

Abstract

Black men are stereotyped as physically formidable and threatening. Across 3 studies, we investigate whether this threat stereotyping is diluted when Black men are obese. We competitively tested two hypotheses investigating whether obese Black men will be seen as less racially stereotypic overall, or as uniquely less threatening (but still racially stereotypic more broadly). In Study 1, perceivers were less likely to list threat as a stereotype of obese Black men than weight-unspecified Black men. In Study 2, obese Black men were subject to reduced threat stereotypes, but were still subject to other stereotypes about Black men. Finally, in Study 3 this threat-specific dilution led perceivers to anticipate feeling less threatened by obese Black men, and believe police use-of-force is less justified toward obese Black men, relative to average-weight Black men (Study 3). Taken together, these findings demonstrate that the well-established stereotype of Black men as threatening is not applied equally across weight. Instead, contradicting stereotypes of obese individuals as physically and psychologically incapable of threat dilutes the Black-threat stereotype. However, obese Black men are still subject to harmful race-based stereotypes unrelated to threat.

Keywords: Prejudice/stereotyping, person perception, racism, social cognition

Stereotyping at the Intersection of Race and Weight:

Diluted threat stereotyping of obese Black men

The rise of intersectional models of stereotyping in social psychology allow for new lenses through which to integrate previously disparate literatures in the intergroup and stigma traditions (see Remedios & Vinluan, in press for a review). In the present work, we investigate stereotypes of obese Black men. Extensive research indicates that Black men are often targeted with stereotypes including threat or physical aggression (e.g., Dixon & Maddox, 2005; Devine, 1989; Duncan, 1976; Donders et al., 2008; Eberhardt et al., 2004; Todd et al., 2016; Wilson et al., 2017). For instance, Black men are judged as physically larger and more formidable than size-matched White men (Wilson et al., 2017). Yet, obesity stigma often involves negative stereotypes of obese men as physically incapable and introverted (Hu et al., 2018). For instance, obese men are stereotyped as less physically capable physical action than lower-weight men (Sim et al., 2021). These apparently conflicting stereotypes make for a fruitful domain in which to investigate how intersectional stereotypes may operate, while also providing an important practical advance. Indeed, Black men are overrepresented among obese individuals in the United States, and both obese and Black men are more likely than non-obese and non-Black individuals to report interpersonal and institutional discrimination (Carr & Friemdan, 2005). Despite these alarming statistics, little social psychological research has investigated stereotyping at the intersection of race and weight (*cf.* Hebl & Heatherton, 1998; Hebl & Turchin, 2005).

Our primary goal was to investigate whether obese Black men may be subject to diluted Black-threat stereotyping. We see this as an important goal in service of expanding our understanding of both racial bias and weight stigma. This endeavor will also add to our

increasing understanding of how interlocking identities and categories can influence person perception and stereotyping processes (Hall et al., 2019; Petsko & Bodenhausen, 2020; see Remedios & Vinluan, in press for a review). Prior work shows less racially prototypic group members are often ascribed fewer racial stereotypes overall (e.g., Petsko & Bodenhausen, 2019a; Blair et al., 2002; Maddox & Gray, 2002). For example, Petsko and Bodenhausen (2019a) find that gay Black men were ascribed fewer racialized stereotypes of Black men than were straight black men. In the present work we investigate whether obese Black men will be seen as broadly less racially stereotypical *or* whether they might be seen as only less stereotypical along specific traits in which stereotype content is in conflict. Threat may be just such a dimension, given that (average weight) Black men are stereotyped as physically capable and threatening, but obese men are stereotyped as physically incapable and placid.

To this end, we begin by discussing the conflicting stereotype content of Black men and obese men. Then, we discuss research showing how intersections of categories influence social judgment, sometimes diluting stereotyping effects. Finally, we present three studies investigating the diluted threat stereotyping of obese Black men, considering two competing hypotheses for how race and weight may intersect to influence stereotyping.

Contradicting Stereotypes of Black Men and Obese Men

Black men and obese men are targeted with seemingly contradicting stereotypes regarding physical threat, which makes this a fruitful area for testing models of intersectional stereotyping. First, Black men have long been stereotyped as physically threatening, hostile, and aggressive (e.g., Dixon & Maddox, 2005; Duncan, 1976; Donders et al., 2008; Eberhardt et al., 2004; Hester & Gray, 2018; Hugenberg & Bodenhausen, 2003, 2004; Todd et al., 2016; Wilson et al., 2017). For instance, Wilson and colleagues (2017; see also Johnson & Wilson, 2019) find

that White perceivers erroneously believe Black men are stronger, larger, and more physically formidable than equivalently-sized White men, an effect that is linked both to viewing Black men as more capable of physical harm-doing and to the justification of greater policing of Black men (Hester & Gray, 2018). Further, young Black men are stereotyped as angrier than comparable White men (e.g., Hugenberg & Bodenhausen, 2003, 2004; Kang & Chasteen, 2009). Ultimately, this stereotypic link between Black men and threat leads to biased judgments. For example, ambiguous actions perpetrated by Black men (relative to White men) are interpreted as more violent and dispositional (Duncan, 1976; see also Granot et al., 2018), which can affect outcomes ranging from schooling (Halberstadt et al., 2018; Okonofua & Eberhardt, 2015; Riddle & Sinclair, 2019) to criminal sentencing (Kleider-Offutt et al., 2017).

However, the stereotypes of obese men are quite distinct from those of Black men. Obese men are stereotyped as relatively physically and psychologically ill-suited for aggression. For instance, obese adults are judged as less physically capable and athletic (Brodsky, 1954; Sim et al., 2021), and perceivers often have lower expectations for the physical capacities of overweight, relative to average-weight targets (Greenleaf & Weiller, 2005). These stereotypes of low physical capacity imply a low physical capacity for threat. Relatedly, stereotypes about obese men suggest they appear psychologically unlikely to aggress as well. Even in classic work on “somatotypes,” participants evaluated obese targets as low in aggressiveness, relative to other body shapes (Brodsky, 1954). More recently, Hu and colleagues (2018) found that people with heavier-weight bodies are also evaluated as low in aggressive characteristics (or agentic characteristics broadly), including being seeming shy, introverted, and lazy. Taken together, it appears clear that obese individuals are stereotyped as low in aggressive tendencies.

Yet, research on race stereotypes and research on obesity stereotypes have largely been conducted in isolation. When researching race stereotypes, targets are often portrayed as relatively physically fit (e.g., Wilson et al., 2017). When researching obesity stereotypes, targets are often presented as race-unspecified line drawings, providing only simple outlines of various body shapes (e.g., endomorphs) with no other category information (e.g., Brodsky, 1954; Hu et al., 2018; Himmelstein et al., 2017). What are the implications of this apparently contradicting stereotype content for obese Black men? We next turn to intersectionality frameworks to generate multiple competing hypotheses.

Stereotypes at Category Intersections

Crenshaw's (1989, 1991) intersectionality framework was developed to understand the erasure and exclusion of Black women by interacting systems of racism and sexism. At its core, this perspective argues that these systems of oppression and privilege create overlapping and interlocking effects that are unique at the intersection of identities. Indeed, each individual has multiple identities (e.g., race, gender, sexual orientation, class), and their experiences are shaped by interlocking systems of oppression that uphold White, male, heterosexual, and upper-class standards (e.g., Purdie-Vaughns & Eibach, 2008; Remedios & Vinluan, in press).

This intersectionality perspective has been extended to understand how cultural stereotypes can create unique patterns of stereotyping at the intersections of social identities. However, predicting stereotype content at these intersections is complex. Multiply marginalized individuals may be subject to amplified or diluted stereotyping (e.g., Hall et al., 2019), activation or inhibition of different category stereotypes (e.g., Petsko & Bodenhausen, 2019a, 2019b; Petsko & Bodenhausen, 2020; see Remedios & Vinluan, in press, for a review), and distinct stereotype content (e.g., Ghavami & Peplau, 2013) or intergroup motives (Purdie-Vaughns &

Eibach, 2008; Neel & Lassetter, 2019) typical of none of the superordinate categories. Given that individuals with multiple marginalized identities experience distinct forms of oppression (e.g., Purdie-Vaughns & Eibach, 2008) and can be targeted with stereotypes distinct from single categories alone (e.g., Hall et al., 2019; Petsko & Bodenhausen, 2020), it is important to understand stereotyping effects at the intersection of overlapping category representations (Johnson et al., 2012).

In the present work, we begin with the observation that well-established threat stereotypes targeting Black men, and well-established physical and agentic incapacity stereotypes targeting obese men, appear to be in conflict. Our first goal was to investigate whether Black-threat stereotypes might be diluted for obese targets. Indeed, multiple theoretical models point to this possibility.

A Stereotype Dilution Hypothesis

One possibility is that obese Black men will be subject to “diluted” stereotypes based on contrasting category stereotypes. The MOSAIC model (Hall et al., 2019) – a model of stereotyping through associated and intersectional categories – outlines how perceivers integrate stereotypes from multiple demographic categories. This model argues that one salient category serves as an initial “foundational” category, either due to chronic salience or contextual salience. In our case, we treat race as a foundational category because it is often a chronically salient category which serves as a primary dimension of social evaluation (Brewer, 1988; Fiske & Neuberg, 1990; Stangor, Lynch, Duan, & Glass, 1992). When targets share a foundational category, such as race, but differ on an “intersectional” category (i.e., a category that distinguishes targets from the category prototype), in our case weight serves as such an intersectional category, stereotyping processes can be affected by the consistency of stereotype

content across the foundational and intersectional categories. When a target has two or more categories with consistent stereotype content, perceivers can generate *amplified* stereotype content. Amplification occurs because the intersectional category stereotypes are shared with the foundational category, and thus the target seems highly prototypical of the foundational category. For example, if “men” and “Black people” are both evaluated as masculine (Johnson, Freeman, & Pauker, 2012), Black men will be evaluated as *particularly* masculine and highly prototypic of their gender relative to White men. Conversely, when a target has multiple categories with contradicting stereotypes, perceivers often generate *diluted* stereotype content. Dilution occurs because the stereotype content of the intersectional category appears inconsistent with the foundational category, and thus the target seems *less* prototypical of the foundational category. For example, if “women” are perceived as feminine but “Black people” are perceived as masculine, Black women will be evaluated as less feminine and less prototypic of their gender than White women.

This amplified and diluted stereotype content can help explain intersectional advantages and disadvantages (e.g., Hall et al., 2019; Purdie-Vaughns & Eibach, 2008). For instance, dominant Black females face less backlash than dominant White females, arguably because it is less inconsistent with stereotypes of femininity (Livingston et al., 2012), yet Black women also report more workplace discrimination than do men of color and White women, arguably because they appear to fit neither racialized nor gendered expectations (Berdahl & Moore, 2006). Further, because Black women are judged as less prototypical of both their race and gender categories, they are often invisible in social contexts (e.g., Purdie-Vaughns & Eibach, 2008; Neel & Lasseter, 2019; Sesko & Biernat, 2016; Hall et al., 2019).

How might intersecting categories affect stereotypes of obese Black men? Given the apparent inconsistency of the Black male and obese male stereotypes, we predicted that threat stereotype content may be diluted for obese Black men. Indeed, there is indirect support for this possibility in the literature. First, research on the “Teddy Bear Effect” found that Black CEOs had more babyish facial features than White CEOs, and baby-faced Black CEOs were more successful than mature-faced Black CEOs, an effect not observed among White CEOs (Livingston & Pearce, 2009). Babyish features are stereotypically associated with innocence and warmth (see Zebrowitz, 1997), arguably diluting threatening Black male stereotypes. Similar effects emerge at the intersection of age and race. Whereas young adult Black male faces are perceived as angry (Hugenberg & Bodenhausen, 2003; Hutchings & Haddock, 2008), elderly Black males are perceived as happier (Kang & Chasteen, 2009). Here again, judgments of youthful Black men are guided by threatening stereotypes, but this tendency is diluted for older men (who are typically seen as less capable of physical aggression). Thus, some evidence indirectly supports the possibility that a diluting effect may occur on threat stereotyping of obese Black men.

Competing de-racialization versus threat-specific hypotheses

Although we have clear reason to predict that obese Black men may be subject to diluted threat stereotypes, it is unclear whether this dilution effect would be specific to threat-related stereotypes, or a broader “de-racialization” of obese Black men. Indeed, recent research has shown perceivers can de-racialize members of racial groups with intersecting categories that include competing stereotype content (e.g., Petsko & Bodenhausen, 2019a; Handron et al., 2017). For example, Petsko and Bodenhausen (2019a) found that gay Black and Hispanic men (relative to straight Black and Hispanic men) were assigned fewer traits stereotypic of their own

racial or ethnic group. Similarly, overweight Asian targets are perceived as more “American” (e.g., more fluent with English, more likely to have legal documentation), and are therefore less likely to be targeted with Asian stereotypes compared to their average-weight Asian counterparts (Handron et al., 2017). According to compartmentalization models of intersectionality, multiply stigmatized individuals may be evaluated through one or more of their demographic categories at a given time, depending on the context and saliency of those categories (Petsko & Bodenhausen, 2020; Petsko & Bodenhausen, 2019b). One marginalized category may be made particularly salient if it is associated with the context (e.g., Blackness and crime; Petsko & Bodenhausen, 2019b), effectively reducing the salience of an individual’s other marginalized categories. Broadly, all of these models make possible that the apparent incompatibility of Black male stereotypes and obese male stereotypes might lead to a domain general de-racialization of Black men, diluting Black stereotype content broadly.

This de-racialization hypothesis is also indirectly supported by research on racial prototypicality. In classic work on racial phenotypicality bias, perceivers judge individuals with apparent Black-prototypic physical features (sometimes called “Afrocentric” features; e.g., darker skin color, broader nose, fuller lips) as highly prototypical of their racial category, which more strongly activates Black cultural stereotypes than individuals with lower levels of such features (e.g., Maddox, 2004; Blair et al., 2002; Blair et al., 2004; Eberhardt et al., 2004; Maddox & Gray, 2002). For instance, participants were more likely to list Black-stereotypic traits (e.g., criminal, athletic, lazy, unintelligent) for dark-skinned targets compared to light-skinned targets (Maddox & Gray, 2002). In short, Black individuals with more Black-prototypic features are seen as more racially prototypic, and thus as more stereotypic of their racial category overall. Notably, the phenotypicality bias is often observed along a broad range of traits, with less Black-

prototypic targets assigned fewer racial stereotypes overall. Intersectionality perspectives have also considered how individuals with multiple marginalized identities can be subject to prototypicality biases. For instance, Black women are evaluated as less prototypic of both their racial and gender categories and are consequently subject to intersectional invisibility (Purdie-Vaughns & Eibach, 2008). This question of prototypicality is important here as well. Put simply, perhaps obese Black targets are also seen as less prototypical of their racial category, and thus are subject to broadly diluted Black stereotypes (or de-racialization).

An alternate possibility is that the intersectional effects of race and weight may be trait specific. Whereas the negative stereotypes of Black men and obese men appear to conflict in terms of physical threat, creating the possibility of stereotype dilution on this trait, other negative stereotypes of the groups appear quite consistent with one another. For example, stereotypes of Black men and obese men include content regarding poverty and laziness (Crandall, 1994; Freeman et al., 2011; Puhl & Heuer, 2010). Given that there are multiple possible points of stereotypic overlap between these categories, but at least one clear point of conflict (i.e., threat), it seems plausible that the dilution effects at the intersection of race and weight might occur narrowly at those points of conflict. Existing models of intersectional stereotypes (e.g., compartmentalization model; MOSAIC model) and racial prototypicality bias models (e.g., Maddox, 2004) often focus on the level of broad category stereotypes. Yet past research has also shown that unique, trait-specific effects are possible at category intersections (e.g., Ghavami & Peplau, 2013).

If we were to observe stereotype dilution for threat stereotypes at the intersection of race and weight, but not more broadly for other Black male stereotypes, this could be a valuable theoretical advance as well. Whereas past work has tended to focus on how category

prototypicality can influence intersectional stereotypes overall (e.g., Hall et al., 2019) or how an intersecting stereotype can lead to broad de-racialization effects (e.g., contradicting SES stereotypes; Petsko & Bodenhausen, 2019a), the present work investigates a context in which the effects of intersecting categories may produce *trait specific* dilution effects. If true, such findings could have implications for classic conceptualizations of category prototypicality, implying not just that some category combinations are low in prototypicality (e.g., the finding that Black women seem less prototypical than either White women or Black men; Stroessner, 1996), but also that prototypicality effects can occur at the level of the specific stereotypes.

Our strong a priori prediction was that obesity would dilute threat stereotyping of Black men. However, because both predictions the de-racialization and the trait-specific hypotheses appeared sensible, and grounded in prior research, we did not have strong a priori hypotheses for whether the dilution effects would be domain-general (i.e., de-racialization), or specific to the threat stereotype.

Current Research

We hypothesized that the stereotype of Black men as threatening would be diluted when these men were obese. We also explored whether dilution effects would occur for other domain-general stereotypes of Black people. The threat-specific dilution hypothesis predicts that obese Black men will be judged as less physically threatening, but as similarly Black-stereotypic across a broad range of characteristics. Alternatively, the de-racialization hypothesis predicts that obese Black men will be judged as less physically threatening *and* less Black-stereotypic across a broad range of characteristics.

As noted above, we are treating race as the “foundational” category and weight as the “intersectional” category in the MOSAIC model (Hall et al., 2019). The MOSAIC model would

predict that obese Black men are seen as less threatening than average-weight Black men due to conflicting stereotype content between Black men and obese men. Thus, our primary comparison of interest is between obese and average-weight Black men, where we may observe this diluted stereotyping effect. We also include obese and average-weight White targets in our studies for various reasons. First, including White targets allows us to investigate a separate but informative question of how *racial bias* may be moderated by target weight. From the perspective of racial bias, we predict that Black men will be stereotyped as more threatening than White men, but that this racial bias may be attenuated when targets are obese, as a function of the diluted threat stereotyping toward obese Black men. Second, comparisons within the White targets (obese vs fit White) would allow us to confirm whether the diluted threat stereotyping occurs uniquely for Black targets. Consistent with the MOSAIC model, dilution occurs when stereotypes conflict between demographic categories. However, for White targets, there are no threat stereotypes in conflict. Because neither fit White men nor obese men are subject to threat-based stereotypes, there should be no threat dilution (or reductions in perceived threat) toward obese White men. Therefore, by including White targets, we hope to provide evidence for the process by which obese Black men are subject to diluted threat stereotyping.

We investigated these questions in three studies. In Study 1, we adopted a stereotype trait listing paradigm, and found that (primarily White) participants were less likely to list threat-related characteristics as part of the cultural stereotype of obese Black men compared to weight-unspecified Black men. In Study 2, we found that diluted stereotyping effects for obese Black men were unique to threat-related traits and did not generalize to other non-threatening traits. Whereas obese Black men were rated as less threatening than average-weight Black men, the application of other negative Black stereotypes was unaffected by target weight. Finally, in

Study 3, we found that threat-stereotype application in response to a simulated scenario was attenuated for obese Black men, which fed downstream into attenuated justifications for police use-of-force against obese Black men.

Study 1

In Study 1, we adopted an exploratory approach to investigate the intersectional effects of race and weight on stereotyping. Adapting the procedures of Devine (1989, Study 1) and Petsko and Bodenhausen (2019a; Study 1c), we provided participants with one of five category labels at the intersection of race and weight (i.e., obese Black men; Black men; obese White men; White men; obese men) and asked participants to list five cultural stereotypes that come to mind for that group. Research assistants blind to hypotheses then coded these responses. Of particular interest was whether participants would be less likely to list physical threat stereotypes for obese Black men, compared to Black men generally. We were also interested in whether other stereotypes targeting Black men would be similarly applied to obese Black men.

Here, we may see evidence for a broad de-racialization, whereby participants are less likely to apply a broad range of Black cultural stereotypes to obese Black men. Alternatively, we may see evidence for trait specific dilution effects, whereby participants have some shared cultural stereotypes of Black men and obese Black men, and other stereotypes that are diluted or amplified (e.g., Hall et al., 2019). Thus, although our primary question pertains to the application of threat stereotypes, we also conducted exploratory analyses to investigate whether the effects were threat-specific or more general in nature.

Method

Participants

Initial data collection ($N = 211$) consisted of only four of the five conditions (obese Black men, Black men, obese White men, White men). A separate sample of participants ($N = 59$) completed the fifth condition (obese men), which allowed us to provide an additional control condition for the original study (described below). Participants in the secondary sample were not included in the sensitivity analysis, and thus were not included in the primary analyses.

We initially targeted 50 participants per condition based on Petsko and Bodenhausen's (2019; Study 1c) similar design and sample sizes, for a minimum of 200 participants in our initial 4 conditions. We conducted an *a priori* sensitivity analysis for Chi-Square contingency tables using G*Power (Faul et al., 2007), targeting 200 participants with a criterion of $\alpha = .05$ to detect 80% power. This sensitivity analysis determined that 200 participants would be sufficient to detect a minimum effect size of F (or w) = .20, with critical $X^2 = 3.841$. Two-hundred and eleven U.S. participants from Amazon's Mechanical Turk (MTurk; $M_{age} = 38.76$, $SD_{age} = 10.54$) participated in exchange for payment. See Table 1 for all studies' demographic data. We collected an additional 59 participants from MTurk ($M_{age} = 39.02$, $SD_{age} = 9.74$) for the subsequent fifth condition (described in procedure below), which provided an additional control condition.

We did not restrict participants on race or weight. In all studies, data were analyzed only after all data were collected, and sample sizes were determined *a priori* using G*Power. Additional analyses (including analyses excluding non-White participants) can be found in the supplemental online materials (SOM). To qualify for participation in all studies, MTurk participants were required to live in the U.S., have a study approval rate greater than 98%, and have been approved in at least 1000 prior studies. All data were included in all studies, and all measures, conditions, and participant exclusions are reported throughout these studies. Data,

code, and methodology file (i.e., manipulations and measures) are available online at https://osf.io/az9nu/?view_only=dd8090b6249b451db79ea39e977a2ff3.

Table 1

Participant Demographics for Studies 1-3b

	n	Gender			Race					
		Male	Female	Other	White	Black	Asian	Native American/ Alaska Native	Hispanic/ Latinx	Other
Study 1	270	52.6%	46.7%	0.7%	79.3%	8.1%	5.9%	1.1%	3.3%	2.2%
Study 2	60	63.3%	35.0%	1.7%	83.3%	6.7%	6.7%	0%	5.0%	3.3%
Study 3a	60	46.7%	53.3%	0%	83.3%	6.7%	3.3%	0%	5.0%	6.7%
Study 3b	80	61.3%	38.8%	0%	71.3%	13.8%	7.5%	0%	11.3%	7.5%

Procedure

Participants were told the study investigated cultural stereotypes of different groups. They were also told they would be asked to list cultural stereotypes of a given group, but that these stereotypes did not necessarily need to represent their own beliefs about the group. Next, participants ($N = 211$) were randomly assigned to one of four conditions, in which they were instructed to list five characteristics that are part of the current cultural stereotype of obese Black men ($n = 53$), obese White men ($n = 50$), Black men ($n = 56$), or White men ($n = 52$). In a subsequent wave of data collection with an otherwise identical procedure, participants ($n = 59$) were assigned to list five stereotypes about obese men. We collected this additional sample of participants to descriptively evaluate obesity stereotypes when race is unspecified, providing greater clarity for what race-based stereotypes might be in conflict or consistent with obesity stereotypes more broadly.

For the non-obese categories (i.e., Black men and White men), we chose not to add a physical category descriptor (e.g., “fit”) to avoid unintentionally priming concepts of physicality

or physical threat. Instead, we relied on past work showing that the lack of a descriptor elicits the category prototype (Stroessner, 1996). For example, Petsko and Bodenhausen (2019a) found that judgments of categories “Black men” and “White men” were indistinguishable from judgments of categories “straight Black men” and “straight White men,” respectively. Thus, we believed the absence of a physical category descriptor for the Black and White male groups would allow participants to assume the targets were average-weight, without unduly focusing participants on a “typical-weight” category.¹

After listing five cultural stereotypes of their assigned group, participants provided demographic information and were debriefed.

Results

Coding

To create a coding scheme, the primary investigators first reviewed the response data and noted common characteristics in each condition. Following Devine (1989; Study 1), the primary investigators then created 24 different stereotype categories to include as many of these common stereotypes as possible (see Table 2). Of particular interest was the stereotype category “Physically threatening,” which included characteristics such as aggressive, violent, hostile, threatening, tough, and dangerous. An “Other” category was also created to capture miscellaneous characteristics that did not clearly fit into the existing 24 categories, as well as a “Not Applicable” category to capture responses that appeared to be off task, resulting in a total of 26 possible categories.

¹ Confirming this supposition, participants were more likely to list traits relating to physical fitness for weight-unspecified categories (19% of participants) compared to obese categories (2% of participants), $\chi^2(1, N = 211) = 16.629, p < .001, F = -.281..$

Next, all identifying information was removed from the data, and the condition of each participant was masked. Two coders who were blind to the hypotheses and condition categorized each response into one of the 26 categories (i.e., 5 categorization decisions per participant, with a total of 1055 judgments in the initial wave of data collection, and 295 judgments in the secondary wave of data collection). Both waves of data were coded by the same researchers; the interrater reliability was 0.83 for the first wave of data and 0.77 for the second. Disagreements were resolved through discussion of the coders. The primary investigator (blinded to condition) served as a tie breaker for irreconcilable cases (17% of disagreements in wave one and 15% in wave two).

We next created multiple dummy-coded variables for the presence or absence of a given stereotype for each participant for each of the coding categories. For instance, if a given participant listed at least one threat stereotype (e.g., “threatening”) out of the five characteristics listed, that participant would receive a value of 1 for the dummy-coded “Threat” variable. If a participant did not list any threat stereotypes across the five characteristics listed, that participant would receive a value of 0 for the dummy-coded “Threat” variable. The proportions of participants in each condition who listed the stereotype categories are represented in Table 2.

Table 2

Proportion of Participants Listing Stereotypes in each Coding Category as a function of Condition.

Coding category	Black men	Obese Black men	White men	Obese White men	Obese men
Bigoted	.04	.04	.46	.14	.03
Conservative/traditional	.05	.02	.23	.16	.00
<i>Criminal</i>	.45	.08	.04	.02	.02
Dominant/career-oriented	.09	.02	.37	.02	.05
Entitled	.04	.06	.56	.26	.10
Intelligent	.02	.02	.31	.02	.03
Lonely	.00	.09	.00	.14	.17
Mad/Angry	.14	.06	.02	.06	.03
Music & hobbies	.13	.06	.08	.02	.03
Phenotypic features	.07	.15	.04	.04	.03
Physically attractive	.02	.02	.08	.02	.02
Physically disgusting	.07	.38	.00	.46	.27
Physically fit/athletic	.29	.02	.10	.02	.03
Physically incapable	.00	.19	.04	.14	.22
Physically threatening	.43	.13	.08	.02	.02
Poor	.13	.25	.00	.14	.02
Positive/warm personality traits	.07	.17	.14	.10	.03
Religious	.00	.06	.06	.02	.00
Rich	.00	.04	.42	.04	.02
Rude	.14	.23	.25	.10	.08
<i>Sexual</i>	.23	.04	.00	.02	.00
Specific food preferences	.09	.06	.00	.02	.00
<i>Unintelligent</i>	.43	.21	.14	.30	.19
<i>Unregulated/lazy</i>	.30	.64	.00	.64	.51
Aggregate Non-Threat Black Stereotypes	.71	.72	.17	.78	.54
Condition <i>n</i>	56	53	52	50	59

Note. Numbers represent the proportion of participants per condition who listed the category at

least once. The “Aggregate Non-Threat Black stereotypes” category represents a combination of the most commonly listed stereotypes that were unrelated to physical threat in the Black male condition. Italicized categories were included in the Aggregate Non-Threat stereotype category.

Primary Analyses: Are threat stereotypes diluted for obese Black men?

Our primary hypothesis was that the threat stereotypes often targeted at Black men would be diluted for obese Black men. To investigate this, we first tested whether race and weight related to the application of the “Physically threatening” category. As expected, the application of threat stereotypes depended on condition, $\chi^2(3, N = 211) = 38.131, p < .001, F = .425$. For Black male categories, there was a significant relationship between weight category and threat stereotypes, $\chi^2(1, N = 211) = 11.762, p = .001, F = -.328$. In the Black male category, 43% of the participants listed threat stereotypes, whereas only 13% of participants listed threat stereotypes in the obese Black male category, indicative of a threat dilution effect. However, for White male categories, there was no significant relationship between weight category and threat stereotypes, $\chi^2(1, N = 211) = 1.772, p = .183, F = -.132$. Thus, participants’ likelihood of applying threat-related stereotypes to a group depended on weight for Black, but not White, targets.

Another interesting question (although distinct from the dilution hypothesis) is how race relates to the application of threat stereotypes within each weight category. In other words, is there *racial bias* in application of threat stereotypes in both weight-unspecified and obese conditions? In the weight-unspecified categories, there was a significant relationship between race and application of threat stereotypes, $\chi^2(1, N = 211) = 17.361, p < .001, F = -.401$. In the obese categories, there was also a significant relationship between race and application of threat stereotypes, albeit to a lesser extent, $\chi^2(1, N = 211) = 4.511, p = .034, F = -.209$. In both cases, participants were more likely to list threat stereotypes for Black categories than White categories. However, this relationship between race and threat stereotypes was stronger when weight was unspecified.

We also explored whether weight category related to the likelihood of a participant listing common cultural stereotypes of Black men outside of threat stereotypes. Because of the large range of responses solicited by the free response task, we sought to reduce the data to analyze only commonly used Black stereotypes. Thus, we combined all stereotype categories that were listed by at least 20% of the participants in the Black male condition, creating one dummy-coded variable (see “Aggregate Non-Threat Black stereotypes” category on Table 2).² Participants were coded as “1” if they listed at least one of the four stereotype categories in the aggregate and a “0” if they listed none of the stereotype categories. If obese Black men are broadly de-racialized, the application of non-threat Black stereotypes should depend on the weight category for Black targets. For Black male categories, there was no relationship between weight and application of non-threat Black stereotypes, $X^2(1, N = 211) = 0.001, p = .975, F = .003$. Seventy-one percent of participants in the Black male category and 72% of participants in the obese Black male category listed cultural stereotypes of Black men unrelated to threat. Thus, the omnibus application of non-threat cultural stereotypes of Black men did not depend on weight. Surprisingly, however, for White male categories, there was a significant relationship between weight category and non-threat Black stereotypes, $X^2(1, N = 211) = 37.688, p < .001, F = .608$. 78% of participants in the obese White male category and 17% of participants in the White male category listed cultural stereotypes of Black men unrelated to threat. Although we did not have a priori hypotheses about the White conditions, this may suggest that cultural stereotypes of obese White men include a range of negative characteristics that overlap with negative stereotypic characteristics of Black men, particularly that they are unintelligent and lazy.

² These stereotypes included the categories “Criminal,” “Sexual,” “Unintelligent,” and “Unregulated/lazy.” Notably, the “Physically fit/athletic” category was also a top stereotype for Black men. However, we excluded this category from the aggregate because past work has shown it is highly related to physical threat-related stereotypes (Wilson et al., 2017).

Ancillary Analyses: Exploring other trait-specific dilution and amplification effects.

For our primary analyses, we were focused on whether Black-threat stereotypes were diluted for obese Black men, and whether this dilution effect occurred on average across Black stereotypes. Given that we did not observe an overall dilution effect for commonplace Black male stereotypes, this may mask the possibility that trait-specific dilution effects and trait-specific amplification effects may occur amongst the various traits that conflict and align amongst the Black male and obese male stereotypes. For instance, the “Unregulated/lazy” trait appears common in stereotype content of both Black men and obese men, such that 30% of participants in the Black male condition and 51% of participants in the obese male condition listed unregulated/lazy traits. Per the MOSAIC model (Hall et al., 2019), when the foundational category (i.e., Black) and the intersectional category (i.e., obese) share stereotype content, this stereotype content should be amplified for targets who are classified into both demographic categories. Using this example, obese Black men may be subject to *amplified* stereotyping along the “Unregulated/lazy” dimension, relative to Black men. Conversely, stereotype traits “Criminal” and “Sexual” may be additional cases where stereotype content between Black men and obese men are in conflict, such that perhaps obese Black men would be subject to diluted stereotyping along these domains. Although the present research was not designed specifically to test this hypothesis, an inspection of the results in Table 2 indicate that the stereotype content of obese Black men is quite complex and aligns perfectly with neither the foundational nor the intersectional category. Thus, amplification or dilution may occur on a trait-by-trait basis, depending on whether that trait is consistent or inconsistent across categories, respectively. To explore this possibility, we tested whether each of the four traits from the “Aggregate Non-Threat Black Stereotypes” showed amplification or dilution on an exploratory basis.

We first investigated stereotype traits where one may predict amplified stereotyping toward obese Black men: “Unregulated/lazy” and “unintelligent” traits. For Black male categories, there was a significant relationship between weight category and unregulated/lazy stereotypes, $\chi^2(1, N = 211) = 12.490, p < .001, F = .339$. Whereas 30% of participants listed unregulated/lazy stereotypes for Black men, 64% of participants listed unregulated/lazy stereotypes for obese Black men. Therefore, obese Black men appear to be subject to amplified stereotyping for the specific stereotype trait that is shared across Black men and obese men. Although not pertinent to the amplification test specifically, there was also a significant relationship between weight category and unregulated/lazy stereotypes for White male categories, $\chi^2(1, N = 211) = 48.494, p < .001, F = .690$. Whereas less than 0.5% of participants listed unregulated/lazy stereotypes for White men, 64% of participants listed these stereotypes for obese White men. Notably, this stereotype trait does not appear shared between White male and obese male categories. Obese White men are robustly stereotyped as unregulated and lazy; however, this stereotype appears virtually nonexistent for White men in our data. For this reason, we do not believe the relationships within White categories should be understood as amplified (or diluted) stereotyping. The remaining trait-level analyses for White categories can be found in the SOM.³

Another stereotype where amplification is possible is the “Unintelligent” trait, which was listed by 43% of participants in the Black male condition and 19% of participants in the obese male condition. For Black male categories, there was a significant relationship between weight category and application of Unintelligent stereotypes, $\chi^2(1, N = 211) = 6.102, p = .014, F = .237$. However, this relationship worked in the opposite direction than expected. Only 21% of

³As detailed in the SOM, perceivers were more likely to list “Unintelligent” stereotypes for obese White men than White men, but no more likely to list “Criminal” or “Sexual” stereotypes.

participants in the obese Black male condition listed unintelligent traits. It is unclear why these results are inconsistent with the possible amplification pattern. The unintelligent stereotype was not quite as prevalent in the obese male category, suggesting perhaps it was not a strong enough stereotype to be considered shared with the robust unintelligent stereotype of Black men.

We next tested for potential dilution effects along the “Criminal” and “Sexual” stereotype traits. Perceivers may hold inconsistent stereotypes of Black men and obese men in these domains. First, criminal stereotypes are arguably closely related to threat, such that stereotypes of obese men as unregulated, lazy, and physically incapable may dilute this threat-related stereotype. Second, “Lonely” stereotypes (e.g., single, unattractive, sexually inactive) and “Physically Disgusting” stereotypes (e.g., dirty, smelly) commonly listed for obese men may contradict the “Sexual” stereotypes of Black men (e.g., promiscuous, sexually active). Therefore, obese Black men may be subject to diluted stereotyping along these traits. Indeed, among Black male categories, there was a significant relationship between weight category and criminal stereotypes, $X^2(1, N = 211) = 19.189, p < .001, F = -.420$. 45% of participants listed Criminal stereotypes in the Black male condition, compared to only 8% of participants in the obese Black male condition. Similarly, there was a significant relationship between weight category and sexual stereotypes in the Black male categories, $X^2(1, N = 211) = 8.672, p = .003, F = -.282$. 23% of participants listed Sexual stereotypes in the Black male condition, compared to only 4% of participants in the obese Black male condition. Therefore, obese Black men appear subject to diluted stereotyping along specific traits that conflict between Black male stereotype content and obese male stereotype content.

Discussion

In Study 1, we found that for Black men, the content of threat-related stereotypes depends on body weight. Participants were less likely to list threat-related characteristics as part of the cultural stereotype of obese Black men, relative to Black men. This is consistent with our hypothesis that stereotypes about weight may directly contradict stereotypes about race, leading to a diluted stereotyping effect (Hall et al., 2019) for this otherwise very common and problematic part of the Black male stereotype.

However, this did not appear to be due to a broad de-racialization effect. Indeed, at the omnibus level, we observed that commonly employed stereotypes of Black men were no less likely to be listed for obese Black men. Instead, our ancillary analyses provided evidence supporting a trait-specific dilution effect, rather than a domain-general de-racialization effect. A de-racialization hypothesis might predict that obese Black men are stereotyped as not only less threatening, but also as less Black-stereotypical more broadly (e.g., less lazy). Instead, the intersection of weight and race produces unique and nuanced stereotyping effects, suggesting that specific threat-related stereotypes are diluted for obese Black men. At likely points of stereotype consistency between the Black male and the obese male stereotype (e.g., laziness; unintelligent), our exploratory analyses were consistent with amplification effects. At points of disagreement in this stereotype content (e.g., sexual; criminal), we saw evidence of dilution effects. In short, whereas aggregate-level analyses show that obese Black men are not broadly de-racialized as less Black-stereotypic, trait-level analyses show that these results show surprising nuance in terms of trait-specific amplification and dilution effects, yet still in a manner broadly consistent with the MOSAIC model.

These results may have important implications for the intersectionality and prototypicality literatures. Individuals who are perceived as less prototypical of their racial

category are often subject to diluted racial stereotyping overall (Blair et al., 2002; Maddox & Gray, 2002). Apparent prototypicality itself is often assessed through these aggregated racial stereotype measures, much as in our present measures (Maddox & Gray, 2002). Through this conceptualization of prototypicality, obese Black men do not appear to be seen as broadly less prototypical of their racial category. Instead, obese Black men are seen as less stereotypic along some racial stereotypes that are inconsistent with obesity stereotypes, but *more* stereotypic along other racial stereotypes that are consistent with obesity stereotypes. In the context of past work that has shown broad categorical effects of prototypicality manipulations (e.g., light skinned Black men, Maddox & Gray, 2002; gay Black men, Petsko & Bodenhausen, 2019a), the present results are quite interesting. Instead of these broad categorical effects, we instead observed trait specific effects of stereotype consistency and inconsistency. This implies that, at least under some situations, people have much more nuanced conceptualizations of prototypicality, represented at the level of the trait rather than at the level of the group, a conceptualization that may help us understand why some apparently emergent stereotype content can emerge at category intersections (e.g., Ghavami & Peplau, 2013). This is a topic to which we return in the General Discussion.

Notably, data from the “obese men” condition was collected after the initial four conditions. This was done to allow for an additional set of comparisons in the data, however a post-hoc control means that these comparisons should be interpreted with some caution, as participants were not randomly assigned to this condition. Mitigating this concern, the obese male condition was not included in the primary analyses and was instead used to descriptively evaluate obese male stereotypes when race was unspecified. These data allowed us to create meaningful predictions by evaluating whether stereotypes were shared (e.g., unregulated/lazy) or

inconsistent (e.g., sexual vs lonely) between Black men and obese men. Further, although race was not specified in the obese male condition, it is likely that participants made assumptions about race. Indeed, perceivers hold a range of cultural “defaults” including race (e.g., White, male, heterosexual) that often influence evaluations of supposedly race-less stimuli (Purdie-Vaughns & Eibach, 2008; Stroessner, 1996). Even still, there are some notable differences between the obese White men and the obese men conditions. For example, when the “White” category was included, participants appeared to generate a stereotype content including entitled, bigoted, and conservative obese White men. This same subset of stereotypes was not activated to the same degree for obese men whose race was unspecified. It is possible that explicitly including the “White” category may have activated these race-relevant stereotypes to a greater degree (and indeed, they were applied to the greatest extent in the White male condition).

Finally, we also observed that perceivers applied more non-threat Black stereotypes to obese White men than White men. Trait-level analyses (see SOM) revealed that this was primarily due to an increased tendency to stereotype obese White men as unregulated, lazy, and unintelligent. These stereotypes may be prevalent for both Black men and obese men. That is, although it appeared that obese White men were seen as more Black-stereotypic, it is possible they were simply stereotyped along obesity-relevant content that happens to be shared with Black stereotype content. Alternatively, perhaps obese White men were stereotyped as broadly more negative, which implicated certain traits (but not others: i.e., sexual) relevant to non-threat Black stereotypes.

Although the stereotype listing data in Study 1 provides insight into participants’ representations of cultural stereotypes, there is also a great deal of variability in responding. Further, although the trait listing method is a classic means of measuring stereotype content, it

relies on a decontextualized mental representation which may or may not be applied to a specific exemplar. Finally, although the specific test of the dilution effects for the Black male threat stereotypes were made a priori, additional tests of de-racialization were made on an exploratory basis and on traits generated spontaneously by participants. Indeed, constraining participants to list only five traits for a group may also produce unique effects. In Study 2, we adopted a different technique to investigate stereotyping at the intersection of race and weight.

Study 2

In Study 2, we adopted an experimental method designed to offset some limitations of Study 1. Here, participants viewed a series of images of Black and White obese and average-weight men. Participants rated the extent to which multiple traits were part of the cultural stereotype of each person. These traits included both non-threat traits and threat traits shown to be stereotypic of Black men in past work. Specifically, we selected traits that were well-validated in prior work (Petsko & Bodenhausen, 2019a), and are particularly reflective of Black cultural stereotypes. Some of these traits were general non-threat traits (e.g., rhythmic) and others were specifically threat related (e.g., aggressive). The non-threat traits were not obviously consistent or inconsistent with obesity stereotypes leading to the prediction of neither amplification nor dilution effects along these traits. However, for the threat-related traits, we again predicted that perceivers would believe threat and aggression traits are less stereotypical of obese Black men, relative to average-weight Black men. Because we did not find evidence for a broader de-racialization of obese Black men, we predicted that obese Black men would still be judged as Black-stereotypic more broadly, but as uniquely less threatening.

Notably, unknown to participants, targets were selected from the “before” (obese) and “after” (average-weight) images of men who had undergone a significant weight-loss program.

The presentation of each identity was counterbalanced across weight such that each man was presented as only obese or as average-weight. This provides the benefit of holding target identity constant to eliminate possible confounds between identity and weight that are often present when using real images.

Method

Participants

We conducted an *a priori* sensitivity analysis using G*Power for repeated-measures ANOVAs (within-factors) for Studies 2 and 3, targeting 60 participants with a criterion of $\alpha = .05$ to detect 80% power, with the default correlation between repeated measures at $r = .5$. This sensitivity analysis determined that 60 participants would be sufficient to detect a minimum effect size of $\eta_p^2 = .03$, with critical $F = 4.004$. In total, 60 U.S. participants from MTurk ($M_{age} = 36.82$, $SD_{age} = 11.56$) completed the study.

Materials and Procedure

Stimuli consisted of pictures of 12 men (6 Black, 6 White) posted online. Each of these men had participated in a weight loss program, with pictures taken both before weight loss (i.e., while appearing obese) and after weight loss (i.e., while appearing average-weight), for 24 total images. Images were cropped to show each man's body from the shoulders down, eliminating identifying facial information. However, target race was visible from exposed skin. Targets were pictured in black shorts and t-shirts or tank tops, which were digitally edited to remove logos.

Participants were told that we were interested in current societal stereotypes about people from different groups (Petsko & Bodenhausen, 2019a). Participants then viewed the body images one at a time in random order. Target images were counterbalanced, such that participants saw a given target only once, either before or after weight loss, but saw an equal number of targets who

were Black and White, and who were obese and average-weight. For each body, participants rated the extent to which six traits were part of the cultural stereotype of the person on a 7-point scale ($1 = \text{Not at all}$; $7 = \text{Very much}$). Four of these traits were general stereotypes about Black men (i.e., loud, rhythmic, ostentatious, poor), which were taken directly from Petsko and Bodenhausen's (2019a) five traits listed as most stereotypic for Black Americans. We added two traits representing specific threat stereotypes of Black men (i.e., threatening, aggressive). After all ratings were made, participants were debriefed and compensated.

Results

We first created two mean variables: a composite of non-threat stereotypes (i.e., loud, rhythmic, ostentatious, and poor; $\alpha = .70$), and a composite of threat stereotypes (i.e., threatening and aggressive; $\alpha = .88$). We then conducted a 2 (target race: Black, White) x 2 (target weight: average, obese) x 2 (trait type: non-threat, threat) repeated-measures ANOVA. There was a significant main effect of target race, $F(1,59) = 17.045, p < .001, \eta_p^2 = .224$. The main effects of target weight, $F(1,59) = 0.097, p = .757, \eta_p^2 = .002$ and trait type, $F(1,59) = 3.562, p = .064, \eta_p^2 = .057$, were not significant.

Significant two-way interactions emerged between target race and weight, $F(1,59) = 17.451, p < .001, \eta_p^2 = .228$, and target weight and trait type, $F(1,59) = 14.022, p < .001, \eta_p^2 = .192$. However, the interaction between target race and trait type was not significant, $F(1,59) = 3.180, p = .080, \eta_p^2 = .051$.

Importantly, all of these effects were qualified by a significant three-way interaction between target race, target weight, and trait type, $F(1,59) = 10.709, p = .002, \eta_p^2 = .154$ (see Figure 1).

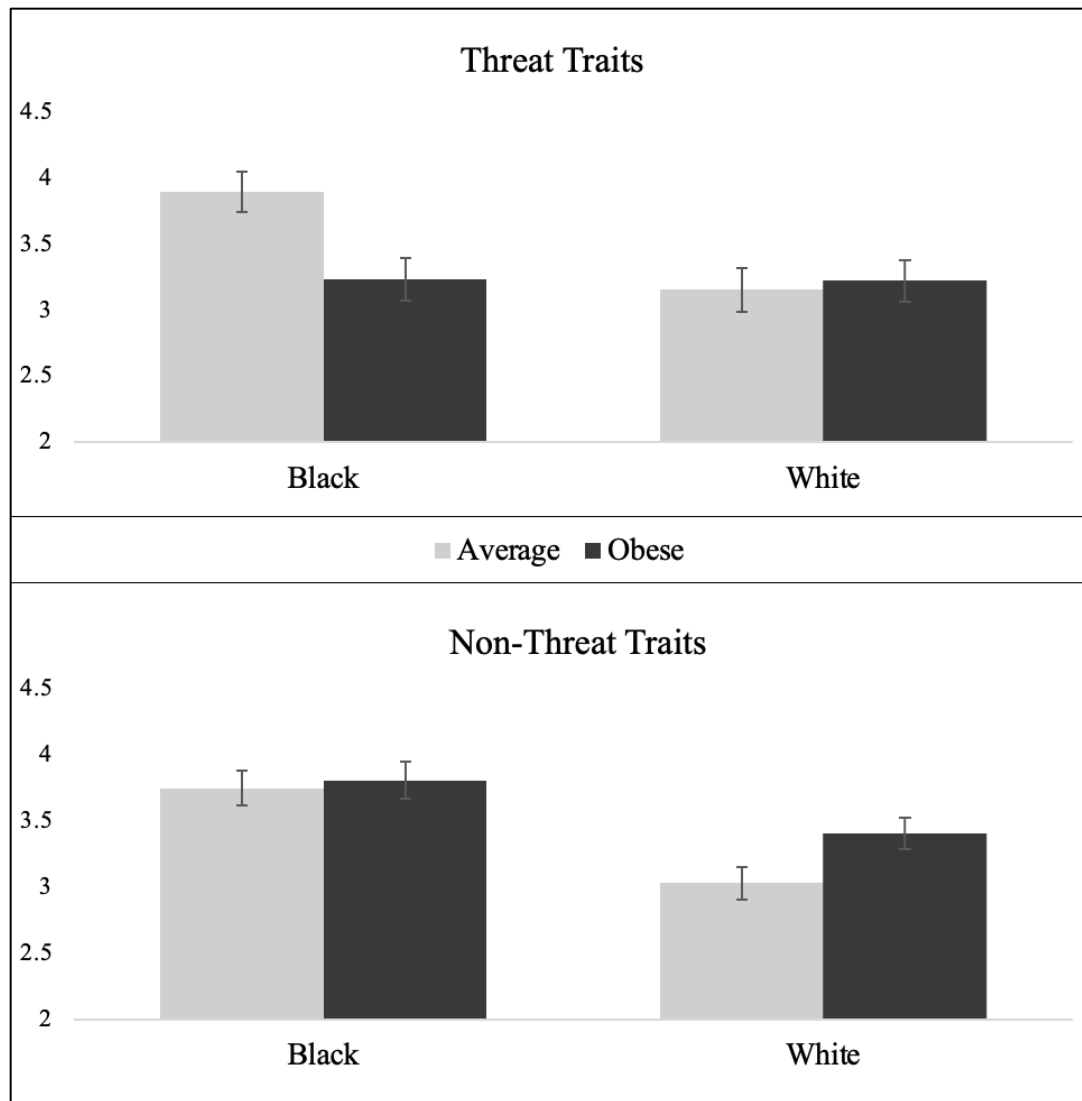


Figure 1. Interaction between target race, target weight, and trait type. Threat-related traits were seen as less stereotypic of obese Black men, relative to average-weight Black men. However, non-threat-related traits were seen as similarly stereotypic of obese and average-weight Black men. Error bars represent SEM.

To decompose this interaction, we conducted two separate race x weight repeated-measures ANOVAs for threat and non-threat traits. For threat traits, we observed a significant interaction between race and weight, $F(1,59) = 20.395, p < .001, \eta_p^2 = .257$. Consistent with the

threat dilution hypothesis, threat traits were seen as less stereotypic of obese Black targets ($M = 3.23$, $SD = 1.26$) than average-weight Black targets ($M = 3.90$, $SD = 1.18$), $t(59) = 3.531$, $p = .001$, 95% CI [0.29, 1.04], $d = 0.46$. However, there was no significant difference in perceived threat stereotypicality between obese White targets ($M = 3.22$, $SD = 1.21$) and average-weight White targets ($M = 3.15$, $SD = 1.26$), $t(59) = -0.425$, $p = .672$, 95% CI [-0.40, 0.26], $d = -0.06$. This interaction could also be decomposed to show racial bias in perceived threat stereotypicality within each target weight category. Threat traits were seen as more stereotypic of average-weight Black targets than average-weight White targets, $t(59) = 4.441$, $p < .001$, 95% CI [0.41, 1.08], $d = 0.57$. However, racial bias in perceived threat stereotypicality was eliminated when targets were obese, $t(59) = 0.072$, $p = .943$, 95% CI [-0.30, 0.32], $d = 0.01$.

We next investigated non-threat traits. There was a significant interaction of target race and weight on perceived non-threat stereotypicality, $F(1,59) = 7.475$, $p = .008$, $\eta_p^2 = .112$. Consistent with a threat-specific dilution hypothesis, there was no significant difference in perceived non-threat stereotypicality between obese Black targets ($M = 3.81$, $SD = 1.07$) and average-weight Black targets ($M = 3.75$, $SD = 1.02$), $t(59) = -0.399$, $p = .692$, 95% CI [-0.36, 0.24], $d = -0.05$. Conversely, non-threat Black-stereotypic traits were seen as more stereotypic of obese White targets ($M = 3.40$, $SD = 0.91$) than average-weight White targets ($M = 3.03$, $SD = 0.98$), $t(59) = -2.645$, $p = .010$, 95% CI [-0.66, -0.09], $d = -0.34$. This finding for White targets is consistent with the pattern of data in Study 1, suggesting that certain negative (but non-threat) stereotypes often applied to Black people also appear to be part of the cultural stereotype of obese White targets.

Discussion

Threat-specific traits were considered less stereotypic of obese than average-weight Black men. However, Black men regardless of weight were stereotyped similarly across other, non-threat related traits (e.g., loud). Thus, perceivers did not appear to engage in a category-level de-racialization of obese Black men. Instead, we observe a trait-specific dilution of just these threat stereotypes in conflict for Black and obese men. These results conceptually replicated the trait-specific dilution hypothesis observed in Study 1. A distinct pattern of results emerged for White targets, broadly replicating the finding from Study 1 that stereotypes of obese White men included more non-threat Black-stereotypic traits than average-weight White men, although threat-related stereotype content did not differ. These findings may reflect a broad negativity halo toward obese White individuals (see SOM for further discussion and trait-level analyses). Indeed, perceivers tend to ascribe more negative traits to obese people (e.g., Brodsky, 1954; Hu et al., 2018). In our study, the stereotypes of negative, non-threat traits (e.g., loud) may fall under this broader tendency to ascribe negative attributes to obese individuals.

The design of Study 2 addressed a number of potential methodological concerns in Study 1. First, by adopting a paradigm that shows participants targets varying in weight, this addresses the possibility that participants did not spontaneously think of a fit exemplar in the absence of the “obese” category label. Instead of category labels, both race and weight were visually apparent in the stimuli themselves. Second, Study 2 relied on Likert ratings of stereotypic items validated in previous research, rather than coding participants’ free responses. Although Study 2 loses the ability to explore whether amplification and dilution effects occur for non-focal (i.e., non-threat) traits, by allowing participants to rate traits on how stereotypic they seemed of men at the intersection of race and weight, this allows us to more directly investigate whether stereotypes of Black men validated in prior work were also seen as stereotypic of obese Black men. Despite

these methodological differences across studies, we replicated the threat-specific stereotype dilution toward obese Black men observed in Study 1. Replicating the same pattern of data across two disparate measures and methods increases confidence in the results.

Study 3

Across Studies 1 and 2, we observed that threat stereotypes commonly applied to Black men are diluted for obese Black men. In Study 3, we investigated a downstream consequence of these cultural stereotypes. Past research has reliably demonstrated that the threat stereotype targeting Black men can engender concern amongst White perceivers for safety in both real and simulated interactions (e.g., Hester & Gray, 2018; Donders et al., 2008) and can relate to Whites' willingness to endorse police force to regulate the behavior of Black civilians in police-civilian conflicts (Wilson et al., 2017). Here, we investigate whether these downstream effects of threat stereotyping are also diluted toward obese Black men. Further, whereas Studies 1 and 2 allowed participants to acknowledge cultural stereotypes without endorsing them, Study 3 asks participants to instead make more personal judgments. That is, Study 3 will investigate whether the threat-based stereotype dilution observed in prior studies will also be reflected in participants' actual responses to men at the intersection of race and weight.

We tested these questions with two different dependent variables indirectly assessing threat stereotypes and their downstream consequences. First, in Study 3a, participants viewed Black and White targets, both obese and average-weight, and rated how threatened they would be if each man were approaching them at night while they were walking towards their car. Second, in Study 3b, we employed the same paradigm and participants also rated how justified police use-of-force would be to regulate the behavior of each man if they were behaving aggressively toward a police officer (Wilson et al., 2017).

Consistent with the trait-specific dilution observed in previous studies, we predicted an interaction between race and weight, such that the threat-based consequences (i.e., anticipated threat and justification of force) targeting Black men would be diluted when these men were obese. Given that threat is not a strong stereotype of White men, we had no prediction for how weight would relate to anticipated threat and justification of force toward White men.

Study 3a

Method

Participants. We continued to rely on the sensitivity analysis from Study 2 indicating that 60 participants would be sufficient to detect a minimum effect size of $\eta_p^2 = .03$ in a within-subjects design. Sixty participants living in the U.S. from MTurk ($M_{age} = 33.98$, $SD_{age} = 9.17$) completed the study.

Procedure. Participants viewed the male Black and White bodies from Study 2, pictured before and after weight loss. Target images were counterbalanced, such that participants saw a given target only once, either before or after weight loss, but saw an equal number of targets who were Black and White, and who were obese and average-weight. Participants were told to imagine that he was approaching them at night while they were walking towards their car. Participants indicated how threatened they would feel on a 7-point scale ($1 = \text{Not at all threatened}$; $7 = \text{Very threatened}$). Participants then provided demographic information and were debriefed.

Results

We tested the interaction of target race and weight on anticipated threat by conducting a 2 (target race: Black, White) x 2 (target weight: average, obese) repeated-measures ANOVA. This

ANOVA yielded a significant main effect of race, $F(1,59) = 21.774, p < .001, \eta_p^2 = .270$, and a significant main effect of weight, $F(1,59) = 9.594, p = .003, \eta_p^2 = .140$.

These main effects were qualified by an interaction between target race and weight, $F(1,59) = 18.948, p < .001, \eta_p^2 = .243$ (see Figure 2). As predicted, perceivers anticipated being significantly more threatened by average-weight Black targets ($M = 4.41, SD = 1.66$) than obese Black targets ($M = 3.57, SD = 1.74$), $t(59) = 4.117, p < .001, 95\% CI [0.43, 1.25], d = 0.53$. However, perceivers' threat responses to average-weight White ($M = 3.66, SD = 1.44$) and obese White targets ($M = 3.33, SD = 1.61$) did not significantly differ, $t(59) = 1.703, p = .094, 95\% CI [-0.06, 0.70], d = 0.22$.

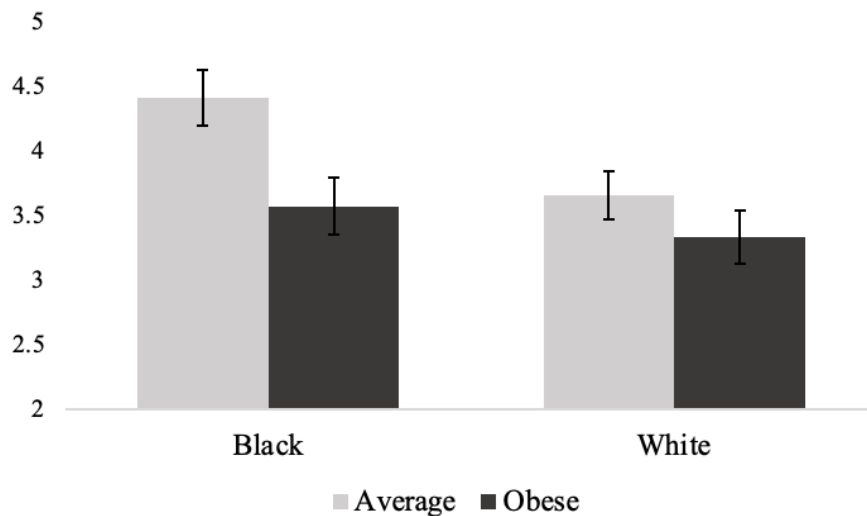


Figure 2. Interaction between target race and target weight on anticipated threat in Study 3a. Obese Black men are judged as less threatening than average-weight Black men, but obesity does not significantly moderate the perceived threat of White men. Error bars represent SEM.

As a consequence of diluted threat stereotyping, racial bias in perceived threat was also attenuated for obese targets. Participants anticipated feeling significantly more threatened by

average-weight Black than average-weight White targets, $t(59) = 5.120, p < .001$, 95% CI [0.38, 0.94], $d = 0.66$. Participants also anticipated feeling significantly more threatened by obese Black than obese White targets, $t(59) = 2.675, p = .010$, 95% CI [0.08, 0.60], $d = 0.35$, although the effect size is smaller.

Discussion

In Study 3a, we experimentally replicated our Black-threat stereotype dilution effect at the intersection of race and weight. In imagined scenarios, participants believed they would be more threatened by average-weight Black men than obese Black men. That is, participants' feelings about an imagined interaction map on to their representations of cultural stereotypes observed in Studies 1 and 2. For White men, obesity does not cue diluted stereotyping effects, as even fit White men are not subject to heightened threat stereotypes compared to obese White men.

Study 3b

In Study 3b, we directly replicate our method from Study 3a, while also extending to a downstream consequence of threat biases: justifications for police-use-of-force. White Americans often endorse more police force to regulate the behavior of Black men, relative to White men, an effect that is predicted by the tendency to over-perceive Black men's physical formidability (Wilson et al., 2017). Of interest is whether the threat dilution effect in the previous studies is also observable in endorsement of police force against Black men.

Participants completed the procedure from Study 3a, and then in a separate block of ratings, imagined the same men were behaving aggressively toward an officer, rating how much force would be appropriate to subdue them. We hypothesized that police force would be seen as less justified toward obese Black than average-weight Black men.

Method

Participants and Procedure. Eighty U.S. workers from MTurk ($M_{age} = 34.91$, $SD_{age} = 10.30$) completed the study.

The procedure was identical to Study 3a except as noted. After completing the anticipated threat measure for each target, participants completed a new block of measures. Participants viewed the same targets a second time and were told to imagine each man had behaved aggressively toward a police officer but was not wielding a weapon (identical to the procedure from Wilson et al., 2017). Participants then rated the extent to which it would be appropriate for police to use force to subdue him on a 7-point scale ($1 = \text{Not at all appropriate}$; $7 = \text{Very appropriate}$).⁴

Results

We first tested whether we would replicate the diluted threat stereotyping observed in Study 3a. We conducted a 2 (target race: Black, White) x 2 (target weight: average, obese) repeated-measures ANOVA on anticipated threat. This analysis had 80% power (at $\alpha = .05$ and repeated measures correlations at $r = .5$) to detect a minimum effect size of $\eta_p^2 = .02$, with critical $F = 3.962$. As expected, we replicated the significant main effects of target race, $F(1,79) = 45.648$, $p < .001$, $\eta_p^2 = .366$, and target weight, $F(1,79) = 15.026$, $p < .001$, $\eta_p^2 = .160$, on threat responses. These main effects were qualified by a significant interaction between target race and weight, $F(1,79) = 13.162$, $p = .001$, $\eta_p^2 = .143$. Perceivers anticipated being more threatened by average-weight Black targets ($M = 4.15$, $SD = 1.49$) than obese Black targets ($M = 3.38$, $SD = 1.64$), $t(79) = 4.758$, $p < .001$, 95% CI 0.45, 1.09], $d = 0.53$. Unlike prior studies, perceivers also anticipated being more threatened by average-weight White ($M = 3.38$, $SD =$

⁴ An replication of these effects of target race and weight on justification of police force can be found in the SOM (Supplemental Study 1).

1.30) than obese White targets ($M = 3.04$, $SD = 1.49$), $t(79) = 2.269$, $p = .026$, 95% CI [0.04, 0.63], $d = 0.25$, although this effect was smaller than amongst Black targets. Once again, this dilution effect implicated racial bias in anticipated threat. Perceivers anticipated being more threatened by average-weight Black targets than average-weight White targets, $t(79) = 7.424$, $p < .001$, 95% CI [0.56, 0.98], $d = 0.83$. The same racial bias was weaker but still significant for obese targets, $t(79) = 3.359$, $p = .001$, 95% CI [0.14, 0.53], $d = 0.38$.

Of primary interest was whether we would observe a similar intersectional stereotype of race and weight on justifications of police force. We found significant main effects of target race, $F(1,79) = 15.165$, $p < .001$, $\eta_p^2 = .161$, and target weight, $F(1,79) = 6.084$, $p = .016$, $\eta_p^2 = .072$, on perceived appropriateness of police force. These main effects were qualified by a significant interaction between target race and weight, $F(1,79) = 9.460$, $p = .003$, $\eta_p^2 = .107$ (see Figure 3).

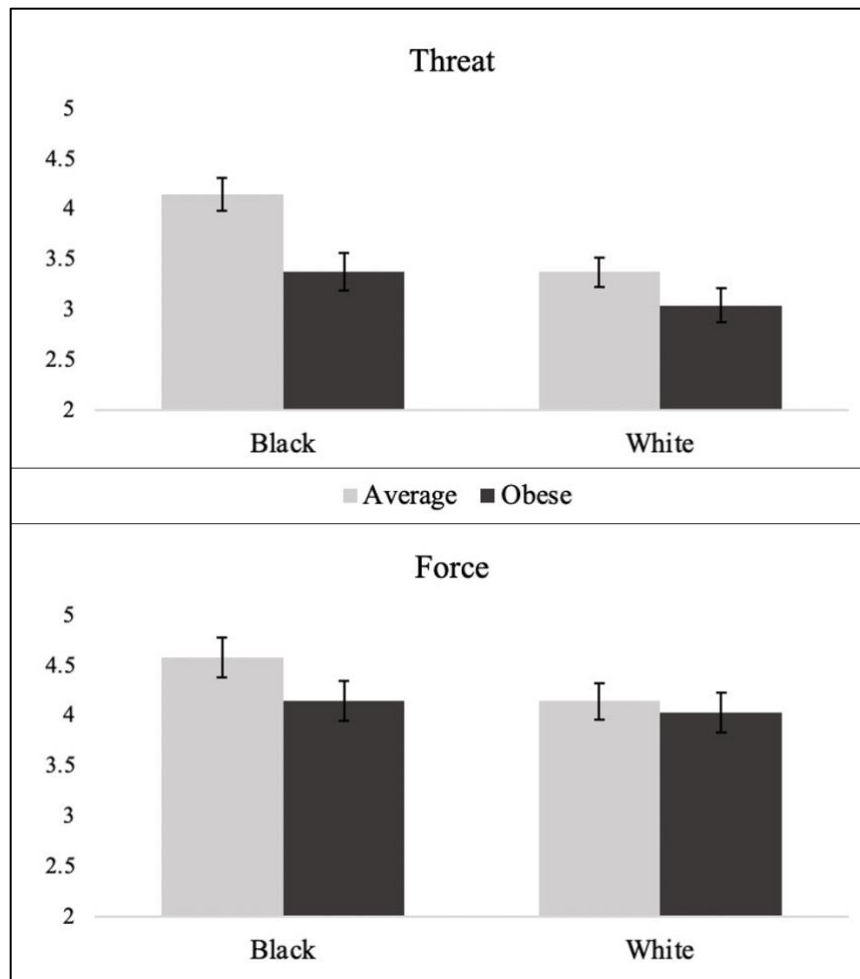


Figure 3. Interactions between target race and target weight on anticipated threat (top panel) and justification of police force (bottom panel) in Study 3b. Obese Black men were judged as less threatening, and police force was seen as less justified toward them, relative to average-weight Black men. Error bars are represented by SEM.

Consistent with Wilson and colleagues' (2017) findings, participants rated police force as significantly more appropriate towards average-weight Black ($M = 4.58$, $SD = 1.80$) than average-weight White ($M = 4.14$, $SD = 1.66$) targets, $t(79) = 4.134$, $p < .001$, 95% CI [0.23, 0.65], $d = 0.46$. However, this difference was non-significant for obese Black ($M = 4.15$, $SD =$

1.75) and White ($M = 4.03$, $SD = 1.80$) targets, $t(79) = 1.766$, $p = .081$, 95% CI $[-0.01, 0.25]$, $d = 0.20$.

Notably, participants believed police force was more appropriate toward average-weight than obese Black targets, $t(79) = 4.045$, $p < .001$, 95% CI $[0.22, 0.64]$, $d = 0.45$. For White targets, there was no significant difference in perceived appropriateness of force for average-weight and obese targets, $t(79) = 0.809$, $p = .421$, 95% CI $[-0.16, 0.37]$, $d = 0.09$. Therefore, the threat stereotype, and its downstream consequence, are uniquely diluted toward obese Black men.⁵

Discussion

Taken together, our primarily White perceivers anticipated feeling less threatened by obese Black men, and believed police force was less justified toward them, compared to average-weight Black men. Whereas Black men are stereotyped as highly threatening, an effect with impactful real-world consequences (e.g., Eberhardt et al., 2006; Hester & Gray, 2018), here we find that this threat stereotyping is diluted toward obese Black men. Thus, threat stereotyping of Black men is best understood as a conjunction of race and weight. When weight stereotypes are in conflict with Black stereotypes, threat-based stereotypes are diluted, but not eliminated.

Importantly, these findings do not speak directly to real-world force decisions made by police, nor do they suggest that obese Black men are not subject to disparate police mistreatment. These are not real police-civilian interactions, which require different measurement, models, and theory to understand (e.g., Voigt et al., 2017). Further, although obese Black men may be stereotyped as less threatening, this does not eliminate the pernicious and deleterious consequences of stereotyping. Instead, obese Black men are targeted with other intersectional

⁵ See SOM for ancillary analyses investigating how anticipated threat mediates the relationship between target characteristics (weight and race) and justification of police use-of-force.

stereotypes that themselves could have serious consequences. For instance, in Study 1 obese Black men were most frequently assigned cultural stereotypes of lacking self-regulation, a key component of discrimination against heavier-weight individuals (Puhl et al., 2015). Context can also inhibit or activate stereotypes oppressing individuals belonging to multiple stigmatized categories (Petsko & Bodenhausen, 2020), suggesting that the context in which perceivers encounter men at the intersection of weight and race can affect activation of stereotypes. For instance, in some situations in which perceivers encounter Black exemplars, the “race” category may be particularly salient, inhibiting stereotypes (and dilution effects) associated with weight categories.

Thus, rather than speaking to real racial disparities in police force, we instead find that primarily White perceivers in this ambiguous context may not believe obese Black men have the physical and psychological capacity to enact aggression relative to their average-weight counterparts. These trait-specific dilution effects are visible at the intersection of race and weight.

General Discussion

Across 3 studies, we found that obese Black men are subject to diluted threat stereotyping. Our primarily White participants were less likely to list threat-related traits as part of the cultural stereotype of obese Black men (Study 1), less likely to apply threat stereotypes to obese Black men (Study 2), and anticipated feeling less threat from obese Black men (Study 3), relative to average-weight Black men. This dilution was not attributable to a broad “de-racialization” of Black targets (Studies 1 and 2). Further, diluted threat stereotyping had downstream consequences for the sanctioning of police violence: police use-of-force was seen as

more appropriate toward average-weight Black men, relative to obese Black men (Study 3b). Taken together, these results are consistent with a threat-specific dilution hypothesis.

Whereas our work intentionally focused on threat-specific stereotype dilution, we also found preliminary evidence suggesting that obese Black men may be subject to both amplified *and* diluted threat stereotyping at the trait level. At points of overlap between the Black male stereotype and the obese male stereotype, we saw evidence for stereotype amplification. For instance, both Black men and obese men were robustly stereotyped as unregulated and lazy. Conversely, at points of inconsistency between stereotype content, we observed some evidence of stereotype dilution. In Study 1, this occurred not just for threat stereotypes, but also for other domains as well. For instance, whereas Black men were stereotyped as sexual (e.g., sexually active; well-endowed), obese men were stereotyped as lonely (e.g., sexually inactive; unattractive). We observed that obese Black men were subject to diluted sexual stereotypes relative to Black men. Finally, we found evidence for neither amplification nor dilution when the traits were unique to one identity (e.g., loud; Study 2). These nuanced findings suggest that physical threat may be just one of various traits along which obese Black men are subject to diluted stereotyping, but that the presence of stereotype dilution in one trait domain need not elicit dilution in all trait domains. The present work focused primarily on physical threat stereotypes because of their dominance in the race-based stereotyping literature (e.g., Duncan, 1976; Donders et al., 2008; Eberhardt et al., 2004; Todd et al., 2016; Wilson et al., 2017), such that it is integral to understand how these robust and consequential stereotypes operate across intersectional categories. However, the preliminary findings of Study 1 suggest that stereotype dilution and amplification may occur separately at the trait level, rather than only in an omnibus manner at the category level, which seems to be a novel observation.

These present findings also raise the question of *why* we observed trait-specific dilution effects, rather than broad de-racialization as has been observed in some recent work (e.g., Petsko & Bodenhausen, 2019a). There are notable differences between the present work and past work that may explain seemingly disparate findings. First, Petsko and Bodenhausen (2019a) focused on men at the intersection of race and sexual orientation, based on the premise that racial prototypicality *assumes* heterosexuality (i.e., perceivers do not consider these categories orthogonally). As such, gay Black men are seen as broadly less prototypic of their racial categories. In essence, there is a strong stereotype overlap in this domain (see Johnson et al., 2012). In contrast, perhaps weight does not disturb perceptions of racial prototypicality broadly construed. Whereas perceivers may have a default assumption that Black men are physically fit when weight is unspecified, as evidenced in Study 1 (see also Wilson et al., 2017), perceivers may also hold a prevalent subtype of obese Black men, without necessarily seeing obese Black men as broadly less racially prototypical. From this perspective, perhaps not all intersecting categories reduce the prototypicality of a *target* in the foundational category. Instead, perhaps the intersecting categories reduce the prototypicality of some *traits* in the foundational category. Another possibility is that the stereotypes in conflict between Black and obese men are less starkly conflictual than the stereotypes in conflict between Black men and gay men. Whereas Black men are commonly stereotyped as masculine and poor, gay men are stereotyped as feminine and affluent. Perhaps the stereotypes in conflict in Petsko and Bodenhausen's (2019a) work are particularly central to the Black male and gay male stereotypes, and thus have more profound effects on the perceived prototypicality of gay Black men. More broadly, these trait-level findings are quite interesting taken in the context of research on prototypicality, which is often considered at the level of categories rather than traits. For example, the work manipulating

racial phenotypicality (Blair et al., 2002; Deska et al., 2020; Maddox & Gray, 2002) has shown that manipulations of phenotypes (e.g., skin tone) have broad effects across various trait. To our knowledge, the literature on prototypicality has not yet conceptualized how prototypicality can be understood on the trait level. Yet, the present data indicate that prototypicality at the intersection of multiple stigmatized categories can, at least at times, have trait-specific effects.

Despite the fact that we observed trait-specific rather than domain general effects, we see the present findings as broadly consistent with the MOSAIC model (Hall et al., 2019). At points of intersections between the foundational and intersecting categories that create inconsistent stereotype content, we observed patterns of dilution effects. Most centrally to our foci in the present work, Black men are robustly stereotyped as physically threatening. Conversely, obese men were stereotyped as physically incapable, evidenced in qualitative responses in Study 1 and prior work (Sim et al., 2021). Although beyond the scope of the present research, an important question for future research will be understanding when intersectional stereotyping will produce trait-specific dilution versus broad stereotype dilution.

Limitations and Future Directions. The present investigation has a number of limitations which offer novel questions for future exploration. First, these studies utilized only male targets. This was intentional: much of the research on Black-threat stereotypes and racial biases in physical formidability have focused on Black men (e.g., Donders et al., 2008; Hester & Gray, 2018; Wilson et al., 2017). However, research indicates that Black women (Thiem et al., 2019) and Black children (Goff et al., 2014; Halberstadt et al., 2018; Riddle & Sinclair, 2019) are also stereotypically associated with threat, suggesting similar effects may occur across gender and age. A more fully intersectional approach would allow for greater generalizability or uniqueness of these findings at the intersection of race, weight, gender, and age. We also did not test how

participant-level variables relate to responses. Of considerable interest in future research is the extent to which Black perceivers have distinct representations of Black men. In one closely analogous case, Wilson and colleagues (2017) found that Black perceivers believed Black men to be more physically formidable than comparably sized White men but did not translate formidability into threat. Thus, it seems likely that Black participants show a quite distinct pattern of stereotype representation at the intersection of race and weight. Of similar interest is whether individual differences in prejudice or stereotype strength might predict the strength of the present effects.

One benefit of the design of the latter studies is that targets were tightly controlled. In Studies 2 and 3, the same person was presented before and after weight loss, ensuring that any differences between the obese and average-weight targets could not be ascribed to target identity. However, this does limit the number of stimuli that we could employ to these tightly matched cases, which also limits the analytic strategies available. For example, the statistical power of designs treating stimuli as a random factor are bounded both by the number of participants and the number of stimuli (Judd et al., 2017), making the present design under-powered for such tests. Future research could benefit from addressing this limitation, potentially by utilizing computer-generated targets matched for exact size, only differing in apparent race. However, the real stimuli used here do benefit from stronger ecological validity, relative to computer-generated counterparts. Further, Study 1 allowed us to demonstrate that the threat-based dilution effects occur in the absence of images and when producing stereotype representations from category labels alone.

We also focused primarily on how race-based stereotypes may be differently applied depending on weight. That is, we treated race as the foundational demographic characteristic,

and investigated how racial stereotypes differed across weight as the intersectional demographic characteristic (Hall et al., 2019). We believe that this is justified given the putative centrality of race in spontaneous stereotyping effects (e.g., Brewer, 1988; Stangor et al., 1992), and affected our design choices, such as the threat framing in Study 3. However, one could also investigate how weight-based stereotypes may be differently applied depending on race. For instance, obese men are stereotyped as physically incapable, whereas Black men are stereotyped as physically fit and athletic. Because of these inconsistent stereotypes, perhaps the obesity stereotype of physical incapacity would be diluted when targets are Black, compared to White. Of course, in this context, the stimuli and framing of the work would likely require different measures to detect the salient effects of this different framing. The present work focused only on race-based stereotyping as a function of weight, and thus was not intended to speak to these questions about weight-based stereotypes. However, we do find evidence that trait (in)consistencies may produce unique stereotyping effects across intersectional categories (Hall et al., 2019), and we believe this may have important extensions to other foundational demographic categories (e.g., obesity).

Conclusion

Taken together, we see the present findings as valuable for multiple reasons. First, they follow from advances in theories of intersectionality, focusing on how social categories intersect to generate unique discriminatory responses (e.g., Crenshaw, 1989; Purdie-Vaughns & Eibach, 2008; Remedios & Sanchez, 2018), and little research on obesity stigma has focused on people of color as targets of judgment (Himmelstein et al., 2017; *cf.* Hebl & Heatherton, 1998; Hebl & Turchin, 2005). Second, the current work extends our understanding of how intersectional stereotypes are applied depending on overlapping or conflicting stereotype content. Indeed, a great deal of research has demonstrated that people who are seen as less prototypical of their

category are judged as less stereotypic of that category broadly (e.g., Blair et al., 2002; Blair et al., 2004; Eberhardt et al., 2004; Dixon & Maddox, 2005; Hall et al., 2019). In the present work we extend these findings to show that such diluted stereotyping effects can be trait-specific. Rather than conflicting stereotypes leading to de-racialization or perceived non-prototypicality overall (e.g., Petsko & Bodenhausen, 2019a), we highlight a case in which the dilution may be specific to the stereotypes in conflict between two intersecting categories. These findings may inform future research in investigating when and why contradicting stereotypes lead to broad category non-prototypicality versus trait-specific dilution. Finally, the present research focuses on a real social problem. These intersectional stereotypes have real-world consequences, such as public sanctioning of police use-of-force. Understanding how racialized threat stereotypes operate and their consequences is a pressing undertaking.

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