**The Stigmatized Perceiver: Exploring the Implications of Social Stigma for Cross-Race
Face Processing and Memory**

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Abstract

The human face is an important source of information, such as race or ethnicity, that can guide social interaction and outcomes. Research suggests that compared to majority and dominant group members, minority and subordinate group members tend to experience chronic stigma, resulting in more negative life outcomes (e.g., educational and occupational attainment). We argue that theory and research exploring face perception has not led to models that incorporate how the chronic experience of stigma may impact judgments, reflecting a gap with potential consequences for the validity and generalizability of the theories developed. We propose a framework for understanding how experiencing a socially stigmatized racial identity may lead perceivers to engage in face processing differently from their non-stigmatized counterparts. With a focus on the literature examining the cross-race effect, we explore the potential impact of chronic social stigma on three theorized moderators guiding processing and memory for same- versus cross-race faces. Our analysis suggests that future research focusing on stigmatized perceivers could help to explain some variation in findings, lead to novel theoretical development, and ultimately produce more generalizable research across several domains of inquiry.

The Stigmatized Perceiver: Exploring the Implications of Social Stigma for Cross-Race Face Processing and Memory

Perceivers glean a wealth of meaningful information when viewing a face; faces provide insight into emotions, intents, identity, and even stable target personality differences (e.g., Todorov, Olivola, Dotsch, & Mende-Siedlecki, 2015). Infants as young as 30 minutes old will display greater attention to faces than other stimuli (controlling for contrast, complexity and spatial frequency; Johnson et al., 1991) and people are able to make inferences of personality, emotion, group membership, and sexuality automatically, and sometimes accurately, from faces (Todorov et al., 2015; Rule, Macrae, & Ambady, 2009). Perceivers can also readily extract social category information from faces; social neuroscience researchers have demonstrated that information about basic social category membership like race, sex, and age are available within the first hundreds of milliseconds of encountering a face (Ito & Urland, 2003; Macrae & Bodenhausen, 2000), and that these category memberships inform subsequent face processing (Hugenberg & Corneille, 2009). Thus, face perception informs interactions between dyads and groups, with the potential to create and maintain societal disparities across a wide range of domains (e.g., healthcare, education, hiring practices, voting decisions, sentencing decisions; e.g., Mende-Siedlecki et al., 2019; Todorov et al., 2005; Wilson & Rule, 2015). For example, Wilson and Rule provide evidence that stable facial characteristics (i.e., trustworthiness) can influence criminal justice decisions - including death-penalty determinations. In addition to facial characteristics, Mende-Siedlecki and colleagues (2019) offer evidence that the way in

which perceivers *process* faces might also contribute to meaningful public health disparities, in this case, racial biases in pain care.

While these face processing findings are often assumed generalizable to all, some people possess identities that are minoritized and stigmatized – socially devalued – with implications for their functioning and outcomes in society (Link & Phelan, 2001; Major & O’Brien, 2005). Unfortunately, few models or studies explore the extent to which a perceiver’s group identity, particularly stigmatized identity, influences face perception processes. Even when group identity is examined, the findings often diverge from those studies focused on non-stigmatized, majority perceivers and the theories that guide that work (discussed further below). With a focus on research exploring face memory, we propose a novel framework for understanding how experiencing a socially stigmatized minority racial identity may lead perceivers to engage processes guiding face perception differently from their non-stigmatized counterparts. We extend the implications of this work to consider consequences beyond face-memory to other impression formation phenomena and propose empirical directions to provide a more comprehensive theoretical approach to face processing that considers the role of identity stigmatization.

Face Processing and Social Stigma

Across both the psychological and biological sciences, face processing is often described as special, unique, or dedicated; humans (and non-human primates) process and mentally represent faces differently than other visual stimuli (Farah, Wilson, Drain, & Tanaka, 1998; Maurer, Le Grand, & Mondloch, 2002; Yin, 1969). Given the importance of faces as social stimuli

and their relevance to success in numerous impactful domains (e.g., friendship, mating, threat detection) it makes a great deal of sense that humans may have developed specialized or unique processing for faces. Although most objects of visual perception are processed on the basis of their individual components in relative isolation of each other (referred to as *attribute* or *featural* processing), the face is unique in that it is often processed as a gestalt, rather than as a series of additive parts (referred to as *holistic processing*; Avidan, Tanzer, & Behrmann, 2011; Farah, Levinson, & Klein, 1995; Farah, Wilson, Drain, & Tanaka, 1995; Kanwisher, Tong, & Nakayama, 1998; Richler, Cheung, & Gauthier, 2011a). Put differently, instead of seeing two eyes, a nose, and a mouth, we see a face. Related to holistic processing, *configural processing* reflects sensitivity to the interrelationships between different facial features, such as the shape and position of the nose, mouth, and eyes (Carey & Diamond, 1977). Thus, featural processing may lead one to see that two faces have the same eye color, but holistic and configural processing may lead to recognition that in concert with another feature, like nose shape, these faces represent two distinct identities.

The Thatcher Illusion (Thompson, 1980) is a well known visual illusion commonly used to illustrate the role of holistic and configural versus featural processing in faces. This visual illusion inverts features (eyes and mouth) and the whole of the face orthogonally. Of critical comparison, orientation mismatch between features and the whole face is less noticeable when the whole face is inverted as opposed to upright. This difference is attributed, in part, to differences in face processing approaches used for upright and inverted faces. Featural processing is theorized to dominate when the face is inverted (indeed, inversion is commonly

employed as a manipulation in social and cognitive science to disrupt configural processing; e.g., Hugenberg et al., 2016; Leder et al., 2001). However, when the face is upright and configural processing is not disrupted, the manipulated features become much more apparent, even disturbing. To demonstrate this illusion and the workings of configural and holistic processing, Figure 1 depicts the authors' faces (two White women and one Black male) subjected to the Thatcher manipulation. Although recent work suggests the entanglement of configural processing and the Thatcher illusion is more complex than described here (e.g., de Haas & Schwarzkopf, 2018; Donnelly et al., 2012; Psalta et al., 2014), this example offers a simplified but experiential glimpse into the face processing styles discussed for non-expert audiences.

Configural processing of faces has received so much attention because it is believed to be a unique precursor to many important social processes. For example, prior research has demonstrated that disrupting configural processing can impact perception and memory of faces more so than non-face stimuli (e.g., Farah et al., 1998; Maurer et al., 2002). For this and other reasons, psychological researchers from cognitive, social, and vision subdisciplines have explored the factors that influence use of holistic and configural face processing and the consequences of face processing style in social interaction. For instance, configural face processing appears to underlie accurate emotion recognition (Calder & Jansen, 2005; Calder & Young, 2005; Calder, Young, Keane, & Dean, 2000; Cañadas, Lupiáñez, Kawakami, Niedenthal, & Rodríguez-Bailón, 2016), and disruptions to configural processing are associated with dehumanization of novel others (Hugenberg et al., 2016).

Figure 1. Illustration of the Thatcher Illusion and face processing styles.

Perhaps, depending on the reader's own racial identity, you may have noticed the Thatcher Illusion more starkly for a subset of the authors' faces depicted in Figure 1. An emerging body of work suggests that social category information influences face processing (Fincher & Tetlock, 2016; Kelly, Quinn, Slater, Lee, Ge, & Pascalis, 2007; Michel, Rossion, Han, Chung, & Caldara, 2006; Van Bavel, Packer, & Cunningham, 2011); thus, despite evidence that faces are privileged in visual perception, not all faces equally benefit from this specialized processing. For example, past research suggests White participants, in particular, process the faces of racial outgroup individuals less configurally, but more featurally than racial ingroup faces (Michel, Rossion, Han, Chung, and Caldara, 2006; Tanaka Kiefer, & Bukach, 2004). In short, faces of racial outgroup members appear to be processed less like faces and more like non-face objects. Further, these processing deficits -- demonstrated largely among White perceiver samples viewing outgroup and minority group member faces -- have been linked with reduced individuation (consideration of person's unique qualities) resulting in poorer emotion recognition (Young, & Hugenberg, 2010), decreased perceived trustworthiness (Wilson, Young, Rule, & Hugenberg, 2018), greater reliance on stereotype information (Wilson et al., 2018), increased dehumanization (Hugenberg et al., 2016), greater prejudice (Schmid & Amodio, 2016), and poorer face memory (Richler, Cheung, & Gauthier, 2011a; Richler, Cheung, & Gauthier, 2011b; Rhodes, Brake, Taylor, & Tan, 1989).

Most of this research has been devoted to understanding how altering the race of the target of perception can influence the extent to which racial majority (e.g., White) perceivers engage in holistic and configural versus featural processing of same- and cross-race targets (e.g.,

White versus Black faces). An empirical and theoretical focus on the perspectives of racial majority perceivers overlooks the multiply determined nature of interracial relations. While racial minority individuals are often framed as the targets of perception and judgment (Major & O'Brien, 2005), they are not just targets, but also perceivers (often stigmatized) with unique experiences who actively process and act on information gleaned from the social world.

We propose a framework for understanding how experiencing a socially stigmatized racial identity may lead perceivers to engage in face processing differently from their non-stigmatized, White, counterparts. To center this work, we focus on face memory because it is an outcome that depends on face processing style, whereby greater holistic and configural face processing elicits better novel face memory (Richler, Cheung, & Gauthier, 2011a; Richler, Cheung, & Gauthier, 2011b; c.f., Konar, Bennett, & Sekuler, 2010). Additionally, with some exceptions (e.g., Kunstman, Tuscherer, Trawalter, & Lloyd, 2016), research in this area mirrors the broader face-processing field's focus on majority perceivers. We first briefly review evidence for the cross-race effect (CRE) in face memory and articulate the theorized role of face processing styles in race-based face memory deficits. Next, we identify several theorized predictors of face processing style and accurate face memory affected by social stigma. Finally, we review several opportunities for future research comparing stigmatized versus non-stigmatized perceivers in the context of face memory, as well as for its antecedent processes and downstream consequences.

Face Memory: The Cross-Race Effect

The CRE (sometimes termed the own-race effect or cross-race deficit), by which same-race faces are better recognized than cross-race faces, is among the most robust and replicable phenomena in face perception (Meissner & Brigham, 2001; Singh et al., 2021). In a typical CRE paradigm, perceivers are shown faces of same-race and cross-race target individuals and asked to remember the faces shown. Later (usually after a distractor task), participants are tested on their memory. In this test phase, participants view previously shown faces but also novel faces. Participants must decide whether each face is “new” or “old.” The signal detection sensitivity metric d' is typically used to calculate participants' ability to discriminate between new and old faces for same-race and cross-race targets.

The majority of work employing this paradigm has recruited White participants and employed White and Black target faces. White perceivers tend to show greater face memory (ability to discriminate between new and old faces) for White than for Black targets (for meta-analysis Meissner & Brigham, 2001). Some investigations have employed this paradigm to investigate face memory among White *and* non-White perceivers, with mixed findings. While some work consistently demonstrates the CRE across perceiver race (e.g., Pauker, Ambady, & Freeman, 2013; Pauker, Weisbuch, Ambady, Sommers, Adams & Ivcevic, 2009; Vingilis-Jaremko, Kawakami, & Friesen, 2020), this well-known phenomenon is sometimes attenuated, eliminated, or even reversed among minority group perceivers (e.g., Havard, Memon, & Humphries, 2017; Meissner & Brigham, 2001; Sangrigoli, Pallier, Argenti, Ventureyra, & Schonen, 2005; Wright, Boyd, & Tredoux, 2003). In other words, when considering non-White

perceivers viewing same- and cross-race faces, findings are inconsistent. In their 2001 meta-analytic review, Meissner and Brigham demonstrate effect size differences in the Black-White CRE across perceiver populations, with White participants ($g^U = 1.06$) demonstrating a larger CRE than Black participants ($g^U = .66$). Although both effects are large in size, this difference in effect size indicates potential for meaningful variability. Similarly, in an examination of same-race biases in child and adolescent eye-witness testimony, Caucasian British children showed evidence of a CRE with greater false identifications for cross-race relative to same-race targets; however, Asian British children showed no such effect, performing equally accurately for same- and cross-race targets (Havard et al., 2017). Two additional studies observed reversals of the CRE for minority group perceivers. Korean adoptees raised by White European parents living in Europe showed better memory for Caucasian faces than Asian faces: even matching the performance of a White control group (Sangrigoli et al., 2005). Similarly, Black South Africans demonstrated superior memory for White targets compared to Black targets (Wright, Boyd, & Tredoux, 2003). Thus, the CRE may be attenuated or operate differently among non-White or minority groups participants - a possibility considered in the current article.

The Categorization-Individuation Model

Given that the CRE has been of interest to psychologists for more nearly 70 years, it is not surprising that researchers have developed strong theoretical positions on the mechanisms underlying this effect (e.g., perceptual expertise models, social cognitive theories, representational models, differential processing models; for review see Young, Hugenberg,

Bernstein, & Sacco, 2012). Although detailed discussion of these models is outside the scope of the current work, we frame our current arguments with reference to one: the Categorization-Individuation Model (CIM; Hugenberg, Young, Bernstein, & Sacco, 2010). The CIM integrates earlier *perceptual learning models*, focused on differential expertise as the primary determinant of the CRE, and *social cognitive theories* focused on differential categorization processes yielding differential attention deployment and processing of same- and cross-race faces. The CIM posits that person perception can occur at two different levels or foci: categorization or individuation (Brewer, 1988; Fiske & Neuberg, 1990; Macrae & Quadflieg, 2010). Categorization refers to an attentional focus on shared characteristics of a group (e.g., race diagnostic information), whereas individuation refers to a focus on characteristics that distinguish the target of perception from others (i.e., identity diagnostic information). The CRE is theorized to result from greater relative categorization of racial outgroup members thus impairing memory for a cross-race target's identity, and greater relative individuation of racial ingroup members thus improving memory for a same-race target's identity.

These categorization-individuation foci are complementary to the featural and holistic/configural face processing styles discussed previously. Indeed, categorization requires relatively more perceiver attention to target features that communicate race diagnostic information (e.g., hair texture, skin tone, nose width; Kawakami et al., 2014; Tanaka & Sengco, 1997), whereas individuation requires more attention to the configuration of those features, which may distinguish that target from others (e.g., Hugenberg & Sacco, 2008; Wong, Palmeri, & Gauthier, 2009). As noted previously, processing style has been implicated in successful face

memory, with greater holistic and configural face processing eliciting better memory for unique face identities (Richler, Cheung, & Gauthier, 2011a; Richler, Cheung, & Gauthier, 2011b; c.f., Konar, Bennett, & Sekuler, 2010). It is important to note that although numerous researchers argue that configural face processing underlies the CRE, causal evidence is lacking; some work fails to document differences in holistic or configural processing across same and cross-race others (Bukach et al., 2012; Harrison et al., 2014) and other work suggests processing differences are not predictive of the CRE (Harrison et al., 2014; Horry et al., 2015).

In addition to articulating roles of categorization and individuation in face memory, the CIM identifies predictors of categorization and individuation including: perceiver motivation (i.e., perceivers will only individuate faces deemed sufficiently worthy of their limited attention) and perceiver expertise (i.e., high-quality experience discriminating among same-race than cross-race faces). These factors enable a more nuanced perspective on the CRE, considering individual differences and situational factors that moderate the CRE. Thus, the CIM represents a well-constructed and generative model of how perceivers represent and remember the faces of ingroup and outgroup members.

In addition to the CIM, at least one other prominent model of face perception (Correll, Hudson, Guillermo, & Earls, 2017) explicitly recognizes the role that racial identity may play in producing the CRE, but each of these models are also largely built upon research focused on the perceptions of majority populations. These theories are excellent models of how mostly White participants form impressions of others, but less is known about the extent to which these theories generalize to racial minorities. This is also true to a large extent of classic and

contemporary research exploring impression formation; and psychology more generally (Henrich, Heine, and Norenzayan, 2010; Roberts, Bareket-Shavit, Dollins, Goldie, and Mortenson, 2020).

The current work leverages and extends the CIM framework to describe some potential effects of individual differences and situational factors, overlapping with perceiver race, related to three moderators of the CRE: expertise, motivation, and cognitive resources. This analysis generates unique considerations and hypotheses for stigmatized perceivers.

The Stigmatized Perceiver: Face Processing, Memory, and Social Stigma

Due to their focus on majority perspectives, the face processing and face memory literatures have focused largely on how a *target's* attributes, and specifically racial group membership, can influence face processing strategies employed by the *perceiver*. By contrast, previous research has less thoroughly examined how a *perceiver's* group membership may also influence face perception processes with implications for memory. Indeed, previous research indicates psychological consequences of discrimination, unstable or limited access to resources, and low-status or power on attentional deployment and motivated processes, but this literature is rarely used to explore face processing. For example, experiences of discrimination may leave individuals vigilant of social identity threats or cues to discrimination in the future (Kaiser et al., 2006; Kunstman et al., 2016), and a lack of resources or power may compel or direct attention and motivated processes “upwards” towards those non-stigmatized individuals who control the resources and power within their environment (Link & Phelan, 2001). Moreover, numerically speaking, minority group members often interact more frequently with

majority group members than vice versa (e.g., it may be relatively easy for White individuals to avoid interactions with racial minority group members while such avoidance may be less feasible for racial minority group members in majority White environments or contexts).

Importantly, as noted above, these experiential, affective, and cognitive factors influenced by status and group membership are also implicated in face processing and memory (Young et al., 2012). For these reasons, the way in which cross-race faces are processed and remembered by majority/dominant group members and stigmatized/minoritized individuals may diverge. That is, low-status groups in society often experience stigma, which may carry consequences for cognitive and affective processes that play a role in maintaining group disparities beyond the influences well-documented among majority or high-status group members (Link & Phelan, 2001; Major & O'Brien, 2005). Thus greater attention to perceiver experience and particularly the role of stigma in informing group-based face perception and memory is practically valuable and theoretically warranted.

We argue that being a member of a stigmatized racial group has relatively unexplored implications for several domains related in face processing and memory, specifically: 1) experiences with cross-race others, 2) the motivational relevance of cross-race others, and 3) the availability of cognitive resource when perceiving cross-race others. These factors differently impact (or are impacted by) the psychological states of stigmatized individuals with implications for the way stigmatized individuals engage in face processing and thereby face memory during social interactions. Our approach leverages the CIM which implicates expertise and motivation as predictors of accurate face memory, but also extends this model to propose the availability of

cognitive resources as a potential determinant of face memory outcomes. Thus, we propose a shift from a *stigmatized target* perspective to a *stigmatized perceiver* perspective by reviewing the psychological consequences of stigma that have relevance to face processing and memory.

Below we identify expertise, motivation, and cognitive resources as predictors of same- and cross-race face processing style and accurate face memory (see Table 1). Within each factor, we integrate literature on stigmatization and identity with face memory to consider how experiencing social stigma influences expertise, motivation, and cognitive resources, respectively, and the resulting consequences for face processing and memory. We conclude that consideration of these factors yields distinct predictions for stigmatized versus dominant group members. These distinct predictions aid in explaining variation in race-based face memory effects among minority stigmatized perceivers and call for greater consideration of perceiver identity in the face processing literature.

In our analysis, we describe hypothesized patterns of expertise, motivation, and cognitive resources that represent default/baseline psychological states comparing stigmatized minority and non-stigmatized majority perceivers. However, we offer two caveats that we will address in a later section on future directions. The first is that not all stigmatized perceivers necessarily share the same minority/majority relationship with a potential target face (e.g., both perceivers and targets are stigmatized minorities). The second is that the experience of chronic stigma may be associated with the development of short- and long-term coping strategies (Barreto, 2014) that may lead to variation in the effects of these moderators within stigmatized perceivers.

Table 1. Moderator Impacts on Cross-Race (CR) Face Memory as a Function of Perceiver Stigma.

<u>Moderator</u>	<u>Perceiver Social Identity Relative to Target</u>			
	<u>Lower Stigma</u>		<u>Higher Stigma</u>	
	<u>Baseline State Relative to Target</u>	<u>Impact on CR Memory</u>	<u>Baseline State Relative to Target</u>	<u>Impact on CR Memory</u>
Expertise	Lower	Inhibit	Higher	Facilitate
Motivation	Lower	Inhibit	Higher	Facilitate
Cognitive Resources	Higher	Facilitate	Lower	Inhibit

Note: Perceiver social identity reflects the level of relative stigmatization (lower or higher) as compared to the social identity of the target face. Baseline and Impact reflect the default perceiver status for each moderator and the proposed impact on cross-race face memory, respectively.

Potential Effects of Stigma on Face Processing and Memory

Expertise

The CIM, as well as numerous other models of face memory, argue that the lack of expertise or experience in discriminating amongst cross-race individuals is a central determinant of the CRE (Hugenberg, Young, Bernstein, & Sacco, 2010; Michel, Rossion, Han, Chung, & Caldara, 2006; Rhodes, Brake, Taylor, & Tan, 1989). Perceivers (at least non-stigmatized perceivers who have been the focus of existing research) commonly have more high-quality experience discriminating among same-race than cross-race faces, and face memory theorists have argued that differential experience with same-race versus cross-race faces yields different

processing styles and patterns of attentional deployment (Rhodes et al., 1989; Michel et al., 2006; Tanaka et al., 2004) – even in infancy (e.g., Kelly, Quinn, Slater, Lee, Ge, & Pascalis, 2007). To this point, the level of perceptual expertise that a perceiver has with an object of perception predicts the degree to which the perceiver will engage configural processing. A perceiver gains perceptual expertise as they have more experience distinguishing unique individual members of a given category. For example, Bukach and colleagues (2012) provide evidence that greater self-report individuating experience corresponds with less same-race versus cross-race difference in holistic processing. Further, this pattern of results is consistent across Black and White perceivers. This theorized role of expertise in configural and holistic processing has been directly tested by training methodologies whereby participants are trained to develop expertise for individuating or categorizing non-face objects (Gauthier & Tarr, 2002; Richler, Wong, & Gauthier, 2011; Wong et al., 2009). As participants gained more experience discriminating amongst a novel class of objects, they also demonstrated higher rates of configural processing for that novel class of objects. Note, however, that memory for individual objects was not an empirical focus of this work.

Cross-cultural examinations of the CRE lend support to the notion that a lack of experience perceiving faces from a given social category predicts poorer memory (Michel, Corneille, & Rossion, 2007; Michel et al., 2006; Tanaka, Kiefer, & Bukach, 2004). More direct support comes from studies examining the CRE among those with varied exposure to cross-race others. Meta-analytically the CRE is negatively associated with cross-race contact; Meissner & Brigham (2001) report a correlation of $r = -.13$ and Singh and colleagues (2021) report a

correlation of $r = -.18$. Taken together, expertise in discriminating among faces of a given race may predict the extent to which a perceiver will use configural processing and thereby demonstrate more accurate recall.

Stigma, expertise, and face memory. To examine the role that expertise plays in guiding face processing and memory for stigmatized perceivers we can consider how the contexts within which stigmatization occurs are related to acquisition of experience with same- and cross-race face discrimination. For instance, as minority populations in many countries, racially stigmatized perceivers are likely to have more experience interacting with cross-race individuals than non-stigmatized perceivers. Therefore, we might expect that stigmatized perceivers have more opportunity to develop the perceptual expertise that leads to increased rates of configural face processing for non-stigmatized racial groups (Hugenberg et al., 2010; Correll et al., 2017). Indeed, Rhodes and colleagues (2009) demonstrated that time spent in Australia negatively predicted the size of the CRE among ethnically Chinese individuals – but only for configural (whole face) and not featural (scrambled face) memory tasks.

As an illustration of this supposition's practical consequences, Havard and colleagues (2017) recruited Caucasian and Asian British children and adolescents to engage in a line-up identification task. Caucasian children and adolescents showed evidence for the CRE with more correct identifications of White culprits and more false identifications of Asian culprits; however, no such effects emerged for Asian participants. Moreover, Asian participants had significantly greater cross-race exposure than White participants and consistent with the role of expertise in face-memory, cross-race contact correlated with correct identification of cross-race

faces in the line-up task. This analysis suggests that stigmatized minority perceivers are perhaps likely to develop expertise for majority cross-race faces with implications for face memory.

Although cross-race contact is an important precursor for the development of cross-race expertise, mere contact may not be sufficient for promoting cross-race identification (e.g., Tanaka & Pierce, 2009; Walker & Hewstone, 2006; Walker et al. 2008). In one case, mere contact operationalized through repeated exposure diminished cross-race identification, perhaps through lower attention and increased heuristic processing due to increased familiarity (Palma & Garcia-Marques, 2021). In addition to mere contact, more effortful face processing may be required to promote cross-race face expertise. In the next section we discuss the role that motivation may play in promoting more effortful processing that can promote face memory.

Motivation

The second central tenet to the CIM – motivation – is also theorized to impact face processing style and face memory. The CIM argues that categories, such as race, serve to signal perceivers of the target's relevance. Upon initial exposure to a face, a perceiver quickly extracts social category information that can help to determine their motivation to engage with the target. If the target is deemed relevant, perceivers will engage in more effortful processing toward individuation. If the target is deemed irrelevant, the target will not be individuated. Rodin's Cognitive Disregard Theory (1987) similarly argues that attention to and memory for a person depends on the person's degree of relevance to the perceiver. Rodin's theory suggests that perceivers are unlikely to allocate valuable processing resources to those they identify as

irrelevant to their personal goals. In a similar vein, the Relevance Appraisal Matrix (Neel & Lassetter, 2019; Lassetter et al., 2021) proposes a model for appraisal of social targets based on perceived goal facilitating or goal impeding qualities. This model argues that social targets may attract attention and processing resources dependent on their a) relevance to goal facilitation and b) relevance to goal obstruction. These are considered separate dimensions that are subject to change dependent on current perceiver goals. Those deemed relevant to numerous important goals (either facilitating or impeding them) attract attention and garner cognitive resources, while those individuals or groups seen as goal irrelevant may be overlooked and made “invisible” (Neel & Lassetter, 2019).

Empirical work has supported this perspective. For instance, White perceivers are commonly more motivated to encode the identities of ingroup and high-status group members as compared to outgroup and low-status group members, and this differential motivation serves to inspire differential face processing and memory (e.g., Hugenberg & Corneille, 2009; Ratcliff, Hugenberg, Shriver, & Bernstein, 2011). Largely White perceiver samples were more likely to deploy configural processing towards faces considered personally relevant, such as members of minimal ingroups (versus outgroups; Hugenberg & Corneille, 2009), high-status groups (versus low-status groups; Ratcliff et al., 2011), and targets with whom the perceiver expects to interact in the near future (Wilson et al., 2014). Motivational relevance can even diminish the CRE when a cross-race target is a member of a minimal ingroup (Hehman et al., 2010). Conversely, the CRE can be diminished by reducing accurate identification of *same-race* faces when they are presented in contexts where the target lacks the resources and power needed to be

motivationally relevant to the perceiver (Shriver, Young, Hugenberg, Bernstein, & Lanter, 2008). Together, this evidence suggests that a target's motivational relevance to the perceiver elicits distinct patterns of face processing with consequences for memory.

Stigma, motivation, and face processing. We can consider how one's stigmatized identity might influence the perceiver's motivation to individuate, and thereby impact face processing and memory. Relatively speaking, stigmatized perceivers often have limited access to important resources, while the non-stigmatized tend to control the access to important resources. Stigmatized perceivers are aware of their relative position in this social hierarchy (Rosenberg, 1979; Casas, Ponterotto, & Sweeney, 1987), and are sensitive to intermediate positions within a hierarchy, sometimes favoring those people who are above them in the hierarchy over those who are below them (Dunham et al., 2014). This relative bias in favor of higher positions within a social hierarchy may be present among children as young as nine years old, who show implicit bias against members of socially-devalued groups (Dunham et al., 2014). This pattern of evaluation may vary, however, depending on the specific groups examined, and whether evaluations are implicit or explicit (Essien, Calanchini, & Degner, 2021). This research suggests that stigmatized perceivers may have higher motivation to individuate and remember the face of a non-stigmatized target relative to a stigmatized target (Fiske, 1993; Mason, Zhang, & Dyer, 2010). Supporting this claim, Vingilis-Jaremko and colleagues (2020) provide preliminary support for a status-effect in outgroup face memory. In their internal meta-analysis, minority participants recognized outgroup White majority faces better than outgroup minority faces.

However, it is important to note this effect was considerably smaller than the CRE effect (across White, Black, and East Asian perceivers) and was not statistically significant in individual studies.

On balance, minority and stigmatized group members are often subjected to discriminatory action by non-stigmatized group members. These experiences with and expectations of discrimination are motivationally relevant; perceivers must attend to and process environmental threats to best overcome or avoid them. Yet, perceivers may show individual variation in their awareness and responses. Supporting this supposition, Black individuals with higher levels of suspicion of White individuals' motives demonstrate faster attentional deployment to White versus Black smiling faces (Kunstman et al., 2016). This vigilance of Whites' motives is theorized to play a role in enhanced individuation and social sensitivity for Whites' emotional authenticity among minority group members (Kunstman et al., 2016). Relatedly, research suggests that women high in stigma consciousness direct greater attention to identity threat-related cues presented subliminally (Kaiser et al., 2006).

Harkening back to the Neel and colleagues (2019, 2021) Relevance Appraisal Matrix, high-status and majority group members often control resources, hold powerful positions, and pose threats to stigmatized individuals (e.g., discrimination). For these reasons they may be deemed relevant to numerous important goals (either impeding or facilitating them). By contrast White perceivers may evaluate cross-race others as irrelevant to goal completion due to low-status and unequal resource allocation. Thus predictions for same and cross-race face perception and memory diverge when considering perceiver identity. Cross-race individuals may pose differential opportunity and threat relevance dependent on perceiver characteristics

including their own position in the hierarchy or experience with discriminatory action. Taken together, these perspectives suggest that minority and stigmatized group members may be motivated to attend to outgroup and cross-race faces for several reasons, yielding enhanced holistic and configural face processing as well as advantages in cross-race memory.

Cognitive Resources

Although not explicitly identified as a tenet of the CIM – cognitive resources are integral to numerous face processing phenomena implicated in face memory. To this point, configural processing likely requires more cognitive resources than featural processing: it is more complex (Piepers & Robbins, 2012), develops more slowly (Mondloch, Le Grand, & Maurer, 2002), and requires more practice (Wong, Palmeri, & Gauthier, 2009) than featural processing. Therefore, more effort may be required by the perceiver to engage configural versus featural processing. Reinitz, Morrissey, and Demb (1994) demonstrated that when perceivers' attention was divided, their ability to recognize old versus new facial features (e.g., a nose) remained, but their ability to recognize old versus new faces was impaired. Similarly, Zhou, Young, & Tse (2014) demonstrated that divided attention eliminated the CRE by impairing memory for same-race faces. These results suggest that divided attention inhibits configural processing of individual facial features as a coherent gestalt with implications for face memory. More recently, Palermo and Rhodes (2002) found converging evidence that attention is required for configural face processing, with limits on the number of faces processed at once. Taken together, research suggests that the more resources a perceiver has available during face encoding, the more likely they will deploy configural processing to individuate and remember a given face.

Stigma, cognitive resources, and face processing. While the CIM does not identify cognitive resources as a central tenet, it does assert that cognitive resources are required to individuate faces. However, we argue that considering cognitive resources as a unique predictor of face memory is necessary to capture differential perceiver experiences across stigmatized and dominant group members. To this point, research examining some of the experiences of stigmatized perceivers – stereotype threat (Steele & Aronson, 1995), attributional ambiguity (Crocker & Major, 1989), being the target of discrimination (Clark, Anderson, Clark, & Williams, 1999), and less access to economic resources (Bhutta, Chang, Dettling, & Hsu, 2020) – suggests that, in the context of cross-race perception, stigmatized individuals are likely to experience depleted cognitive resources to the detriment of configural processing.

For instance, stereotype threat can impair performance when a stigmatized perceiver fears confirming a salient negative stereotype about their group (Steele & Aronson, 1995). Stereotype threat works, in part, by reducing the working memory capacity available to the perceiver completing a task (Schmader, Johns, & Forbes, 2008). In addition, stigmatized perceivers may experience attributional ambiguity regarding whether the causes of their outcomes can be attributed to a fair assessment of their abilities or to an evaluator's prejudice toward their social group (Crocker & Major, 1989). This uncertainty has been linked to decreased performance on a cognitive task following an ambiguous event (Mendes, Major, McCoy, & Blascovich, 2008) and may be another factor that systematically depletes the cognitive resources available to a stigmatized individual. Relatedly, for stigmatized perceivers, interactions with a non-stigmatized group member can be a cognitively depleting experience.

For instance, Black individuals exposed to ambiguous evidence of racial prejudice showed greater cognitive impairment compared to White individuals, as indexed on an inhibitory control task (Salvatore & Shelton, 2007).¹ Finally, limited access to economic resources is a pervasive challenge facing many stigmatized minority groups. For example, in the US in 2019, the average White family had nearly eight times the wealth as the average Black family (\$188,200 v. \$24,100 US; Bhutta, Chang, Dettling, & Hsu, 2020). Evidence suggests that economic scarcity can impact the use of limited cognitive resources, compelling people to reserve these limited resources to help solve the most pressing problems at hand (Shah, Mullanaithan & Shafir, 2012). Considering the confluence of these potential sources, we hypothesize that stigmatized perceivers may experience greater cognitive resource depletion in general, and in particular during interactions with non-stigmatized individuals, with consequences for face processing style and their ability to remember cross-race face identities accurately.

Summary

While research has examined how group membership of targets influences the extent to which a perceiver will engage configural face processing and individuation, models to date have yet to systematically examine how patterns of face processing and face memory may also depend on identity-based status distinctions among perceivers. Relative to racial majority group perceivers, temporary and chronic experiences with stereotyping, prejudice, and discrimination among racial minority perceivers has several psychological consequences with implications for

¹ And while these effects may be more likely to affect individuals who have been chronically stigmatized, cognitive impairments also afflict White individuals who also face a type of stigma: concerns with appearing racist in interracial interactions (e.g., Apfelbaum, Sommers, & Norton, 2008; Richeson & Shelton, 2007).

face memory. We've outlined three factors (expertise, motivation, and cognitive resources) that may facilitate or impede the extent to which a perceiver will employ configural and holistic processing when viewing a novel face. We've also examined how variation on these factors may explain or predict divergence in CRE findings between stigmatized versus non-stigmatized perceivers. First, stigmatized minorities more frequently navigate environments with greater exposure to (and hence expertise with) racial majority group faces, thus facilitating configural face processing and memory for cross-race faces. Second, stigmatized minorities have motivation to attend to racial majority group faces who disproportionately control access to resources and pose material and psychological threats, thus facilitating configural face processing and memory for cross-race faces. Third, stigmatized minorities experience strained cognitive resources in interactions with non-stigmatized others or contexts in which their stigmatized identity is salient, thus inhibiting configural face processing and cross-race face memory.

Taken together, these conditions suggest that minority perceivers' experiences of stigmatization manifest in unique cognitive, experiential, and motivational forces with consequences for intergroup face processing and memory that help to explain the inconsistent findings for the CRE among stigmatized perceivers discussed above. If we assume that each moderator influences face memory equally, the default pattern suggests a diminished or nonexistent CRE among stigmatized vs. non-stigmatized perceivers. However, there are times where the CRE is evident or even reversed among stigmatized perceivers. In this case, it's possible that considering interactions among moderators could add explanatory power. In the

final section we consider this and other implications of incorporating an identity stigmatization approach for researchers exploring face processing effects on memory and other downstream consequences.

Directions Forward: Benefits and Opportunities Of a Stigmatized Perceiver Perspective in Face Processing Research

Generalizability

Future research should include stigmatized minority perceivers into their research designs. The outlined stigmatized perceiver perspective not only aids in explaining inconsistencies in face memory findings, especially among minority race perceivers, but also offers a more inclusive model of factors influencing face memory and broader perception phenomena. Limiting psychological investigations to narrow samples limits the extent to which we can generalize our conclusions to a universal population (Henrich, Heine, and Norenzayan, 2010; Roberts, Bareket-Shavit, Dollins, Goldie, and Mortenson, 2020). Researchers exploring face perception who do not consider these possibilities will be at a disadvantage when attempting to generalize their work to broader populations. As evidenced here, an identity stigmatization perspective can help to reconcile inconsistencies among findings from CRE studies that do and do not include minority populations.

Researchers should be particularly cautious about general characterizations of theories and models under investigation that may have broader implications outside of the theoretical literature. Face memory deficits have been implicated in adverse and discriminatory outcomes including poor interaction success but also consequential legal outcomes including

misidentification in eye-witness testimonies (Brigham, Bennett, Meissner, & Mitchell, 2007; Platz & Hosch, 1988). Thus, the comprehensiveness of theories governing face processing and memory are both practical and meaningful.

Variability in the Experiences of Stigmatized Perceivers

Future research should explore sources of potential variation among stigmatized perceivers. Considering the relative strength of these cognitive, motivational, and experiential influences dependent on perceiver individual differences (e.g., exposure to discrimination, vulnerability to stereotype threat; stigma consciousness) and situational context (e.g., social hierarchies, diversity of environment, interaction type [e.g., job interview vs. social gathering]) will support researchers in understanding the face processing experiences and outcomes for racial minority perceivers. Over time, stigmatized minority perceivers may adopt strategies for coping with stigma that have implications for each moderator that run counter to the defaults as described above. For example, anticipated discrimination may lead to stigmatized perceivers to limit contact with outgroup individuals (e.g., Brigham, 1993; Shelton & Richeson, 2006), thus limiting exposure/expertise with cross-race faces. Or, the effects of stigma may not always enhance the motivational relevance of a target face; stigmatized perceivers may be motivated to avoid rather than attend to outgroup faces if they represent extreme threats to material, psychological, and physical well-being (c.f., Richeson & Trawalter, 2008). Third, in the long term, the experience of stereotype threat in an achievement domain may lead to psychological disengagement of motivation, effort, and self-esteem (Major, Spencer, Schmader, Wolfe, & Crocker, 1998). Relatedly, potentially threatening situations may be appraised as a function of

whether the stigmatized perceiver believes they have the resources to cope, either leading to a challenge (approach) or a threat (avoidance) response (e.g., Blascovich et al., 2001; Sawyer et al., 2012).

Interactions among Moderators

Future research should explore potential interactions among the moderators. We have largely discussed these factors influencing face processing as functioning independently from each other. However, it is likely that they interact, and furthermore possible that experiencing social stigma influences one's available cognitive resources, motivation to individuate, and level of perceptual expertise in ways that causes these three factors to in turn, influence each other. For instance, our default pattern suggests that relatively limited cognitive resources does not significantly impair face memory for stigmatized perceivers, and this may be due to the compensatory influence of expertise and/or motivation. Generally speaking, experts tend to require fewer resources than novices (e.g., Campitelli, Connors, Bilalić, & Hambrick, 2015), and motivation may help to drive resource allocation (e.g., Grogan, Randhawa, Kim, & Manohar, 2021). However, while we would expect a stigmatized perceiver to be more expert and/or highly motivated to individuate (and process configurally) when viewing the face of a non-stigmatized target, the influence of this motivation may be limited in situations where the cognitive resources available to the perceiver are severely strained (e.g., stereotype threat). In a similar vein, we might also predict an interaction between expertise and motivation. For instance, while a stigmatized perceiver might have limited experience processing faces from a novel non-stigmatized group, high motivation to individuate the target may engage configural

processing despite their low expertise. Future work should aim to examine the interplay of these three factors as they relate to face processing in general, and particularly among minority perceivers.

Intraminority Face Perception

Future research should explore how stigmatized minority groups perceive each other.

Another potential benefit to this approach is a consideration of the factors that might predict face processing performance across groups that share minority status within a society. Here, a consideration of the relative status of minority groups may be informative. For example, Zou & Cheryan (2017) posit a model of racial positioning in the US that places racial groups on two axes that determine cultural subordination: relative status superiority and foreignness. Relative to Whites, other racial minority groups are subordinated on both dimensions, but to differing degrees. Relative to Asians, Blacks are seen as more inferior but less foreign. Our model suggests that factors influencing the relative salience of these dimensions in a perceiver would dictate the psychological state and resulting pressures on cross-race face memory. Black perceivers focused on their relative status inferiority may show improved memory for Asian faces, while Blacks focused on their relative foreignness superiority may show impaired memory for Asian faces.

Upstream and Downstream Processes

The current model extends theory within but also beyond face-memory. A consideration of how stigmatized and non-stigmatized individuals may differ across these cognitive, motivational, and experiential factors may explain the seemingly disparate and incoherent

nature of the CRE among racial minority perceivers. Although we focus on face memory, broader face perception phenomena lacking attention to perceiver identity may similarly benefit from integration of a stigmatized perceiver perspective.

Face Processing. A stigmatized perceiver perspective in the face processing literature could offer a novel look at the many factors that have been implicated in face processing, and lead to models that more accurately reflect the broad range of identities, experiences, and perspectives. Future investigations leveraging the stigmatized perceiver perspective may find, for instance, that stigmatized perceivers do not engage face-processing strategies according to the theories developed from (predominantly) non-stigmatized perceivers' observed behavior. Overall, the experiences related to being stigmatized— greater expertise with, and increased motivation to individuate, non-stigmatized others—suggest that stigmatized perceivers may exhibit enhanced configural processing relative to non-stigmatized perceivers. As configural processing is cognitively taxing, this may be another factor contributing to the cognitive depletion experienced by stigmatized perceivers. On the other hand, the cognitive depletion related to experiencing stigma suggests that stigmatized perceivers may have fewer cognitive resources, making configural processing more difficult to employ. Purposeful consideration of identity will serve to advance theory and create more inclusive and comprehensive models of face processing.

Impression Formation. For those who seek to better understand and potentially mitigate racial disparities, it may be useful to explore the nuances underlying face perception and its link to the impressions we form of others. Prevailing theories of face perception assume that

configural face processing is an important mechanism by which a face is individuated (e.g., Hugenberg et al., 2010) and empirical investigations have demonstrated a correlation between individuation and configural processing (Bukach, Cottle, Ubiwa, & Miller, 2012; Wong, Palmeri, & Gauthier, 2008). If, indeed, stigmatized perceivers are more likely to engage configural processing towards their non-stigmatized counterparts, this may work to reinforce the social status hierarchy. Consider the context of a job interview between a stigmatized (e.g., Black) candidate and a non-stigmatized (e.g., White) interviewer, and strip away any verbal or behavioral information that may result. At baseline, a stigmatized candidate is more likely to be motivated to engage cognitively taxing face processing techniques that promote individuation, so the non-stigmatized interviewer receives the benefits of individuation. At the same time, that interviewer is less likely to be motivated to engage in a cognitively taxing face processing technique, thus depriving the stigmatized interviewee of the benefits of individuation. Moving away from that baseline, if there are factors in the interaction setting that affect the stigmatized interviewee's tendency toward configural processing, this will have an influence on their resulting impression, expectations, and behavior. For example, additional strains on cognitive resources like impression management or stereotype threat could impede individuation and the interviewee's ability to engage in a positive interaction.

Conclusion

We've argued for greater empirical focus on how the experience of stigma may influence face processing, face memory, and their downstream consequences. Further, we offered a conceptual framework and theory-based predictions to guide this work. The extent to which

future investigations focusing on the role of perceiver identity verify these predictions will provide a more robust test of the current theories of face perception and provide valuable insight into how these processes contribute to patterns of intergroup interaction and societal disparities. The concerns we've outlined here are not unique to the literature exploring face perception (e.g., Chen, Quinn, & Maddox, in press). Indeed, the field of psychological science finds itself in a time of uncertainty and change as we work to address critiques that challenge psychology to grow into a more open and inclusive science (Ledgerwood et al., 2021; Ledgerwood et al., 2020).

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