**Bridging the Gap between Spontaneous Behavior- and Stereotype-based
Impressions**

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Introduction

Since the earliest days of social psychology, researchers have been interested in understanding how processes involved in perceiving *people* differed from those involved in perceiving *objects* (Asch, 1946; Heider, 1958). The principle that came to guide the field of social cognition was that humans are inherently social beings, and consequently their minds may process information about other humans in distinctive or specialized ways (Hamilton & Stroessner, 2020). Indeed, there grew to be a large body of work documenting the cognitive mechanisms that demonstrated the social perceiver's propensity for quickly making sense of other individuals or groups of individuals, likely in anticipation of future interpersonal interaction. In this chapter, we highlight a gap between spontaneous behavior-based inferences about social targets and another critical form of social inference that we have each investigated in our own research: stereotype-based inferences. Our goal is to bridge this gap in the literature that explores spontaneous behavior-based inferences on the one hand and stereotype-based inferences, particularly racial stereotyping, on the other.

Spontaneous Trait Inference and Stereotypic Inference as Overlapping Processes

Social perception and judgment can involve a wide range of processes and outcomes. Here, we are interested in the subset of that literature focusing on the social cognitive processes by which we get to know and make judgments of others. Generally speaking, this literature is known by many names: person perception, person memory, and impression formation, among others. Within this literature, research varies in the inputs, processes, and outputs of theoretical and empirical focus. One foundational advance to this body of social cognition research was the

discovery of the process known as *spontaneous trait inference* (spontaneous trait inference), the act of efficiently and effortlessly interpreting a person's behavior as indicative of their personalities (Winter & Uleman, 1984). Work by Jim Uleman and his colleagues definitively showed that a perceiver witnessing Sally help an old lady cross the street would readily infer that Sally was a helpful person. Inferences of this nature share some features with another foundational social perception phenomenon: stereotyping.

Spontaneous Trait Inference vs. Stereotyping: Similarities and Differences

By generalizing from acts to dispositions, perceivers are actively interpreting targets' behaviors and "going beyond the information given" to generate trait-based target representations. From our perspective, these generalization processes sound a lot like another socially significant process: stereotyping. While definitions abound, stereotyping involves going beyond the information given by 1) inferring a person's social group membership from available cues (e.g., their appearance), and 2) subsequently using any traits and characteristics associated with that social group as a lens for judgments of the individual. As mentioned earlier, when people see Sally help an old lady cross the street, they infer that Sally is a helpful person (Todorov & Uleman, 2002, 2003; Winter, Uleman, & Cunniff, 1985; Uleman, 1987). In addition, when people meet Sally and learn that she is a nurse, they also spontaneously infer that she is a helpful person, without reference to information about her behavior (Chen et al., 2014). Both the *spontaneous trait inference* and the *spontaneous role inference* (extrapolating a person's traits based on their social role) constitute the perceiver actively interpreting knowledge about Sally (behavior- or role-based) as indicative of her character. More generally, we believe that the intersection of the processes of spontaneous trait inferences based on targets' behavior and

stereotyping based on targets' social group memberships is under-examined and deserves direct theoretical and empirical comparison.

We highlight spontaneous trait inferences specifically as a form of behavior-based inference to honor Uleman's groundbreaking work, but also because spontaneous trait inferences enable the most direct comparisons between behavior- and stereotype-based inferences. Both occur spontaneously at early stages of information processing and are formed on the basis of similarly minimal cues (faces or category labels for stereotypic impressions; individual behavioral episodes for spontaneous trait inferences). Like stereotyping, spontaneous trait inference constitutes a precursor to other processes guiding the formation, representation, and retrieval of impressions in models of person memory (e.g., Hastie et al., 1980). Similarly, spontaneous trait inferences are likely formed prior to (and potentially influencing) attributional processes reflecting deeper consideration of causal forces, or information over time across episodes and individuals (e.g., covariation model; Kelley, 1967). In addition, spontaneous trait inferences reflect a focus on a single cue—behavior—at the expense of other potentially impactful elements guiding impression formation such as expectancies or situations, while stereotyping arguably reflects a focus on a single cue—expectancies—at the expense of behavior or situations.

We explore this comparability below, documenting theoretical and methodological factors that have created a gap between the two literatures and considering several implications. We conclude by suggesting directions for research in an effort to bridge the gap and to make research exploring spontaneous trait inferences more inclusive and generalizable.

Diverging Inputs of Focus in Stage Models of Behavior- and Category-Based Impressions

Indeed, models of person perception and impression formation involve very similar processes regardless of whether the initial input is behavior (e.g., Gilbert, Pelham, & Krull, 1988) or membership in a group such as a socially significant category or role (e.g., Brewer, 1988; Fiske & Neuberg, 1990). With respect to person perception, Gilbert et al. (1988) conceptualized the process as involving three broad stages: categorization, characterization, and correction. First, the perceiver categorizes the target's behavior via dispositional inference, judging what kind of mental state the behavior implies. The perceiver then characterizes the target via trait inference, applying the dispositional inference. Finally, in the face of either contradictory information or knowledge of an acute situational pressure to act, and assuming motivation and capacity, the perceiver corrects their impression of the target based on behavior that suggests different trait inferences (see also Trope, 1986, for a similar stage model).

Similarly, Brewer (1988) and Fiske & Neuberg (1990) proposed models of stereotype-driven impression formation that describe similar processes of categorization, characterization, and correction. However, their focus on “inference” does not describe moving specifically from observed target behavior to a personality trait, but moving from a variety of observed target cues to a social category membership (i.e., what group in my mental representation does this target best match?). According to these impression formation models, the social perceiver first categorizes the *target themselves*, rather than their behavior, via social categorization and/or stereotype activation. The perceiver then characterizes the target via trait inference, but in this case the trait derives from the activated stereotype. Finally, processes of correction are applied in the face of contradictory information—in this case,

stereotype-contradictory information, which may present in the form of stereotype-incongruent behavior from the target.

Tests of these models typically begin at the same starting point: the presentation of an unknown target. In the case of spontaneous trait inference, the target is often labeled with nothing more than a name; even when the stimuli include categorical cues—generally role or occupation labels—the disposition-suggestive behaviors are chosen to be low in stereotypicality (i.e., neither so stereotypical as to be redundant with category membership nor so counterstereotypical as to be implausible; e.g., Winter & Uleman, 1985). In the case of stereotypic inference, the target is either visibly identifiable as a member of a particular social category or labeled as such. But despite this initial difference in input, the subsequent processing appears to be very similar, in terms of processing characteristics and moderators for behavior-based versus stereotype-based impressions. In both domains, for example, the processes of categorization and characterization are at least conditionally automatic, and are moderated by perceivers' capacity and motivations, including both social versus non-social processing goals (person perception: e.g., Uleman & Moskowitz, 1994; Uleman et al., 1992; Winter et al., 1985; stereotyping: e.g., Macrae et al., 2005; Moskowitz et al., 1999; Quinn & Macrae, 2005; Spencer et al., 1998). Ultimately, models of person perception and impression formation converge to claim that perceivers eventually place the target on a continuum ranging between a (trait or social) category-based versus individuated impression based on all of the information available (including behavior) with a bias toward confirming the initial categorization.

Non-overlapping Empirical Focus in the Spontaneous Trait Inference and Stereotyping Literatures

Despite these similarities and hypothesized links between person perception and impression formation, we struggled to think of studies representing points of overlap where the stereotyping and impression formation were jointly investigated. And, despite the fact that social cognition researchers are frequently interested in understanding issues related to stereotyping and prejudice, the area of behavior-driven person perception has not fully integrated knowledge about how social category stereotypes, and related processes such as egalitarian motives, impact impression formation processes. In particular, racially heterogeneous contexts and cross-race impression formation processes remain understudied. Historically speaking, the trait inference and stereotyping literatures have seemingly progressed independently, such that trait inferences were studied in largely racially homogeneous contexts and research on stereotyping was not explicitly linked to informing models of impression formation. For example, while the early impression formation literature acknowledges a differential impact of trait- versus category-based impression, only one study comes to mind that explored the effects of a racial category-based impression while using more traditional impression formation methodologies (Stewart et al., 1998). We see an opportunity to integrate these two literatures in ways that will broaden the scope and legacy of Uleman's signature contribution to the field. Furthermore, we comment on recent encouraging developments, spearheaded by Uleman and others, that begin to diversify the person perception literature.

What We Know About the Connections Between Spontaneous Trait Inferences and Stereotyping

Stereotype Inconsistency Disrupts Spontaneous Trait Inferences

Despite the commonalities between spontaneous trait inferences and stereotyping, only a few studies have investigated their interplay. One example was reported by Wigboldus et al. (2003). They used a reaction-time paradigm in which sentences (including sentences that described behaviors with clear trait implications) were presented briefly on a computer screen, and then quickly replaced with a target word; the participant's task was to indicate whether the target word appeared in the preceding sentence. Importantly, the trait-implying sentences either described the target in categorical terms (e.g., "the girl") or were primed subliminally with a category label. Across five experiments and using a variety of targets (e.g., *girl*, *skinhead*, *professor*, *nurse*), Wigboldus et al. demonstrated that dispositional inferences were less likely to be applied to targets when those inferences were inconsistent with stereotypes about the target's social category—that is, spontaneous trait inference was less likely to occur. Gonzalez et al. (unpublished; as cited by Uleman et al., 2012), using Uleman's standard false-recognition paradigm, similarly demonstrated that trait implications were less likely to be bound to targets when those traits were inconsistent versus consistent with the target's gender stereotype. These findings converge with work by Yan et al. (2012), who found that gender stereotypic spontaneous trait inferences were more strongly formed than gender counter-stereotypic spontaneous trait inferences.

Spontaneous Trait Inferences Can Be Formed for Group Targets

Another extension of the spontaneous trait inference literature focused on how these processes could be applied to the perception of groups' behaviors, thereby "sowing the seeds" of stereotyping (Hamilton et al., 2015). Specifically, Hamilton et al. (2015) noted that spontaneous trait inference research uniformly presented individual targets, despite the fact that social perception regularly involves perceiving groups of individuals performing trait-implying behaviors (e.g., the teachers went on strike, the church group visited an impoverished village to provide aid, the CEOs lobbied Congress against tax increases). Adapting Uleman's false recognition probe paradigm, Hamilton et al. presented participants with groups (collections of four individuals) described as engaging in trait-implying behaviors similar to the aforementioned examples. After participants viewed a series of groups engaging in trait-implying behaviors (vs. filler behaviors that did not imply a trait), they were shown the same groups and a probe word, which they were asked to identify as having been in the sentence about that particular group or not. The probe word was either a matched trait (implied by that specific group) or a mismatched trait (implied by another group). Participants were more likely to falsely recognize the matched traits than the mismatched traits, the signature evidence of spontaneous trait inferences. These results suggested that perceivers generate spontaneous trait inferences about groups (sometimes referred to as STIGs). In other words, learning that a fraternity group partied all weekend without any breaks might imply that the group is irresponsible, and perceivers who witness or learn about this behavior would readily form the spontaneous trait inference that this group is irresponsible. Importantly, Hamilton et al. demonstrated that spontaneous trait inferences generalized from the original four members of the group to a new group member who was not involved in the

trait-implying behavior. Therefore, the spontaneous trait inference transfers between group members and the spontaneous trait inference itself can be considered a trait impression at the group level (not about any particular group member). The importance of generalization from the trait inference about the group to individual members, regardless of their role in the group's behavior, is an important mechanism by which stereotypes about a group can be formed.

Future Directions: Decolonizing the Spontaneous Trait Inference Literature by Expanding the Intersection of Spontaneous Trait Inference and Racial Stereotyping Research

Although the studies at the intersection of spontaneous trait inference and stereotyping research summarized above provide an initial understanding of how stereotypes constrain spontaneous trait inferences and how spontaneous trait inferences about groups may contribute to stereotype formation, there are many unanswered questions about the interplay between stereotypes and spontaneous trait inferences for future investigation. Additionally, we would be remiss not to point out that the divide we've described above between spontaneous trait inference and stereotyping research also reflects a notable divergence in the consideration of race, gender, ethnicity, and other social identities with respect to the research questions, stimuli, participants, and researchers engaged in work exploring social perception processes other than stereotyping (e.g., attribution, person memory) with only a few exceptions (e.g., Stewart et al., 1998; Xie et al., 2019). These concerns are not unique to the literature exploring social perception and judgment. Indeed, the field of psychological science finds itself in a time of uncertainty and change as we respond to critiques that challenge us to grow into a more open, reproducible, and inclusive endeavor (e.g., Arnett, 2008; Cheon, Melani, & Hong, 2020; Murphy et al., 2020; Roberts, Bareket-Shavit, Dollins, Goldie, & Mortenson, 2020; Syed & Kathawalla, 2020) and

offer suggestions for how we can make progress on this front (Ledgerwood et al., 2021; Ledgerwood et al., 2020).

Keeping these goals in mind, this section outlines how the convergence of these two research literatures can contribute new knowledge with an admittedly biased focus on race and ethnicity. Thus, the directions for research that we've outlined reflect questions of theoretical interest *and* contribute to a process of making spontaneous trait inference research more broadly inclusive and generalizable. Where applicable, we identify any existing efforts toward this goal reflected in the work of Jim and others and propose a few opportunities for continued progress.

Intersection of Behavior- and Stereotype-Based Inference Processes Unfolding Over Time

A potential avenue for fruitful integration of the spontaneous trait inference and stereotyping literatures would be to examine the time course of processing and establish the conditions under which behavioral trait inferences versus stereotypic trait inferences might come to dominate impressions. The scant literature available on this question (Gonzalez et al., unpublished; Wigboldus et al., 2003; Yan et al., 2012) suggests that stereotypes constrain trait inferences, and there are reasons to expect that this would be the typical state of affairs. Although current models of person perception tend to posit parallel rather than serial processing of information (e.g., Freeman & Ambady, 2011) and thus allow for the theoretical possibility for category membership and behavior to exert equal or mutually constraining influence on impressions, evidence suggests that the accumulation of evidence for categorical versus individuated impressions differs in the time needed (e.g., Cloutier et al., 2005; Quinn et al., 2010). Based on this evidence, it seems reasonable to expect that the categorization of the

target's group membership should typically precede the categorization of the behavior's dispositional implications simply because social categorization can proceed with very little input (e.g., on the basis of easily extracted superficial cues such as skin tone, which can be detected in a matter of milliseconds), whereas behavioral categorization would take longer simply because behaviors unfold over time.

This conjecture, however, ignores a number of interesting questions about the development and updating of impressions over time. One key difference between the spontaneous trait inference and stereotypic impression literatures is that stereotype-driven impressions are anchored by long-standing stereotypes, whereas the literature on spontaneous trait inferences documents a process whereby an impression is generated on the basis of behavior committed by a target for whom the perceiver has no pre-existing associations. These pre-existing associations have important implications: A great deal of research has suggested that stereotypes act as attentional filters that direct our processing vis-a-vis stereotype-consistent versus -inconsistent information. According to the encoding flexibility model (Sherman et al., 1998), for example, stereotypes serve to direct attention toward stereotype-inconsistent information, because the conceptual fluency of stereotype-consistent information means it can be comprehended and assimilated into the existing impression with little effort.

Thus, stereotype-based inferences are anchored from the beginning of the person perception process (assuming category membership is immediately accessible), and these stereotypes continue to direct attention with each new piece of information about the target. In the case of behavior-based inferences, however, absent long-standing stereotypes, there are no attentional filters to guide initial impression formation. An interesting question is whether the

initial behavior-based inferences are strong enough to act as attentional filters and anchor subsequent inferences about new information, and the processes by which such updating of impressions might occur (see Moskowitz, Olcaysoy Okten, & Schneid, this volume). Some research suggests that they are not, in that implicit revision of impressions has been documented repeatedly (e.g., Gawronski & Bodenhausen, 2006; Wyer, 2010, 2016; for a review, see Coan et al., 2017) and can emerge even after a significant delay between initial behavioral encoding and subsequent reinterpretation (e.g., Mann & Ferguson, 2017). An open question, therefore, is whether there is a certain type or amount of behavior-based inference that is necessary for spontaneous trait inferences to have attentional filtering capacity.

Another interesting question about the time course of these processes is whether slower-to-accumulate behavioral information can override the stereotypes activated by the rapid detection of social category membership. Of course, stereotype-inconsistent behaviors are assumed to initiate correction processes (e.g., Brewer, 1988; Fiske & Neuberg, 1990). What we're referring to, however, is the capacity for dispositional attributions to compete successfully with stereotypic attributions in initial impressions. Stated differently, are there conditions that might facilitate the extraction of dispositional inferences from behavior, giving them a chance to compete with stereotypic inferences from categorization? One possibility rests on the question of what stereotypic attributions reflect. It seems intuitively reasonable that stereotypic attributions are a form of trait attribution, and that the trait being applied to the target is part of the stereotype content—a view that we endorsed at the outset of this chapter. In this case, spontaneous trait inferences and stereotype-based attributions are functionally equivalent, differing only in the ease with which the driving cues can be extracted. This intuition, however, is untested. Perhaps

stereotypic attributions are more transient in nature, reflecting attributions of the target's current dispositions or goals. In this case, the two forms of attribution might not be functionally equivalent, and some evidence suggests that goal inferences are inferred faster than trait inferences (Van Overwalle et al., 2012).

This goes back to the question of whether spontaneous trait inferences can anchor construal of subsequently encountered information and hinges on the capacity of visual cues to activate trait-based inferences. One of the hallmarks of spontaneous trait inferences is that they are tagged to the actor (Todorov & Uleman, 2002, 2003, 2004). Specifically, in studies using the standard false-recognition paradigm, participants erroneously recall the presentation of trait words implied by the behavioral descriptions more frequently when the recall cue is the actor versus another individual who was also presented with the behavioral description, and regardless of whether the actor image presented at recall is the one presented at encoding or another image of the same actor. If spontaneous trait inferences are linked to the actor and if visual representations of actors have implications for subsequent processing of new information (which the small literature on evaluative generalization to perceptually similar faces suggests; e.g., Gawronski & Quinn, 2013; Verosky & Todorov, 2010), then perhaps the impact of rapid categorical processing can be constrained. Indeed, evidence suggests social categorization can be offset by target familiarity, such that for familiar targets, even early construals are based on identity more than social category (Quinn et al., 2009).

Spontaneous Trait Inferences in Racially Diverse Contexts

Importantly, the majority of past work has examined social roles about which there are stereotypes (e.g., nurse, skinhead, professor) or focuses on creating stereotypes about novel groups experimentally. Although some work has examined the role of gender on spontaneous trait inferences (Gonzalez et al., unpublished; Yan et al., 2012), there is a large gap in understanding how racial group memberships impact spontaneous trait inferences. To our knowledge, the only published study that has explored the effects of a racial category-based impression while using more traditional impression formation methodologies was embedded in Stewart et al. (1998). They investigated whether inferences drawn from one person's behavior would influence a future judgment of the same person. In their Experiment 3, they asked White participants to make timed trait inferences from behaviors (Black-stereotypic or neutral) first associated with photographs of Black or White actors, and then again with the same or a different Black or White actor. Analyses of the facilitation scores revealed a predicted actor–context effect: Trait inferences were facilitated when a behavior was associated with the same vs. a different actor, and even more so when the behavior was stereotypic vs. neutral. However, this experiment studied deliberate rather than spontaneous trait inferences. While it is possible that prior spontaneous trait inference work using faces has incorporated greater variability in the racial and ethnic identities of the faces used, this information is rarely specified and never the empirical focus (e.g., Todorov & Uleman, 2002; 2003). Thus, research on the influence of racial group membership on spontaneous trait inference formation is needed.

Another interesting research avenue that is sparked by considerations of cross-race impression formation is the influence of social motivations in the processing of spontaneous trait

inferences. Whereas there is some work on motivated impression formation (see Fein, 1996, on how suspicion of ulterior motives disrupts spontaneous trait inferences), most of this work focuses on intra-group impression formation. One exception is Otten and Moskowitz (2000), who used a minimal group paradigm to investigate whether mere group membership facilitated or inhibited spontaneous trait inferences. They found evidence of ingroup favoritism, such that positive spontaneous trait inferences were facilitated for ingroup members' behaviors, though they did not find evidence for outgroup derogation (no facilitation of negative spontaneous trait inferences for outgroup members' behaviors). Their findings indicate that the motivations based in social group memberships could facilitate or inhibit spontaneous trait inferences. Yet, to date, we are aware of no research that considers how impression formation processes in cross-race situations. Perhaps outgroup derogation in spontaneous trait inference formation would occur within an interracial context, in particular for stereotype-consistent spontaneous trait inferences. Furthermore, consideration of interracial impression formation raises interesting questions with respect to other types of social motivations, such as motivation to be non-prejudiced (Plant & Devine, 1998; Moskowitz & Li, 2011) or motivation to maintain or reinforce group stereotypes (Oldmeadow & Fiske, 2007). However, we propose that intergroup considerations pose many interesting and currently unanswered questions for the processing of behavioral information.

For instance, imagine a scenario where a White perceiver, Elizabeth, is forming an impression of her new co-worker, Tyrone, who is a Black man. It is personally important to Elizabeth that she is non-prejudiced (Plant & Devine, 1998). In his first days at work, Tyrone submits an assignment to the supervisor where he clearly misunderstood the instructions. Does Elizabeth make a spontaneous trait inference about Tyrone, concluding that he is incompetent? In

this case, Elizabeth's egalitarian motives may disrupt classic spontaneous trait inference processes and result in more deliberative processing of the behavioral information, consistent with Gilbert et al.'s (1988) model described earlier. Whereas past research has shown that dispositional (chronic) goals can impact the likelihood of spontaneous trait inference formation (Uleman et al., 1986), another possibility has not yet been addressed. Specifically, Elizabeth's motives could change the nature of the spontaneous inference made, perhaps facilitating a *spontaneous situational inference* (e.g., others did not clearly explain expectations). Current goals could either inhibit a correspondent spontaneous trait inference or facilitate other, more goal-congruent spontaneous inferences. Finally, Elizabeth may still form stereotype-consistent spontaneous trait inferences that may or may not be overridden by deliberative processing. Whether correction occurs may depend on other factors such as the extent to which Tyrone otherwise fits the prototype of a Black man in Elizabeth's mind (e.g., Maddox, 2004). This example illustrates the sudden relevance of group-based motivations to impression formation processes once the interaction moves from same-race to cross-race contexts. It also highlights the understudied and complicated interaction of perceiver motives, behavior type, and target factors influencing person perception.

Continuing the example in the other direction, Tyrone's stereotypes about White people and whether they are to be trusted (Major et al., 2016) may influence his impressions of Elizabeth. If she behaves in a friendly manner toward him, Tyrone could make the correspondent spontaneous trait inference—that she's a friendly person—or that she is just trying to appear non-prejudiced to him and other co-workers. Seminal research by Crocker, Voelkl, Testa, and Major (1991) suggests that Tyrone will not infer that Elizabeth is a friendly person and instead

will experience a drop in self-esteem because he attributes her behavior to the external motivation to appear non-prejudiced. However, those researchers were examining the affective consequences of explicit attributions, whereas we are interested in the role of stereotypic beliefs on spontaneous trait inferences. *We know of no research that has investigated whether and under what conditions perceivers of color make spontaneous trait inferences about White targets*, let alone examine the role of stereotypic beliefs or motivations that could shape people of color's impressions of White individuals. Because research suggests that suspicion of ulterior motives disrupts spontaneous trait inferences (Fein, 1996), it may be that perceivers of color who associate White people with disingenuity may resist forming spontaneous trait inferences about White targets broadly.

In sum, the racial stereotypes and race-based motivations of perceivers could play important roles in shaping cross-race impression formation, and especially the likelihood of spontaneous trait inference formation. Here the predictions will depend not only on who the target is, but also on the valence of the trait-implying behavior, and the social motivation of the perceiver.

Expanding Participant Populations

One exception to the dearth of research on perceivers of color in the person perception literature is research examining cross-cultural variability on the inference and attribution processes (e.g., Choi & Nisbett, 1998; Masuda & Kitayama, 2004; Miyamoto & Kitayama, 2002). Early research in this area showed that East Asian perceivers are less likely to form trait inferences from trait-implying behavior, in part due to increased attention to the context as a

causal force on targets' behaviors. Notably, Jim Uleman has been involved in conducting cross-cultural research in spontaneous trait inference formation for decades (Rhee, Uleman, Lee, & Roman, 1995; Rhee, Uleman, & Lee, 1996; see also Na & Kitayama, 2011) and has continued these efforts throughout his career. Uleman's recent work with colleagues Yuki Shimizu and Hajin Lee demonstrates a recognition of this need to examine spontaneous trait inferences through a lens other than that of undergraduate students in the US forming impressions of White male targets. Shimizu et al. (2017), for example, compared the responses of US American and Japanese undergraduates, and found that Japanese participants made fewer spontaneous trait inferences, and that their responses were driven less by automatic processing, compared to their US American counterparts (see also Lee et al., 2015, 2017). More recently, Shimizu and Uleman (2021) replicated the finding that White American participants generated more spontaneous trait inferences than both Japanese participants and Asian American participants and used eye-tracking analysis to provide evidence for cultural differences in attention allocation as a mediator of cultural variation in spontaneous trait inference.

While Uleman's efforts to diversify the spontaneous trait inference literature are admirable, much more research is needed. Although some recent studies have endeavored to determine the global generalizability of *face-based* trait inferences (Jones et al., 2021), we believe that focused experimental work with more racially diverse samples is also needed. As developed in the previous section, examining cross-race spontaneous trait inference formation will provide a more comprehensive understanding of the role of perceiver factors, target factors, and their interactive effects on person perception.

Methodological Traditions and Opportunities

A hallmark of spontaneous trait inference research, and Jim's legacy, is methodological rigor (e.g., Winter & Uleman, 1984). Researchers create new stimulus sentences of behaviors that could imply traits (e.g., "Sean slipped money into his wife's purse") that are carefully pretested to ensure that they reliably imply a trait (e.g., "generous") among the sample population. Furthermore, researchers have made sure that the implied trait words are not contained, in any form, within the sentence itself. Probe words used in experiments are frequently examined so that they are not too unique or pedantic (e.g., "benevolent" is a less ideal probe word than "generous"). Within an experiment, sentences must imply unique traits (not implying the same trait multiple times, as this would obscure spontaneous trait inference formation about a particular target) and there is always a balance between positive and negative traits implied. Meticulous attention to methodological detail is a hallmark of the spontaneous trait inference tradition.

Explore Behavior Ambiguity. Now that the spontaneous trait inference process has been firmly established, it is time to re-evaluate the methods that have become standard practice in this research area. We observe that, in the previously described approach, any ambiguity is essentially pre-tested out of the stimuli. Behaviors can be ambiguous with respect to their implications; sometimes a behavior could be potentially friendly or unfriendly depending on numerous factors (e.g., the classic "Donald" paragraph featuring ambiguously hostile behaviors; Srull & Wyer, 1979; see also McCarthy et al., 2018, 2021). Because Uleman et al.'s original research was aimed at establishing that spontaneous trait inferences occur, it became paradigmatic to focus on clearly trait-implying behaviors. Yet ambiguity can be a researcher's

tool in trying to understand the underlying process. For example, using ambiguous behaviors could clarify the person- and situation-based factors that lead to spontaneous trait inferences based on ambiguous behaviors. Using behaviors that “strongly” implied traits, Moskowitz (1993) found that people who are high in the personal need for structure were more likely to use spontaneous trait inferences. Relatedly, Okten and Moskowitz (2020) found that political conservatives, who are more motivated to seek consistency, were more likely to form spontaneous trait inferences than political liberals (see also Okten & Moskowitz, 2018). Yet, since Moskowitz’s and Okten’s contributions, there has been limited follow-up research on the dispositional factors that can influence the strength of spontaneous trait inference formation. It is possible that researchers who have sought to follow up on individual variability in spontaneous trait inference formation have found null person-by-situation interactions when using strong trait-behavior stimuli. We speculate that the lack of ambiguity in spontaneous trait inference sentences may decrease the chances of finding effects of individual difference characteristics.

Explore Target Appearance Variability. Moving away from clearly trait-implying behaviors enacted by White targets (the predominant spontaneous trait inference paradigm) has the capacity to move the field forward in other ways. The usefulness of stimulus variability has recently been harnessed in the growing literature on face perception and judgment. For example, a person can also be racially ambiguous, in that their particular racial group membership is difficult to discern (Chen & Hamilton, 2012) or not consensually agreed upon by others (Chen et al., 2018). The use of racially ambiguous faces has clarified a number of interesting top-down and bottom-up processes involved in the racial categorization process (e.g., Chen et al., 2014; Freeman et al., 2011; Johnson et al., 2012). In addition, an overlooked aspect of racial bias

concerns within-race variation on race-related cues among unambiguous targets. When considering physical appearance, racial phenotypicality bias reflects a tendency to use within-race variation in facial appearance to guide judgments and behavior (Maddox, 2004). For example, Blacks are stereotypically thought to have dark skin tone, broad noses, full lips, and tightly curled hair. Research exploring within-race variation on these features contends that, across a variety of domains, Blacks with more stereotypical appearance are more closely associated with category stereotypes (Hinzman & Maddox, 2017; Maddox & Gray, 2002) and have poorer societal outcomes compared to their less stereotypical counterparts (for reviews, see Adams, Kurtz-Costes, & Hoffman, 2016; Maddox, 2004, Maddox & Dukes, 2008).

Consequently, we believe that these approaches exploring racial phenotypicality and ambiguity could be fruitful for understanding perceptions of behaviors and spontaneous trait inference formation, particularly when coupled with manipulations of behavior ambiguity and stereotypicality. Racial phenotypicality and racial ambiguity reflect the strength of association between a target's appearance and a potential racial categorization. As such, these cues have the potential to constrain or facilitate the formation of spontaneous trait inferences depending on the ambiguity and stereotypicality of the behavior. For example, an ambiguously aggressive behavior could elicit increasingly stronger trait inferences when performed by a racially ambiguous, low-, or high-phenotypically Black person. Likewise, behavior ambiguity and stereotypicality may constrain or facilitate target categorization depending on facial ambiguity and phenotypicality. A Black-White racially ambiguous person who excels in athletics might be categorized as Black instead of as White, whereas another ambiguous person who excels in academics might be seen as more White than Black. This kind of spontaneous trait inference

work could contribute to our understanding of stereotype change by influencing the likelihood that counterstereotypic behavioral information is associated with an individual and generalize to inferences about the group (e.g., Hinzman & Maddox, 2017; Maurer, Part, & Rothbart, 1995).

These examples illustrate the potential interplay between social category and behavioral information that we believe is ripe for future research. However, in order for the proposed work to occur, researchers will need to draw on large sets of racially diverse stimuli. Fortunately, in recent years, the number of faces of various different races, including ambiguous faces, has grown substantially, in large part due to the Chicago Face Database and the American Multiracial Faces Database (Chen et al. 2020; Ma et al., 2015, 2021). With these stimulus sets, in combination with published spontaneous trait inference behavioral stimuli, it will be possible for researchers to examine how racial stereotypes and motivations shape impression formation.

Diversifying the Researchers

Scholars of color are drawn to topics that enable them to study intergroup disparities, and the spontaneous trait inference literature could do more to integrate the kinds of questions that interest scholars of color. As we have already noted, the methodological strength of the existing spontaneous trait inference literature—its use of carefully controlled stimuli—might also be an impediment to future progress in developing a more nuanced understanding of behavior-based impression formation. The spontaneous trait inference literature might better be described in less general terms: as a literature documenting behavior-based impressions of White targets, or targets assumed to be White, engaging in unambiguous behavior.

Early research on spontaneous trait inferences used behavioral descriptions without photos of the actor. Although this work did not explicitly narrow its focus to White targets, plenty of research has documented that perceivers assume that a person is White (and male) when their race and gender are unspecified (see Bailey et al., 2020; Smith & Zarate, 1992; Stroessner, 1996). Once the paradigms incorporated faces, many studies focused exclusively on White male targets for the sake of experimental control (e.g., Hamilton et al., 2015), and others did not specify the demographic composition of their stimuli (a serious methodological oversight, in our opinion).

Of course, not all the spontaneous trait inference literature focuses on White male targets, but when preponderance of evidence seems to imply or describe a particular type of target, scholars who do not see themselves as represented in the research—or in the community of scholars conducting that research—might reasonably assume that the topic is irrelevant to them. And yet, we know that developing comprehensive accounts of psychological phenomena requires a diversity of perspectives, questions, and methods—and what better way to achieve that than by setting up the conditions to encourage scholars of diverse backgrounds to join the community?

To that end, we advocate for researchers in the spontaneous trait inference tradition to not only diversify their stimuli but also to actively engage with scholars of color. We are calling for an expansion of the indigenous psychology approach (Allwood & Berry, 2006; Berry & Kim, 1993) to include not only broad cultures and language, but also to recognize the critical importance of differences in lived experiences even within cultures. Indigenous psychology elevates the knowledge and beliefs that people have about themselves and their experiences as

starting points for inquiry. To the extent that the diverging lived experiences of scholars of color and White scholars promote different perspectives on how to interpret behavior, bringing more scholars of color into the spontaneous trait inference research community will facilitate new discoveries about the mechanisms by which behavioral inference shapes impressions (see also, Ledgerwood et al., 2020; 2021).

On a final, personal note, we believe that diversifying the researchers is not solely driven by the content of the research. Author KM, an African American man, met Jim Uleman as an advanced graduate student in 1996 while attending the Society for Experimental Social Psychology (SESP) Conference. Even though Blacks and members of other racial and ethnic minorities were severely underrepresented at the conference, I will always remember that SESP as the time, early in my career, that I started to feel a part of the field. This was in large part due to Jim. We were among a large group of primarily senior faculty members who went out for dinner at a restaurant. KM sat next to Jim the entire evening chatting one-on-one at times, and in the larger group. Jim showed genuine interest in me and in my work that was at times intimidating, but also comforting and validating. As a graduate student, I had some concerns about keeping the bill manageable but ultimately decided not to worry too much about it. But for those of us who have been in that situation with little disposable income, it's hard not to be a little preoccupied throughout the evening before the arrival of the check. And as the only person of color in the group, this preoccupation was even more intense as I considered the negative lens through which others might see me were I to speak out, balanced with the financial implications if I didn't. When the moment arrived and the check finally came, the dreaded recommendation to split the bill evenly among our party was announced. Instead, Jim suggested that the faculty split

the bill and buy dinner for the graduate students. I will never forget that he did that, and the tremendous relief from the burden that I felt. Reflecting on that time, my concerns may have been exaggerated in my mind, but at the time I lacked that perspective. Since then, I've tried to do the same, whenever possible, for others who might have similar concerns in these situations like that one. But *before* we order, and with explicit reference to the kind of rumination I experienced back then. Doing so makes explicit my understanding of their potential concerns and takes a bit of the edge off a potentially threatening experience.

Conclusion

There are several structural and interpersonal barriers to the inclusion and representation of underrepresented minority scholars in social cognition that we absolutely must address to fulfill the promise of a broad and generalization theory of human thought and behavior (Ledgerwood et al, 2021). Awareness of these challenges and good intentions to enact change are not enough. We need scholars who will channel awareness into urgency, urgency into intent, and intent into action. However, we believe that diversifying the field would be a little bit easier with more inquisitive, clever, thoughtful, and compassionate scholars like Jim in it.

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