specify that groups and social categories help people make sense of their surroundings and find meaning in the physical and social information to which they are exposed (Tajfel, 1974; 1978a; 1978b; Tajfel & Turner, 1979; Turner, 1985; see also Ellemers, 2010; Ellemers & Haslam, 2011).

Xiao et al. (this issue) suggest that prior work "has been surprisingly silent on the *perceptual processes* that mediate the relationship between social identity and behavior" (p. 256). Yet social identity theory (Tajfel & Turner, 1979) was developed to do just that. It aims to offer an "integrative" theory, meaning that its ambition is to connect cognitive (thought) processes and (behavioral) motivation (Ellemers, 2012). From the outset, both the development of the theory (Tajfel, 1969; 1978a; 1978b) and the research it inspired very clearly reflected this (Tajfel & Wilkes, 1963). In fact, the notion that social categories and social identities impact *perception* goes back to the late 1950s and early 1960s, when Tajfel first developed his ideas about relations between social groups (Tajfel, 1957, 1959). In his writings he explicitly drew a direct relation between categorization in visual perception and intergroup relations. It is no coincidence that his 1969 publication is titled "Cognitive Aspects of Prejudice."

Starting with his very early publications (1957, 1959) Henri Tajfel addressed the way social variables might influence perceptions of object size, weight, and color, and he indicated that physical properties of attributes are perceived differently when an emotionally meaningful classification is superimposed on them. Going beyond the anchoring effects that had already been documented, he specifically focused on the perception of similarities versus differences in series of stimuli, as he thought this most relevant to the relations within and between groups he sought to understand.

Tajfel built his predictions on prior work on the perception of physical stimuli, such as the studies revealing that the perception of coin sizes depends on their monetary value, whereas this was not the case for identically sized metal or cardboard

disks (Bruner, 1957). However, in developing his ideas he also referred to early studies demonstrating how social identities affect the perception of faces and physical properties of others. For instance, in his 1959 publication he cited a study by Secord, Bevan, and Katz (1956), showing that prejudice enhances perceived differences in skin color of Whites versus "negroes" (Tajfel, 1959, p. 19). Tajfel also referred to a study by Razran (1950) demonstrating that people perceive the attractiveness of the same faces differently, depending on whether these are displayed with or without an ethnic label.

Likewise, John Turner, who extended Tajfel's early thinking (Tajfel & Turner, 1979) to include self-categorization processes (Turner, 1985), explicitly connected to the work of Rosch (1978) on object categorization to develop his self-categorization theory. In his writings, he noted that cognition is *always* shaped by the social context in which it takes place (Turner, 1985; Turner, Oakes, Haslam, & McGarty, 1994). In fact, in the introduction to the virtual special issue that was edited after he passed away in July 2011, his former students noted that John Turner's vision was "to explain the distinctly social nature of the human mind" (Haslam, Reicher, & Reynolds, 2012).

In his work, Turner emphasized the context-sensitivity of categorization processes. This implies that social categorizations and identities make people perceive themselves as either similar to others (categorizing them as ingroup members) or different from them (as outgroup members)—*not* the reverse, even though it is often erroneously inferred that perceived similarities and differences between individuals should be decisive in determining ingroup versus outgroup categorizations.

The Minimal Group Paradigm is based on this very notion: Random individuals are perceived and treated differently depending on whether they are presented as ingroup or outgroup members (Tajfel, Billig, Bundy, & Flament, 1971). However, many found it hard to believe that subjective social beliefs might influence perceptions of objective person features and behaviors toward them in this way. Thus, countless studies were done to examine all manner of alternative explanations. Nevertheless, over the years it became clear that category-based perceptual differences cannot be attributed to interpersonal similarity, liking, need for high self-esteem, or interdependence (e.g., Diehl, 1990; Hogg & Abrams, 1990; Mummendey & Schreiber 1983; Rabbie, Schot, & Visser, 1989; Tajfel & Billig, 1974; see also Ellemers & Haslam, 2011; Haslam, Ellemers, Reicher, Reynolds, & Schmitt, 2010). Instead, the process of categorization in itself changed the way people perceived themselves and others.

New Data

An important function of the review put together by Xiao et al. is that it again brings all these issues to our attention and connects them to new evidence obtained with neuroscientific methodologies. If such fMRI and EEG methodologies had been available 50 years ago, Henri Tajfel and John Turner would have been thrilled. This might have saved them from spending decades to combat disbelief about the possibility that relatively minimal and meaningless social categorizations could actually impact social perceptions and intergroup relations. Yet the model developed by Xiao et al. relies on much of the early work

that also inspired social identity theory. Even though this work was published in the 1940s, 1950s, and 1960s, it is now cited as primary evidence for the "new" model presented by Xiao et al. (this issue).

The target article does well to remind readers of these early studies that inspired similar ideas long ago. Combining this early work with more recent studies using more sophisticated neuroscientific methods offers more convincing and quite conclusive evidence that subjective and motivational processes relating to self and identity shape the way we perceive the world around us. Hopefully readers of the target article will also be inspired to go back to the theoretical arguments that were developed so long ago. In fact, the original writings of Tajfel and Turner on this topic were reprinted not long ago because they still offer a quite powerful analysis of many social processes that is still valid in the light of new evidence and today's knowledge (Postmes & Branscombe, 2010).

Connecting to this literature might also resolve an important concern expressed by Xiao et al., when they write that "the central premise of our model is that social identification influences perception. This notion has not been studied much in social psychology, until recently" (p. 257). It might be helpful to know that—in the context of social identity theory—much research has been done to examine just that. This work has shown, for instance, that social categorizations and group identities impact on the perceived variability of individuals who belong to the same category. Outgroup homogeneity as well as ingroup homogeneity effects can occur and have been documented to emerge depending on the social meaning of the situation and the groups it contains (for overviews, see Doosje, Spears, Ellemers, & Koomen, 1999; Spears, Ellemers, & Doosje, 1999). Likewise, there is a substantial body of research demonstrating the effects of social identification and identity-based needs on the way differences between groups of people are perceived. Intergroup differences are either exaggerated or neglected, depending on the social identity needs of the groups and their members (e.g., Jetten & Spears, 2003).

Defining Perception

A major issue running through the argument proposed by Xiao et al.—and addressed by the authors at several points—touches a classic debate again (see also Oakes, Haslam, & Turner, 1994; Spears, Oakes, Ellemers, & Haslam, 1997). Xiao et al. note that the impact and implications of the proposed model are likely to differ, depending on how "perception" is defined and measured. The authors opt for a relatively loose and broad definition of perception, which includes judgment, recall, and attention. Broadening the term "perception" in this way enables them to encompass the different studies reviewed here. It also clarifies how different cognitive processes are interrelated and can work together to explain social behavior.

The downside might be that this may be seen to reduce the implications of the model in the eyes of critics who consider perception as a separate process that should be distinguished from more broad considerations indicating subjective interpretation of one's surroundings. Another disadvantage of taking such a broad view is that readers may consider the evidence presented less novel and convincing, as the empirical evidence

lies further away from "true" or "basic" perception. Nevertheless, the broad conceptualization chosen here sits well with current insights on neurocognition, which have been moving toward the examination of how different processes and parts of the brain work together in systems and networks, instead of isolating specific functions or locations.

Presentation of Evidence

As Xiao et al. also indicate, the evidence in the studies they review is unbalanced. No doubt this reflects the situation in the literature. Nevertheless, it does imply that the work regarding "visual" perceptions comprises the majority of the evidence presented. Research on the other perceptual modalities—which would be more novel—is lacking or limited to isolated studies that do not always capture the key elements of the proposed model. Some studies presented simply show that there is an impact of "social context" or "top-down" processes, not that this relates to social categorization or group-related concerns.

The authors further note that "there is much more research on the path of the model leading from social identity to perception than from perception to intergroup relations" (p. 257). Fortunately, this gap might be filled by considering evidence that is available in domains not considered in the target article. For instance, there is a body of work on language use and language perception examining how social identities impact the words people choose to verbalize their observations to themselves or to communicate these to others. Subtle linguistic biases that emerge due to social categorizations (e.g., choosing an adjective or a verb to describe the same behavior) imply slightly different perceptions that can nevertheless have far-reaching effects for the resulting impressions and behaviors (for an overview, see Maass, 1999). Likewise, work on embodiment, mimicry, and motor resonance (e.g., Gutsell & Inzlicht, 2013) might be relevant. Some of the clinical applications that are cited as important outcomes by Xiao et al. might benefit from considering such evidence. Future work might also consider the implications of the evidence presented in the target article and elsewhere for eyewitness testimony, where human perceptions are accepted as evidence in legal cases (e.g., Borgida & Fiske, 2008).

During the past years, efforts to connect neuroscientific evidence indicating perceptual differences to intergroup relations have increased considerably. For instance, a recent volume brings together results from different programs of research that reveal the neurocognitive underpinnings of intergroup perceptions and how these relate to prejudice in intergroup relations (Derks, Scheepers, & Ellemers, 2013; see also Ellemers, Van Nunspeet, & Scheepers, 2013; Scheepers, Ellemers, & Derks, 2013; Van Nunspeet, Derks, Ellemers, & Nieuwenhuis, 2015). Other programs of research that were not considered by Xiao et al. might further inspire future research on the processes connecting identity, perception, and intergroup relations. We know, for instance, that imagined properties of outgroup members can cause them to be perceived as less than human, and this is visible in fMRI responses (Harris & Fiske, 2006). However, such ingroup bias can be reduced by recategorizing former ingroup and outgroup members in a single overarching category (e.g., Gaertner, Dovidio, & Anastasio, 1993). Research has also established that the mental simulation of positive outgroup perceptions in imaginary contact can reduce prejudice (e.g., Crisp & Turner, 2009; Miles & Crisp, 2014). These are all highly exciting insights and extremely important developments. Connecting these different research programs, and relating them to a single unifying theoretical framework, would facilitate theoretical progress and can inform applications of scientific insights on human perception to improve intergroup relations in society (Ellemers, 2013).

Conclusion

The main conclusion from the contribution by Xiao et al. (this issue) is that perception should not be seen as a passive reception of properties that are "out there." Instead, it is the result of an (inter)active process of meaning seeking, in which social relations and group memberships in particular play a key role. This is an important message, even if it is something many people have been arguing for many years. The main innovation of Xiao et al.'s contribution—that promises to bring home its message more convincingly than before—is that during the past years evidence for this position has become available in the form of neurocognitive indicators of perception. Xiao et al. have played an important role in conducting such research and collecting and making available this knowledge. The current ability to demonstrate that social categorizations and group memberships literally change processes that occur in the brain may help convince those who think human perception is governed by basic cognitive functions and universal mechanisms.

It is by now an established fact that people "fill in the gaps" in processes of perception by relying on the so-called "top-down" processes to which Xiao et al. refer. Social categorization triggers a motivated form of meaning seeking that affects cognitive processing of information that in turn informs behavior. In the context of social identity theory, a lot of work has been done to demonstrate the symbolic nature and value of social categorization and identification processes, which are distinct from interpersonal similarity, liking, or interdependence. Even if the model Xiao et al. propose is not novel in this sense, their review might inspire additional research using novel techniques to examine the different perceptual modalities that may impact upon people's attitudes and behaviors—even if this happens outside their awareness. This is an important contribution in that it once more emphasizes the link between "cognitive" and "motivational" processes and reminds us that basic human functions are socially adaptive and not hardwired.

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