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III

A New Look at Person Construal: Seeing Beyond Dominance and Discreteness

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The richest and most elaborate affordances of the environment are provided by other animals and, for us, other people. (J. J. Gibson, 1979/1986, p. 135)

In the ecological approach to visual perception, J. J. Gibson redefined visual perception in reciprocal terms, an important departure from the theories of the time. The visual perception of objects, he argued, is bound to the objects' inherent affordances, or the interaction possibilities between the perceiver and the object of perception (Gibson, 1979/1986). Gibson's functional perspective had, and continues to have, a sweeping impact on theories of visual perception. Yet with a few notable exceptions (e.g., McArthur & Baron, 1983; Zebrowitz & Collins, 1997), rarely have researchers considered how social affordances fundamentally change the perceptual process, a notion to which Gibson alluded but about which little progress has been made. To be sure, objects of perception that afford social interaction (i.e., other people) are likely to be among the most important targets to be visually perceived. By this reckoning, few perceptual tasks are as critically important as the mandate to perceive the characteristics and identities of others from the extant visual cues availed to the perceiver. It is these very percepts that implicate the likely course of interpersonal interaction. Social perception, or person construal, may therefore be characterized as an index of social affordance insofar as the early perception of person characteristics has a profound and lasting impact on subsequent attitudes, judgments, and interactions (McArthur & Baron, 1983).

Given this importance, it is unsurprising that a considerable amount of research has focused on the task of perceiving others. Until recently, however, social psychological research investigating "person perception" has focused almost exclusively on observers' ability to discern traits and dispositions from written behavioral descriptions. The application of ecological theory to person perception has had a similar focus — the perception of traits with an emphasis on the downstream consequences thereof. While the perception of other people's traits is

undeniably important, perceiving others routinely begins by processing visual cues to identity and thus involves lower-level *visual* perception. Theoretical and empirical work examining the boundary between low-level visual processes and higher-level interpersonal dynamics began only recently. Moreover, the recognition that social factors may contextualize the visual perception of cues to identity is scarcely mentioned in existing literature.

In this chapter we will explore how social categories and the cues that convey them contextualize the visual processing of others, affecting not only the ultimate perception but also the process by which that percept is achieved. First, we will situate person construal within a broader perceptual framework and argue that social categories and visual cues serve as contextual information for visual perception. (We will use the term “person construal” to refer to the visual perception of other people. This phrase distinguishes our meaning from the more commonly used “person perception,” which is typically used in reference to perceiving traits and dispositions.) Then we will review evidence that challenges two implicit but prevalent assumptions regarding the nature of person construal – dominance (i.e., that when perceiving individuals, one identity must dominate perception, such as race winning over sex) and discreteness (i.e., that social categories are ultimately perceived in a binary, all or nothing, fashion). Instead, we will argue that person construal is best characterized as a continuous process in which the representation of social category membership is continuously updated in real time. From this perspective, person construal never fully achieves discrete representation of social categories in working memory, but rather manifests in a dynamic probabilistic manner.

PUTTING CONTEXT IN CONTEXT

To say that context affects visual perception is not a controversial statement. Indeed, vision scholars have long understood that the immediate context surrounding one’s visual focus dramatically alters the perception of the focal stimulus. Many classic visual illusions emerge precisely because of the impact of visual context, often the space immediately surrounding the object of perception, having an inexorable effect on basic visual perception. Consequently, perception is swayed even when an observer is fully aware of the biasing impact that context is exerting. The Ebbinghaus (or Titchener) illusion is a perfect example. In spite of the fact that the center circles are identical in Figure 11.1, the perception of relative size is irrevocably influenced by the surrounding context. When it comes to visual perception, context matters.

Such effects extend far beyond the perception of physical parameters, and instead recruit prior knowledge to sway perception. Take the words appearing in Figure 11.2a, for example. When one focuses on the ambiguous middle letter in isolation from the first and last letters, it is readily apparent that the two are identical. Yet when viewing each letter within the context of a word, the inclusion of the lexical context effortlessly transforms the ambiguous letter into an “H” to complete the word “THE,” but into an “A” to complete the word “CAT” (see also

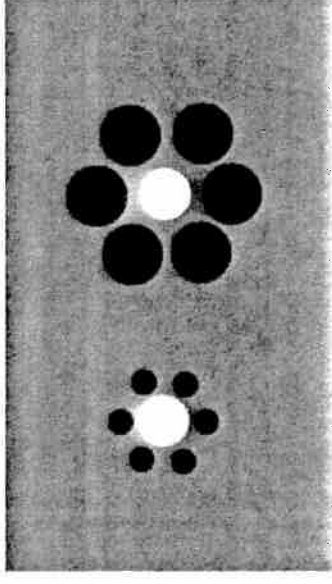


FIGURE 11.1 The Ebbinghaus illusion: The black circles surrounding the center white circle exert an inexorable effect on observers’ perception of the size of the white circle, even though the two white circles are identical.

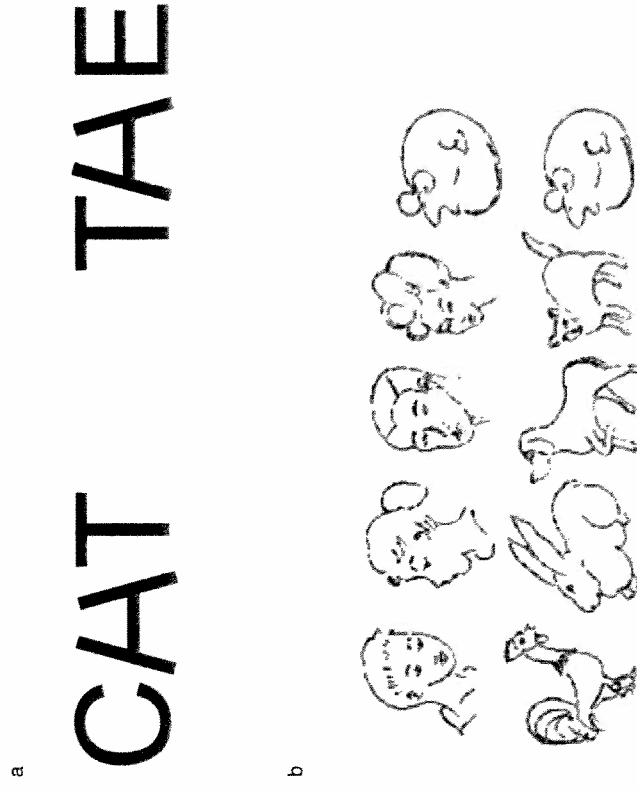


FIGURE 11.2 Ambiguous figures: (a) The lexical context in each word leads to a different interpretation of the middle character (described in Spivey, 2007). (b) The conceptual context in each row leads to a different interpretation of the final picture (from Bugelski & Alampay (1961), copyright 1961, Canadian Psychological Association; permission granted for use of material).

Spivey, 2007). In a seminal study, Bugelski and Alampay (1961) demonstrated that conceptual context can similarly affect visual perception. When an ambiguous figure such as the final image in Figure 2b was presented within the context of human faces, it was more likely to be interpreted as a bald man; when the same figure was presented within the context of other animals, in contrast, the same figure was more likely to be interpreted as a rat (see also Lassiter & Geers, 2005 and Chapters 4 and 10 in this volume for a more comprehensive discussion of these and similar effects). Thus, the notion that contextual information, be it physical or conceptual, can affect visual perception summons widespread support throughout the vision and cognitive science community.

Unlike the widespread embrace of the effect of context on the visual perception and interpretation of objects, the notion that *social* context can exert an analogous impact and fundamentally alter low-level aspects of visual perception provokes much skepticism. In fact, such notions have received a lukewarm reception, at best. Before describing some of the early studies that support just this sort of contextual modulation, it is instructive to consider what exactly constitutes social context. From a Gibsonian perspective, social context may be thought of as any extraneous information about a social target within the visual field. This perspective holds that, although inherently extraneous, such information can nevertheless guide basic perception because it has interpersonal or functional relevance. Social context may therefore include things such as social category information (i.e., one's sex, race, or age), perceptual cues that are diagnostic of a social category (e.g., sexually dimorphic cues in the face or body), or even the mere presence of a person. Any of these forms of social context may influence the perception of social and nonsocial stimuli alike.

For instance, evidence is accumulating that social context plays an important role in the perception of basic physical events. Shiffrar and her colleagues (Shiffrar, Kaiser, & Chouhroulou, in press), for example, have found that the presence of a person, as opposed to an object, can alter how, or even whether, biological motion is perceived. These effects are found in studies of the perception of apparent motion, the perceptual phenomenon in which the successive presentation of static images gives rise to the perception of smooth motion. This is the foundation for the appreciation of motion in films and flip books. When seen in rapid succession, a series of static pictures is perceived as dynamic motion.

As it turns out, not all apparent motion displays are created equal. In their studies, Shiffrar and her colleagues asked participants to judge the motion qualities (e.g., integrity or smoothness) of apparent motion displays in which two static images were separated by a fixed amount of time. Participants evaluated each sequence for the perception of motion and the quality (e.g., how smooth?). Predictably, the length of delay between the images powerfully influenced motion perception (replicating many prior studies). More interestingly, motion perception varied as a function of social context. When a motion, such as a punch, was directed toward a person, observers perceived the sequence "in motion"; when the motion was directed toward a non-human object such as a refrigerator, in contrast, observers did not. These data suggest that one form of social context – the presence of a person as the recipient of an action – altered low-level processing in the

perceptual system (i.e., motion perception) and induced observers to perceive motion when, in fact, none actually existed.

Similar work has highlighted pronounced sensitivity for observers to detect coherent human motion, even under challenging visual conditions. These studies rely heavily on the well-documented ability of observers to perceive human motion even in the most impoverished of displays. In a seminal set of studies, Johansson (1973, 1976) described a now widely used technique in which recordings were made of individuals engaged in various activities. Reflective material was affixed to the major joints of a target's body prior to filming so that when the films were replayed under altered illumination and contrast, only points of light were visible. This technique fully isolated the motion of the body. Observers of point-light displays can readily discern a range of social categories including sex category membership (Kozlowski & Cutting, 1997; Pollick, Kay, Heim, & Stringer, 2005), identity (Cutting & Kozlowski, 1976), behavioral intent (Rumeson & Frykholm, 1981), and even emotion state (Pollick, Paterson, Bruderlin, & Sanford, 2001). These results and others highlight a strong visual sensitivity to infer interpersonal factors through the perception of human motion.

As it turns out, visual sensitivity to specific types of human motion can powerfully alter other aspects of visual perception. Observers of point-light displays, for example, are highly likely to accurately encode the emotion state of a display (Pollick et al., 2001), at times doing so without intent (de Gelder & Hadjikhani, 2006). The incidental perception of some emotions enhances observers' ability to detect human motion presented within a visual mask of other moving lights (Chouhroulou, Matsuka, Harber, & Shiffrar, 2006). In such tasks, participants' task is merely to determine whether a person is present or absent in a display that includes a "mask." Point-light walkers that moved with angry body motions were readily detected in the haze of moving lights (the mask). Point-light walkers that embodied different emotional states, however, were not. Arguably, these differences may be due to social affordances. The nature of potential interactions with another person varies with the target's emotion state. This makes the perception of some emotions, such as anger, more consequential. The social context of anger heightened perceptual sensitivity because of its interpersonal and functional relevance. Put simply, the visual perception of human motion is coupled to the functional importance of its perception.

In these examples, social context altered low-level aspects of visual perception. They highlight the critical role that social context plays in the basic perception of others. Findings from both neuroscience of vision and social cognitive modulation of perception provide evidence of how the neural subsystems underlying perception and cognition might collaborate to produce effects of social context on lower level perceptual judgments. The perception of human motion, for example, generally corresponds to increased activity in specific brain regions (e.g., posterior regions of the superior temporal sulcus, STS; Bonda, Petrides, Ostry, & Evans, 1996; Puce & Perrett, 2003). Interestingly, activation of this region occurs only when the motion is presented in an upright orientation that is familiar to perceivers (Grossman et al., 2000). Similar findings have been obtained for the perception of faces. For instance, the STS shows selective responses to various

directions of eye gaze while humans observe either dynamic videos (e.g., Puce, Allison, Bentin, Gore, & McCarthy, 1998) or static images (e.g., Hoffman & Haxby, 2000) of the face. Cell recordings from STS neurons in non-human primates show that individual STS neurons show varying selectivity to specific flexions of the head or movements of the face in ways that have interpersonal significance, such as behavioral responses during dominance interactions (Hasselmo, Rolls, & Baylis, 1989). Thus, certain social context factors influence the neural processing of the face, and this influence likely carries functional importance. Also noteworthy is that bidirectional connectivity exists between brain areas that are sensitive to human motion (e.g., STS) and those associated with the processing of emotional content and threat (e.g., the amygdala; Amaral, Behmiea, & Kelly, 2003), suggesting that emotion perception can modulate the perception of human motion (see also, Chouhrouf et al., 2006; Poirier et al., 2005). Collectively, these findings parallel the findings we have reviewed for social judgments, highlighting the neural mechanisms that may underlie such effects.

We propose that the effects of social context for visual perception may be more pervasive, extending beyond low-level visual perception to higher-level aspects of person construal. Visual cues to one aspect of a target's identity may serve as social context that, once perceived, affect other aspects of person construal such as categorization and evaluation. Thus, social context may alter within-target aspects of perception.

Some evidence supports this possibility. Emotional body motion, for example, heavily biases the perception of sex categories (Johnson, McKay, & Pollick, 2010; Johnson, Pollick, & McKay, 2008). Point-light displays depicting angry body motions are overwhelmingly judged to be men; those depicting sad body motions are more likely to be judged to be women, arguably because emotion expression is sex-stereotyped. Similarly, the perceiving sex category membership from static body cues altered the perception of body motion implicated in perceptions of attractiveness (Johnson & Tassinari, 2007) and sexual orientation (Johnson, Gill, Reichman, & Tassinari, 2007). In other work, the hairline displayed on an otherwise ambiguous race face alters the perception of the target's race category membership, leading an identical face to be perceived as belonging to different race categories (MacLin & Malpass, 2001, 2003). And finally, the internal morphology of a face, indicative of race category, heavily biases observers' perception of the target's skin tone (Levin & Banaji, 2006). In each of these cases, a visual cue to a domain of social relevance – emotion, sex, hairstyle, and race category, respectively – modulated perception of the target along another dimension even though the cues were largely orthogonal to the judgment task at hand. This suggestive evidence is consistent with the notion that visual cues to one aspect of person construal may contextualize the perception of cues to a different aspect of person construal.

This perspective has far-reaching implications. Virtually all social psychologists would acknowledge a privileged role for categorizing others by sex, race, and age (and possibly sexual orientation) for important interpersonal outcomes. Yet the predominant theories and empirical work investigating the perception of social categories have failed to appreciate fully how the perception of one category and the cues that convey it can contextualize the perception of other categories.

This has occurred for two reasons. First, in most social categorization research, extraneous social categories are typically held constant – either experimentally or statistically. Second, as we discuss in depth later, the presumption remains that social category representations have a pure and discrete, stand-still, and non-overlapping nature. These facets of prior research are both a blessing and a curse. Such research yielded a clear understanding of the downstream consequences of social categorization (e.g., stereotype activation), but it failed to inform our understanding of how the person construal process unfolds in time. We now turn our attention to these issues and discuss how social categories and the cues that convey them serve as social context for both the process and product of social perception.

CATEGORIES AND CUES AS CONTEXT

Unlike the tightly controlled laboratory settings used as staging grounds to test theories with rigorously controlled experimentation, the social objects of our perception tend *not* to fall only into one social category. Instead, people fall into multiple social categories simultaneously. Research investigating the effects of social categories on meaningful interpersonal outcomes has failed to appreciate the complexities that the intersection of social categories (or intersectionality) introduces to the task of perceiving others.

Historically, social psychologists have focused their empirical work on the weighty consequences of perceiving social categories (Allport, 1954; Brewer, 1988; Fiske & Neuberg, 1990) and the inevitability versus malleability of encoding social categories (Blair, 2002; Maerae & Bodenhausen, 2000). Because of their focus, social categorization was taken as a given – a starting point after which interpersonal phenomena of interest occurred (e.g., stereotyping and interpersonal attraction). Little attention was paid to the determinants and processes leading up to social categorization, although they were acknowledged to be determined by factors such as available cues, motivations, and cognitive processes. The focus of this research was to explicate the *consequences* of social categorization, and therefore presumed a feedforward model of social categorization (see Figure 11.3a). The simple message from this line of work was that categorization had interpersonal consequences, and the research that fit into this framework was straightforward. Social categories were manipulated along one dimension, but remained invariant along other social category dimensions; stimuli depicted the category of interest for the particular study (e.g., sex), and held all other social categories constant (e.g., race, emotion state). Moreover, the factors that contributed to the social categorization in the first place were not centrally important to this research. This approach afforded precision in documenting the downstream consequences of social categorization at the cost of breadth of understanding. Consequently, our understanding of social perception remains incomplete.

One reason that the extant research yields an incomplete picture of social perception is its mistaken focus on dominance. As noted previously, the vast bulk of empirical research has eliminated intersectionality of social categories entirely through experimental manipulation. The few exceptions to this general rule reveal

perception, and all other categorical possibilities are removed from working memory through inhibition.

This implicit assumption is widespread, and which particular category comes to dominate perception is theorized to be the product of two types of motivation. At times, motivation to construe others in terms of a single category serves general processing objectives – to ease the task of perceiving others. This perspective stems from theoretical perspectives that presume observers to be motivated for cognitive efficiency (originally articulated by Allport, 1954). Thus, viewing others as falling into one dominant social category makes the job of the perceiver considerably easier. Evidence for this type of motivational impact is implied in several studies, but more generally, has been a driving force to understand which social categories are perceived in an obligatory fashion. Overall, three social categories seem to fit – sex, race, and age – and which of these comes to dominate perception varies with social composition.

At other times, motivation to construe others in terms of a single category serves more individualized or higher-level goals (e.g., to maintain one's own positive self regard). Social categories vary in the degree of status associated with them, and observers can use this to their advantage. When individuals have received unflattering feedback, for example, their categorization of others tends to highlight low-status aspects of the target's identity (Sinclair & Kunda, 1999). This pattern was theorized to originate in the motivated inhibition of a desirable stereotype and activation of an undesirable stereotype associated with the target's identity (Sinclair & Kunda, 1999).

Another reason that the extant research yields an incomplete picture of social perception is its presumption that social categorization involves either one or several discrete social category representations purely instantiated in working memory. Although few studies have directly examined the *process* by which social categorization occurs, much of the research that has looked at this implies that categorization evokes an “all or nothing” proposition (cf. Locke, Macrae, & Eaton, 2005). This particular perspective may have emerged because social psychological research has, by and large, made the assumption that the human brain represents social categories just as a digital computer might: as discrete symbols that are either on or off, active or inactive. This is consistent with classical notions of the mind as a computational *physical symbol system* (Newell, 1980; Pylyshyn, 1984), and discrete feedforward representational accounts of cognition (e.g., Fodor, 1983). Based on the misted assumption of discreteness in social categorization, the assumption of dominance described above comes naturally. If social categories were represented discretely, then one social category *must* dominate perception. All other possibilities must be defeated.

While appealing because it is elegant and intuitive, such work ignores decades of research in cognitive science and neurophysiology, carrying a clear message: The human brain does not work that way! That is, the brain is best described not as a computer operating on discrete symbols cycling on and off in idealized states, but rather as a complex biological system using collaborative neurons working in real-time (e.g., Spivey, 2007; Spivey & Dale, 2004, 2005). Two consequences of this research are that mental representations are seen as probabilistic (a collaboration

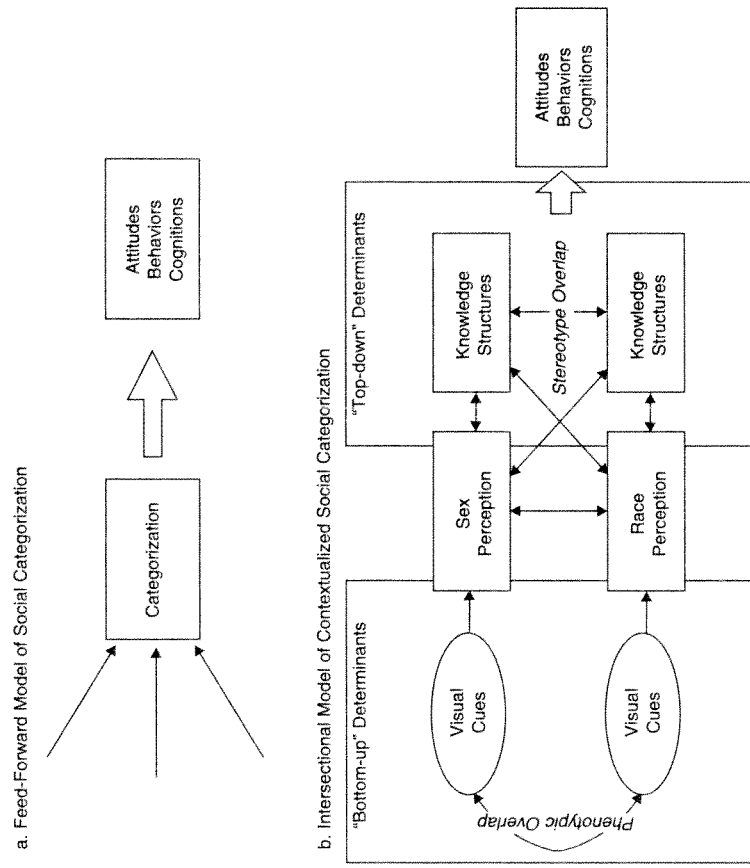


FIGURE 11.3 Models of social categorization: (a) The prevailing feedforward model of social perception that emphasizes categorization as a discrete representation of a dominant social category, and subsequently examines the downstream consequences thereof. (b) A simplified version of our proposed intersectional model of social perception in which visual cues to social categories continuously inform category activations through bottom-up visual perception processes and in which existing knowledge structures (i.e., stereotypes) modulate the perception and interpretation of visual cues to category membership via top-down processes.

a theoretical assumption underlying theories of social perception: that when multiple social categories apply to an individual (e.g., one's sex, race, and age), only one category domain (e.g., sex category membership) will come to dominate social perception. In one study that highlights this presumption, for example, participants were primed with either the Female sex category, the Asian race category, or no category at all (Macrae, Bodenhausen, & Milne, 1995). After watching a short video clip depicting an Asian woman, a lexical decision task assessed the activation of the applicable sex and race categories. Those participants primed with the target's sex showed activation of Female (i.e., faster latencies, relative to control) and inhibition of Asian (i.e., slower latencies, relative to control); those primed with the target's race showed activation of Asian category, and inhibition of Female category. These authors argued that one category therefore dominates

of neurons trying to stabilize) rather than pure (an idealized computer-like symbol), and that multiple representations may be simultaneously and partially active in working memory rather than proceeding one at a time in discrete form. Although now well documented in certain camps of cognitive science investigating lexical representations, the possibility that *social category* activations may be simultaneously or partially active in working memory is largely incompatible with the theoretical positions informing the vast bulk of social psychological research. Consequently, this research continues to presume that only one social category may be active at any given moment in time. It is thus not surprising that the mechanism by which one category alternative comes to dominate social perception has received little empirical attention.

The presumption that social categorization culminates in a discrete representation of primarily one category has been sufficient to address many specific questions, but it is insufficient to understand the complexities of social perception, more generally. We propose that social perceivers are faced with a complex perceptual task that is prone to be influenced heavily by context. Social targets "in the lab fit nicely within narrowly defined category boundaries; social targets "in the wild" do not. They vary in the conjunction of social category membership (sex, race, age, emotion state, and occupation, to name a few) and in the degree to which visual cues reveal these categories. During person construal, such factors are not perceived independently, but rather simultaneously, each contextualized by the presence of other orthogonal categories and cues. Put simply, social categories and the cues that convey them *are* social context. As such, the perception of one category or cue will inevitably affect the perception of another. This has implications for both the perceptual outcome and the processes that give rise to social percepts.

Specifically, characterizing social categories and the cues that convey them as context challenges the assumption that observers represent others as discrete representations of a dominant social category. Instead, we propose that person construal is a fluid and dynamic process by which probabilistic – and never pure – representations of others affect one another throughout social perception. One simplified model of this process is depicted in Figure 11.3b. Rather than a simple feedforward process that focuses on the implications of social categorization, an intersectional model of social categorization recognizes that the perception of social categories is heavily negotiated by context afforded by other aspects of person construal. Notably, because cues that support categorization are likely to vary in their diagnosticity, social categorization may be best represented as a dynamic process – continually incorporating the available evidence, not achieving discrete representations of dominant categories, but rather stabilizing on working representations across a probabilistic journey of gradual perceptual uptake (see Freeman, Ambady, Rule, & Johnson, 2008; Spivey & Dale, 2004). Moreover, the perception of one category may recruit knowledge structures about an orthogonal social category because of the similarity of stereotype content – and this may affect perception of another social category. This possibility implies a top-down moderation of perceptual processes that can alter the perceptual endpoint. Evidence for our contention that social categories and the cues that convey them serve as

context for perception comes from two programs of work – one focused on temporal dynamics of person construal, the other focused on the intersectionality of social categories.

SOCIAL CONTEXT FROM PERCEIVED CUES: THE TEMPORAL DYNAMICS OF SOCIAL CATEGORIZATION

Many experimental paradigms within social psychology follow some variation of a basic method: (a) a face is shown on a computer screen; (b) it is categorized by race, sex, age, or emotion (depending on the study); and (c) the experimenter measures the consequences. To be sure, important visual information is being processed between the onset of the image and the categorization that takes place, even though this occurs on the order of milliseconds. Yet the nature of this process has remained obscure and generally of little interest to social psychologists. This is unfortunate.

Two considerations make understanding the process of social categorization critically important. First, our theories have used an outdated model. We now understand the human brain as composed of collaborative neuronal populations continuously working in real-time, rather than as a digital computer working in discrete stages (although some continue to oppose this position; Dietrich & Markman, 2003). Second, from a Gibsonian perspective, the social world is composed of ecologically valid targets that provide continuous stimulation – rather than discrete inputs like flashes on the computer screen familiar to the social psychology lab. Taken together, the importance of understanding social categorization as a continuous rather than discrete process becomes critical.

Part of the problem is that prevailing social psychological accounts of the person construal process, presuming discreteness, do not fit with actual neurophysiological evidence for the way the human brain continuously – and not discretely – takes up perceptual information across person construal. In a classic study, Rolls and Tovee (1995) recorded the activity of monkey neurons in STS and inferotemporal cortex while monkeys were presented with faces. Not surprisingly, many of these neurons were more selective to one given face or another. For instance, one population of neurons coded the recognition of one face and a separate population coded the recognition of a different face. More remarkable, however, is how these populations achieved their firing rates over time. In just the first 70 ms after catching sight of a face, the corresponding neuronal population for that face already reached about 50% of the full activity that it would exhibit several hundred milliseconds later at conscious face recognition. Thus, the remaining 50% of the perceptual information was continuously gathered and encoded across several hundred milliseconds to gradually – and not discretely – stabilize on the recognition of another's face.

Such evidence highlights the person construal process as a dynamic and fluid process wherein neuronal populations continuously incorporate the perceptual information from the world and gradually stabilize on particular working representations of others. This is quite a different story than that of prevailing social psychological accounts, which presume that all perceptual information is

immediately available the moment a face suddenly appears (an experience only happening in the lab). According to these accounts, several hundred milliseconds after the onset of a face stimulus, a discrete representation of a social category “pops” into consciousness – and then out of consciousness shortly thereafter, once a categorical judgment has been made, as if processing of the target has finalized with a keyboard press and working representations immediately vanish from working memory.

This prevailing account of social categorization is sharply at odds with our proposal that social categorization involves multiple probabilistic representations, which are simultaneously and partially active across construal and gradually settle onto ultimate categorical judgments. We have recently provided evidence for this proposal. In one study, we (Freeman et al., 2008) presented participants with computer-generated male and female faces at the bottom-center of a computer screen. Participants categorized the sex of these faces by mouse-clicking a “Male” or “Female” label in the top left and right corners of the screen. Critical trials involved atypical male and female targets whose sex was generated at a level systematically closer to the opposite sex. For instance, a typical target would be a random face generated at 100% Male. This face was then morphed to depict 75% Male and 25% Female features, producing an atypical target. Though participants reliably chose the correct sex category, an analysis of participants’ computer mouse trajectories as they did so was revealing. Relative to the more typical trials, when categorizing atypical targets, participants’ hand movements were continuously more attracted toward the opposite sex category, which appeared on the opposite side of the computer screen (see Figure 11.4).

This continuous spatial attraction in hand movements indicates that across the course of social categorization, participants were continuously integrating input from multiple perceptual cues (i.e., physical evidence of both Male and Female category alternatives) that fluidly stabilized into a single confident interpretation of the face’s sex category membership. This pattern of results was also obtained for race categorization (Freeman, Pauker, Applebaum, & Ambady, 2010). Prevailing accounts of social categorization, grounded in the assumption of discreteness, could neither predict nor explain this pattern of results. Yet the pattern is indeed informative. We argue that person construal is a dynamic process in which a perceiver’s interpretation of the face reflects the continuous update of multiple probabilistic representations, guided by the gradual accumulation of perceptual evidence. In a later study, this was also extended from social category activation to the triggering of category-associated stereotype knowledge (e.g., male → *aggressive*, female → *caring*), showing how dynamic competition during social categorization continuously cascades into the partial and parallel activation of associated stereotypes (Freeman & Ambady, 2009).

This kind of dynamic social perception is precisely what person perceivers would require if social context information indeed interacts with lower level perceptual information to guide person construal, as we have argued throughout this chapter. Indeed, such a premise is supported by a wealth of neurophysiological evidence for the existence of recurrent feedback supplied by many projections from higher-level neural subsystems back down to lower-level visual cortex (Douglas,

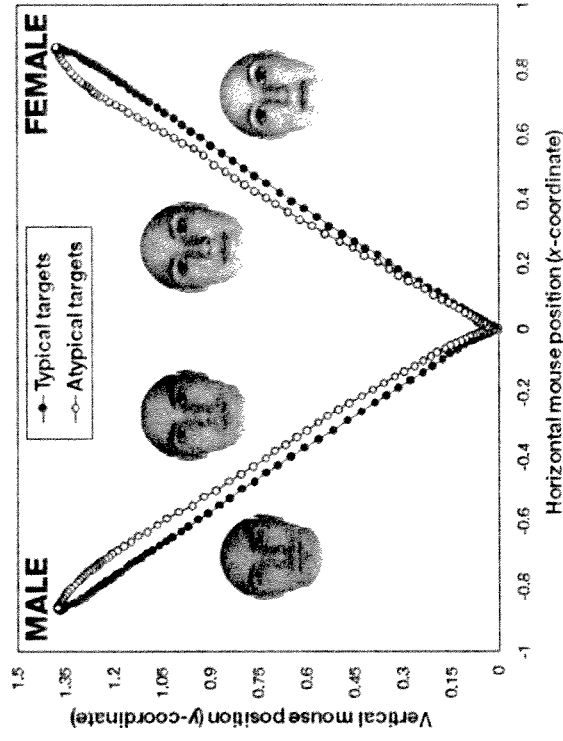


FIGURE 11.4 Dynamic social perception (adapted from Freeman et al., 2008). Participants are presented with computer-generated male and female faces at the bottom-center of the screen. Faces are categorized by sex by moving the mouse from the bottom-center to either the Male or Female label while mouse movements were recorded. Mean mouse trajectories are plotted. Male targets were either typical, generated at 100% Male (A), or more atypical, generated at 75% Male and 25% Female (B). Mean trajectory for atypical male targets (white circles, left side) exhibits a statistically reliable continuous attraction towards the “Female” label, relative to mean trajectory for typical male targets (black circles, left side). Female targets were either typical, generated at 100% Female (C), or more atypical, generated at 75% Female and 25% Male (D). Mean trajectory for atypical female targets (white circles, right side) exhibits a statistically reliable continuous attraction towards the “Male” label, relative to mean trajectory for typical female targets (black circles, right side).

Koch, Mahowald, Martin, & Suarez, 1995; Gilbert, 1998; Gilbert, Ito, Kapadia, & Westheimer, 2000). Such evidence is cited to explain numerous top-down context effects in non-social domains of visual perception, such as the McGurk effect (McGurk & MacDonald, 1976).

In sum, investigations examining the temporal dynamics (Freeman et al., 2008; Freeman & Ambady, 2009; Freeman et al., 2020) and neurophysiological underpinnings of social categorization (reviewed briefly above) point to a dynamic person perception process. In contrast to prevailing accounts that pivot around dominance and discreteness, our proposal characterizes person construal as dynamic and continuous, involving probabilistic representation of social categories. We call this perspective a *dynamic continuity account* of person construal (Freeman et al., 2008).

SOCIAL CONTEXT FROM PERCEIVED CATEGORIES: ON THE COMBINATORIAL NATURE OF CATEGORIZATION

In many ways, the dynamic continuity account of person construal focuses on how cues continuously and dynamically affect the representation of others. In addition to varying in the degree to which visual cues dynamically compel a particular categorization *within* a domain, targets of social perception also vary *across* social category domains. Social targets of visual perception are not only men or women, but also young or old; black, white, Asian, etc. This reality has scarcely been incorporated into prior research even though observers are likely to attend to the combination of these dimensions as person construal unfolds. We propose that the perceptions of multiple category domains, though orthogonal in reality, are likely to be perceived interdependently. That is, we propose that the perception of one category domain will modulate the perception of other social category domains. This is likely to occur for at least two reasons.

To be sure, the perception of one social category may affect the perception of another social category due to phenotypic overlap in the visual cues associated with each domain. For example, physical cues to sex category are conflated with the muscular configuration of emotion state and are tethered to perceptions of dominance and affiliation (Hess, Adams, & Kleck, 2004, 2005). Because the morphological cues to two distinct domains of social perception are conflated, the perception of one domain biases perception of the other domain. In many ways, this type of effect can be considered a *bottom-up* effect of intersectionality on person construal.

The perception of one social category may also affect the perception of another social category because prior knowledge structures bias perception. Although it is undeniably the case that social categories are orthogonal in reality (e.g., sex and race do not covary), the notion that they are also orthogonal psychologically is less clear. Indeed, there is good reason to predict that some intersecting social categories will be psychologically conflated. It is this aspect of intersectionality that we will now turn to.

Visually perceiving cues that are diagnostic of a social category is sufficient to activate knowledge structures that are associated with the category (Bargh, Chen, & Burrows, 1996; Mason, Cloutier, & Macrae, 2006). Consequently, perceiving visual cues for the Female category is likely to evoke the activation of traits such as shy, family-oriented, and soft-spoken (Bem, 1974; Devine & Elliot, 1995; Karlins, Coffman, & Walters, 1969; Spence, Helmreich, & Strapp, 1974). Similarly, perceiving visual cues for the Male category is likely to induce activation of traits such as aggressive, dominant, athletic, and competitive (Bem, 1974; Devine & Elliot, 1995; Spence et al., 1974). It is therefore unsurprising that these knowledge structures, once summoned, influence impression formation and interpersonal interactions.

Yet we propose that the impact of these activated knowledge structures may extend to other aspects of social perception as well, even affecting the perception of other social categories. One need only look to the stereotype content of intersecting social categories to see why this might be the case. The sex-role stereotypes

listed above, for example, apply not merely to sex categories, but also to race categories. That is, the traits shy, family-oriented, and soft-spoken apply not only to the Female category, but also to the Asian category (Bem, 1974; Devine & Elliot, 1995; Ho & Jackson, 2001; Karlins et al., 1969; Spence et al., 1974). Similarly, the traits aggressive, dominant, athletic, and competitive apply not only to the Male category, but also to the Black category. While it is certainly not the case that stereotype content shows a wholesale overlap between these social categories, it is evidence that a substantial degree of overlap exists. And this has broad implications for other aspects of perception.

Because of overlapping stereotype content, the activation of knowledge structures from the perception of diagnostic visual cues may also be sufficient to activate another social category. Thus, perceiving one social category may contextualize the perception of another social category via this top-down route. Thus perceiving the category Black will activate the associated stereotype and, because of the overlapping content, also activate the category Male. Similarly, perceiving the category Asian will activate stereotype content that will in turn activate the category Female. This has implications for the efficiency of social categorization.

Together with our colleagues, we have tested these ideas in a series of studies designed to assess how intersecting social categories affect perception (Johnson, Freeman, & Pauker, 2010). We predicted that the efficiency of sex categorization would vary as a function of race category membership because of the degree of compatibility between the stereotypes evoked. Specifically, we predicted that sex categorization would be facilitated when compatibility between stereotypes is high (e.g., Black Men or Asian Women), but impaired when compatibility between stereotypes is low (e.g., Black Women or Asian Men).

We tested these predictions using several methods. For each study we generated a stimulus set that varied continuously across three race categories: Black to White to Asian. In one study these stimuli were designed to be gender-ambiguous. Participants provided sex category judgments for these stimuli. We found a striking dependency between the apparent race category of the stimuli and observers' judgments of sex category. Black faces were more likely to be judged to be men; Asian faces were more likely to be judged to be women. Thus, a target's race category that was irrelevant to the judgment task nevertheless biased perceptions of sex category.

In other studies, we exploited the mouse-tracking method described previously to determine the degree of interference that the irrelevant race category exerts on sex categorization (see Figure 11.5). In these studies, both male and female stimuli varied continuously in apparent race category. We predicted, and found, that faces for which intersecting social categories shared stereotype overlap (i.e., Black Men and Asian Women) elicited mouse trajectories that were relatively direct. Faces for which stereotype overlap was low (e.g., Asian Men and Black Women), in contrast, did not. On these trials, mouse trajectories revealed a significant deviation (toward the interfering social category on the opposite side of the computer screen) from an idealized linear trajectory. Again, these effects obtained in spite of the fact that race category was irrelevant for the sex categorization at hand.

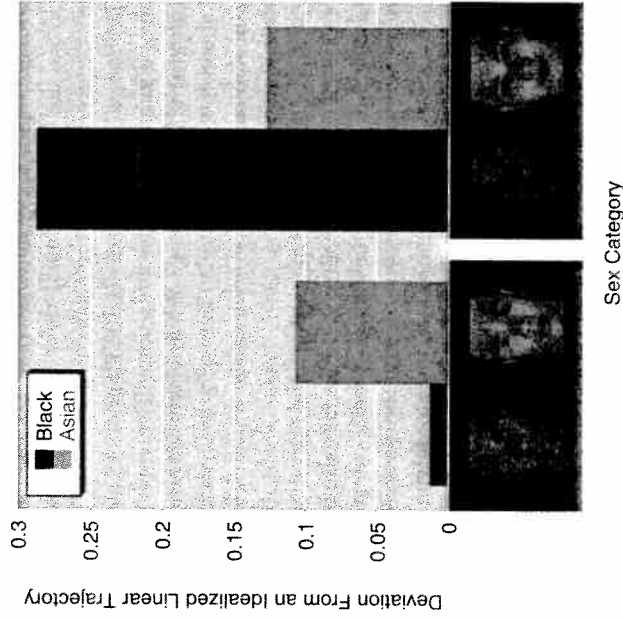


FIGURE 11.5 Mouse trajectory deviation for targets with intersecting identities. This depicts the deviation from an idealized linear trajectory for sex category judgments of faces that varied in both sex and race (adapted from Johnson et al., 2010). Combinations for which stereotype overlap was high (e.g., Black Men and Asian Women) compelled more direct trajectories than combinations for which stereotype overlap was low (e.g., Black Women and Asian Men).

We interpreted these and other effects as evidence for top-down mediation of sex categorization due to overlapping stereotypes. Indeed, in a final study, we found more direct evidence for our interpretation. We repeated the mouse-tracking study, but also assessed the degree of stereotype overlap between the categories Black and Male and the categories Asian and Female using a modified Implicit Associations Test. Among participants for whom these associations were strong, mouse trajectories and reaction times for sex category judgments were perturbed when categorizing targets with mismatched stereotypes (i.e., Black Women and Asian Men). Among participants for whom these associations were low, such measures were less heavily impacted.

CONCLUSIONS

We have presented evidence that challenges prevailing notions of social categorization. We characterized social categories and the cues that convey them to be social context that continuously influences the process and product of social categorization. The evidence that we have presented suggests that social perception does not involve a discrete representation of a dominant social category, but rather

is a dynamic and fluid process, involving multiple probabilistic representations both within and between category domains, and is heavily influenced by both top-down and bottom-up perceptual mechanisms.

Our theoretical approach to social perception represents a clear shift toward understanding the mind as a dynamic biological system and away from analogies that liken it to a computing device. In doing so, we characterize person construal as a process in which populations of neurons gradually stabilize over time (e.g., Spivey, 2007). This perspective emphasizes the interaction between top-down and bottom-up processes that fluidly integrate over fractions of a second to yield our everyday impressions of others. An integrated mind of this sort, operating interactively and continuously over time, is essential for the demands of social perception (Freeman & Ambady, 2009; Freeman et al., 2008). In social perception in day-to-day life, the perception of others' emotions, intentions, and other social characteristics must be continuously updated from a stream of sensory information that is in a constant state of flux. By adopting this approach, we join a growing number of cognitive scientists (e.g., Spivey, 2007; Spivey & Dale, 2004, 2006) and vision scientists (e.g., Song & Nakayama, 2008), among others, in characterizing human perception as a highly integrative and dynamic system that collaborates with both cognition and action.

As our opening quote makes clear, J. J. Gibson recognized other people to be among the most important stimuli to be visually perceived in the environment. While most of our social psychological colleagues would warmly embrace this particular premise, we hope that this chapter, and the work reviewed within it, begins to challenge the long-held and idealized models of person construal, replacing them with an understanding of the dynamic and highly integrated nature of social perception. Indeed, Gibson recognized perception, in general, to be a dynamic process, stating: "The theory of affordances rescues us from the philosophical muddle of assuming fixed classes of objects, each defined by its common features." Similarly, we believe that the prospect of a Gibsonian understanding of the dynamic nature of person construal will rescue us from the muddle of ill-specified models, permitting us to see beyond the theoretical and empirical constraints imposed by dominance and discreteness.

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