Supporting Information

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Pilot Study: Cultural Stereotypes About Height and Race

One of the best ways to assess whether a cultural stereotype exists is to simply ask people what stereotypes they know, rather than asking them what stereotypes they endorse (1). We predicted that participants from a nationally representative sample would express knowledge that tallness amplifies threat stereotypes more for Black men than White men but amplifies competence stereotypes more for White men than Black men.

For four target groups (short White male, short Black male, tall White male, tall Black male), participants rated the extent to which 13 adjectives were part of that group's cultural stereotype using a six-point scale (1 = not at all part of the stereotype; 6 = a very strong part of the stereotype). Adjectives reflecting potential competence (e.g., competent, skilled) and potential threat (e.g., threatening, dangerous) were combined to form indices of competence and threat.

We analyzed the data using a hierarchical linear model with responses nested within participant to account for between-participant variation in responses. We predicted both threat and competence stereotypes using target race and target height.

Target Race. Threat was more central to Black stereotypes (M = 3.79) than to White stereotypes (M = 2.72), b = 1.06, $F(1, 950)$ = 306.66, $P < 0.001$, 95% CI [0.95, 1.18]. Competence was more central to White stereotypes (M = 3.69) than to Black stereotypes (M = 3.07), b = 0.62, $F(1, 950)$ = 161.87, $P < 0.001$, 95% CI [0.52, 0.73].

Target Height. Threat was also more central to tall stereotypes (M = 3.53, 95% CI [3.41, 3.65]) than to short stereotypes (M = 2.98, 95% CI [2.86, 3.10]), b = 0.55, $F(1, 950)$ = 80.75, $P < 0.001$, 95% CI [0.43, 0.67]. Competence was more central to tall stereotypes (M = 3.59) than to short stereotypes (M = 3.16), b = 0.43, $F(1, 950)$ = 76.84, $P < 0.001$, 95% CI [0.33, 0.52].

Race by Height Interaction. Importantly, we predicted that height effects on stereotypes would differ by race. We expected that height would influence threat stereotypes more strongly for Black targets and would influence competence stereotypes more strongly for White targets.

Ratings of threat also showed the predicted target race by target height interaction, b = 0.30, $F(1, 950)$ = 5.95, P = 0.015, 95% CI [0.06, 0.53], such that target height had an especially larger effect on threat ratings for Black targets, M_{diff} = 0.69, 95% CI [0.53, 0.86], than for White targets, M_{diff} = 0.40, 95% CI [0.23, 0.57]. These results suggest the existence of a cultural stereotype that tallness increases perceived threat more for Black men than for White men.

Ratings of competence also showed the predicted target race by target height interaction, b = 0.34, $F(1, 168)$ = 12.45, $P < 0.001$, 95% CI [0.15, 0.53], such that target height had a larger effect on competence ratings for White targets, M_{diff} = 0.60, 95% CI [0.46, 0.73], than for Black targets, M_{diff} = 0.26, 95% CI [0.12, 0.39]. These results suggest the existence of a cultural stereotype that tallness increases perceived competence more for White men than for Black men (Fig. 2).

Participant Race and Gender. Black participants showed a stronger main effect of race for threat, b = 0.71, $F(1, 947)$ = 16.94, $P < 0.001$, 95% CI [0.36, 1.07], such that, compared with non-Black participants, they perceived that Black people were more strongly stereotyped as threatening, b = 0.76, $F(1, 534)$ = 18.61, $P < 0.001$, 95% CI [0.41, 1.10]. Black participants also showed a stronger main effect of race for competence, b = −0.58, $F(1, 947)$ = 16.94, $P < 0.001$, 95% CI [−0.86, −0.29], such that, compared with non-Black participants, they perceived that White people were more strongly stereotyped as competent, b = 0.54, $F(1, 447)$ = 10.12, P = 0.002, 95% CI [0.21, 88]. These findings are unsurprising, given that these stereotypes likely impact Black people more strongly than non-Black people.

Black participants also indicate a marginally stronger stereotype that tall and white is competent, b = 0.50, $F(1, 947)$ = 3.27, P = 0.071, 95% CI [−0.04, 1.04], such that, compared with non-Black participants, they specifically perceived that tall White men are stereotyped as more competent, b = 0.70, $F(1, 715)$ = 12.62, $P < 0.001$, 95% CI [0.31, 1.08]. No gender effects emerged.

Discussion. The pilot provides evidence that cultural stereotypes of threat are increased by tallness more for Black targets than for White targets and, conversely, that cultural stereotypes of competence are increased by tallness more for White targets than for Black targets.

Pilot method. Qualtrics Panels recruited a representative sample of 318 participants (72% women, M_{age} = 47 y). These participants reflected the US population with respect to both race (70% White, 14% Black, 7% Hispanic, 4% Asian and Pacific Islander, 5% other) and annual income.

Participants completed a 2 × 2 (Target Race: Black, White byTarget Height: Tall, Short) within-subjects study. With n = 318 at level 2 and n = 4 at level 1, we had over 80% power to detect a medium-sized effect (2).

Materials and procedure.

Stereotype assessment. Participants indicated their knowledge of cultural stereotypes about four different groups—tall Black men, tall White men, short Black men, and short White men—by rating how strongly 13 different adjectives were "part of the cultural stereotype" about the group. Consistent with past work (1), we explicitly told participants to keep in mind that "these characteristics may or may not reflect your own personal beliefs" to clarify the purpose of the questions and reduce concerns about social desirability.

Adjectives. Participants rated 13 adjectives on a six-point scale (1 = not at all part of the stereotype; 6 = a very strong part of the stereotype), most of which reflected either potential competence (competent, skilled, intelligent, knowledgeable, adept) or potential threat (threatening, dangerous, forceful, and aggressive). We chose these items using a combination of factor analysis and face validity. A confirmatory factor analysis using Varimax rotation showed that the adjectives loaded onto two factors of competence (eigenvalue = 6.20) and threat (eigenvalue = 3.46). (Although traditional factor analysis with multilevel data can provide biased estimates, our results were sufficiently clear that even highly biased estimates would produce the same basic results.) "Athletic" loaded onto both factors; for this reason, we excluded this item from the threat items. Both subscales showed internal consistency, all Cronbach's $\alpha > 0.89$.

Previous Iteration of Study 2

Race, Height, and Racial Stereotypes. To test whether those higher in BaBT would judge tall Black men as especially threatening, we fit a three-way multilevel model predicting threat with race, height, and BaBT. This analysis yielded an expected two-way interaction between target race and BaBT, b = 0.14, $F(1, 133)$ = 8.84, P = 0.004, 95% CI [0.06, 0.22], such that those higher in BaBT rated Black men as more threatening relative to

White men. For our three-way analysis, we omitted five observations (out of 960) with a standardized residual of over three. Importantly, this analysis also yielded the key three-way interaction, $b = 0.15$, $F(1, 508) = 4.06$, $P = 0.045$, 95% CI [0.00, 0.31]. Because omitting outliers can either suppress or amplify effects, especially complex interactions, we conducted sensivity analyses by further omitting the outer 1%, 2%, and 3% of datapoints. These sensitivity analyses yielded P values of 0.036, 0.011, and 0.009, respectively, suggesting that the outliers in this dataset are generally suppressing the observed interaction.

For Black targets, the two-way interaction between height and BaBT was significant, $b = 0.16$, $t(220) = 2.61$, $P = 0.010$, 95% CI [0.04, 0.28]; however, for White targets, this two-way interaction was not significant, $b = 0.004$, $t(219) = 0.06$, $P = 0.95$, 95% CI [−0.12, 0.12]. These results suggest that the predictive utility of BaBT is moderated by height for relevant targets (Black men) but not for irrelevant targets (White men).

Although BaBT targets threat stereotypes, not competence stereotypes, we nevertheless tested whether a three-way interaction would emerge for competence ratings. We found an expected two-way interaction between target race and BaBT, $b = 0.11$, $F(1, 132) = 6.04$, $P = 0.015$, 95% CI [0.02, 0.20], such that those higher in BaBT rated White men as more competent than Black men. We did not find a three-way interaction, $b = 0.10$, $F(1, 558) = 1.39$, $P = 0.24$, 95% CI [−0.06, 0.26].

Suppressed Height Effects. For White targets, we found a negative indirect effect of height on threat, $ab = -0.06$, $z = -2.77$, $P < 0.01$; being taller makes you seem more competent and thus less threatening. Conversely, for Black targets, we found a negative indirect effect of height on competence, $ab = -0.06$, $z = -2.42$, $P < 0.05$; being taller makes you more threatening and thus less competent.

Method. The method for this study is nearly identical to that of study 2; the only difference is the makeup of the BaBT. We used these questions because they are less confounded with political beliefs than other scales (3) and because they more directly target stereotypes of Black violence. Participants provided their attitudes toward Black, Hispanic, and White people on seven-point bipolar scales for "nonviolent/violent," "nonthreatening/threatening," and "nonaggressive/aggressive." They also indicated how they would feel about (*i*) a relative marrying a Black, Hispanic, or White person and (*ii*) living in a neighborhood that is half populated by Black, Hispanic, or White families, using a five-point scale from "Very in favor" to "Very opposed."

We created an index variable representing participants' BaBT by weighting all items equally and then subtracting participants' attitudes about White targets from their attitudes about Black targets. This approach captured the relative difference in participants' attitudes (believing Blacks are more violent than Whites) rather than their overall attitudes (believing people are generally violent regardless of race). Finally, we averaged the five items to form an index of racist beliefs. A factor analysis with Varimax rotation confirmed that the five items capture a single factor ($\text{eigenvalue}_1 = 3.19$, $\text{eigenvalue}_2 = 0.93$). The scale showed good internal consistency, Cronbach's $\alpha = 0.85$.

To check whether our manipulation of height actually worked, we predicted the estimated height of each target by target perspective. The analysis revealed a main effect of target perspective on estimated height, $b = 2.73$, $F(1, 140) = 129.64$, $P < 0.001$, 95% CI [2.26, 3.20], such that targets that were looking down were perceived as taller ($M = 71.3$ in) than targets that were looking up ($M = 68.6$ in). We found no main effect of race, $b = -0.24$, $F(1, 140) = 0.98$, $P = 0.32$, 95% CI [−0.71, 0.24], although we did find a race by perspective interaction, $b = 0.80$, $F(1, 494) = 4.04$, $P = 0.045$, 95% CI [0.02, 1.58], such that perspective had a larger effect for Black photographs. Simple main effects show that Black looking-up photographs were perceived as 1.3 in. shorter than White looking-up photographs, $b = -0.64$, $t(222) = 2.05$, $P = 0.042$, 95% CI [−1.25, 0.02]. The difference between Black and White looking-down photographs was not significant, $b = 0.16$, $t(222) = 0.52$, $P = 0.61$, 95% CI [−0.45, 0.78].

Additional Analyses for Study 2

BaBT negatively predicted threat for both short White targets, $b = -0.15$, $t(338) = -0.08$, $P = 0.047$, 95% CI [−0.16, −0.00], and tall White targets, $b = -0.11$, $t(338) = -2.65$, $P = 0.008$, 95% CI [−0.19, −0.03]. BaBT did not predict threat for short Black targets, $b = 0.03$, $t(338) = 0.79$, $P = 0.43$, 95% CI [−0.05, 0.11]; however, it did positively predict threat for tall Black targets, $b = 0.15$, $t(338) = 3.71$, $P < 0.001$, 95% CI [0.07, 0.24].

For White targets, the two-way interaction between height and BaBT predicting competence was significant, $b = 0.09$, $t(791) = 2.82$, $P = 0.005$, 95% CI [0.03, 0.15]; however, for Black targets, this two-way interaction was not significant, $b = -0.03$, $t(790) = -0.81$, $P = 0.42$, 95% CI [−0.09, 0.04].

BaBT negatively predicted competence for both short Black targets, $b = -0.11$, $t(333) = -2.78$, $P = 0.006$, 95% CI [−0.19, −0.03], and tall Black targets, $b = -0.14$, $t(333) = -3.41$, $P = 0.001$, 95% CI [−0.22, −0.06]. BaBT did not predict competence for short White targets, $b = -0.01$, $t(333) = -0.33$, $P = 0.74$, 95% CI [−0.09, 0.07]; however, it did marginally positively predict competence for tall White targets, $b = 0.08$, $t(333) = 1.87$, $P < 0.001$, 95% CI [−0.00, 0.16].

Textual Descriptions of Height Used in Study 3

All descriptions began with "Imagine meeting this man . . . ." Then, participants randomly saw one of the following descriptions alongside a photograph of a Black or White man. Descriptions were randomly sampled without replacement. The set of descriptions participants read depended on whether they were assigned to counterbalance 1 or counterbalance 2.

Counterbalance 1:

As you approach each other, you can see that he is quite tall.

As you approach each other, you can see that he is very short.

As you move toward each other, he looks down at you; he's very tall.

As you move toward each other, he looks up at you; he's quite short.

As you walk toward each other, you notice that he is a lot taller than you.

As you walk toward each other, you notice that he is much shorter than you.

As you near each other, you realize that he is much taller than you.

As you near each other, you realize that he is a lot shorter than you.

Counterbalance 2:

As you approach each other, you can see that he is very tall.

As you approach each other, you can see that he is quite short.

As you move toward each other, he looks down at you; he's quite tall.

As you move toward each other, he looks up at you; he's very short.

As you walk toward each other, you notice that he is much taller than you.

As you walk toward each other, you notice that he is a lot shorter than you.

As you near each other, you realize that he is a lot taller than you.

As you near each other, you realize that he is much shorter than you.

Additional Analyses for Study 3

For Black targets, the two-way interaction between height and BaBT predicting threat was significant, $b = 0.12$, $t(877) = 3.26$, $P = 0.001$, 95% CI [0.05, 0.20]; however, for White targets, this two-way interaction was not significant, $b = -0.04$, $t(877) = -1.07$, $P = 0.28$, 95% CI [−0.12, 0.03]. BaBT did not predict threat for short White targets, $b = 0.01$, $t(500) = 0.15$, $P = 0.88$, 95% CI [−0.06, 0.07], or tall White targets, $b = -0.04$, $t(522) = -2.65$, $P = 0.008$, 95% CI [−0.19, −0.03]. BaBT did marginally positively predicted threat for short Black targets, $b = 0.07$, $t(522) = 1.93$, $P = 0.054$, 95% CI [−0.00, 0.14]; however, it did positively predict threat for tall Black targets, $b = 0.19$, $t(522) = 5.40$, $P < 0.001$, 95% CI [0.12, 0.26].

For White targets, the two-way interaction between height and BaBT predicting competence was significant, $b = 0.09$, $t(768) = 2.34$, $P = 0.020$, 95% CI [0.01, 0.16]; however, for Black targets, this two-way interaction was not significant, $b = -0.02$, $t(768) = -0.43$, $P = 0.67$, 95% CI [−0.09, 0.06]. BaBT negatively predicted competence for both short Black targets, $b = -0.11$, $t(450) = -2.83$, $P = 0.005$, 95% CI [−0.18, −0.03], and tall Black targets, $b = -0.12$, $t(433) = -3.29$, $P = 0.001$, 95% CI [−0.20, −0.05]. BaBT did not predict competence for short White targets, $b = -0.04$, $t(433) = -1.79$, $P = 0.27$, 95% CI [−0.11, 0.03] or for tall White targets, $b = 0.04$, $t(450) = 1.17$, $P = 0.24$, 95% CI [−0.03, 0.12]. Note that the height effects for White targets are in opposite directions, as indicated by the interaction.

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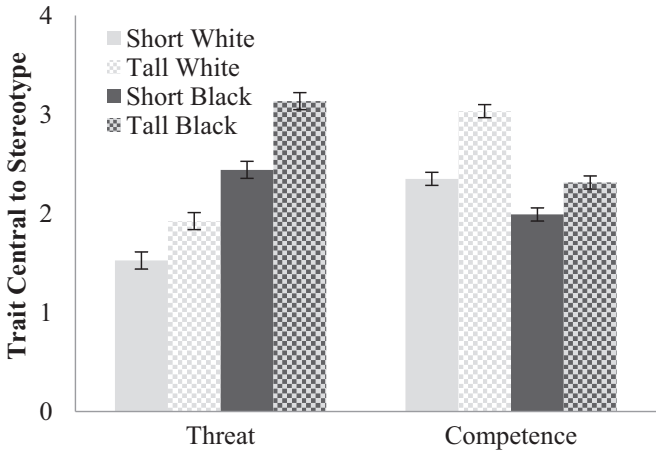

Fig. S1. Ratings of the centrality of competence traits (e.g., intelligent, adept) and threat traits (e.g., aggressive, violent) for cultural stereotypes of short and tall White and Black men. Bars depict SEs.

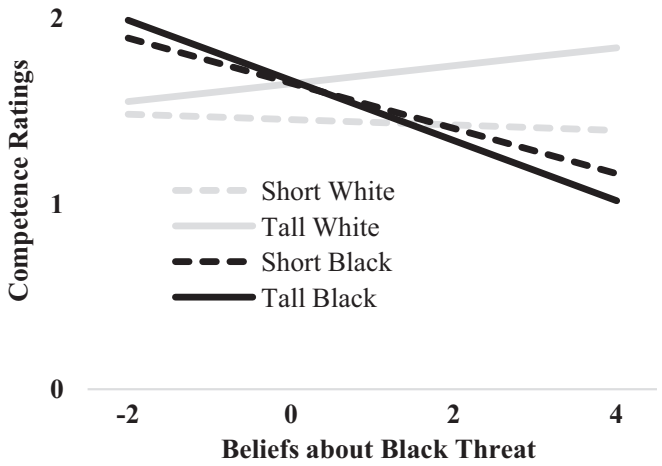

Fig. S2. Study 2 ratings of competence by race, height, and BaBT. Positive values indicate beliefs that Black people are more threatening than White people; negative values indicate beliefs that White people are more threatening than Black people.

Table S1. Findings and targets used in previous research on height and person perception

Authors	Year	Taller men are . . .	Male targets used
Mazur et al. (1)	1984	More likely to gain promotions	99.4% White cadets
Shepperd and Strathman (2)	1989	Preferred for dates	One White student
Jackson and Ervin (3)	1992	Rated as more athletic, masculine	Target's name was "John"; participants were 85% White
Hensley (4)	1994	Rated as more attractive	Student's from a mid-Atlantic university (mostly White)
McCann (5)	2001	More likely to win in presidential elections when high societal threat is present	White candidates
Judge and Cable (6)	2004	Higher in self-esteem, earned income when working	Three US samples and one British sample of workers (mostly White)
Cinnirella and Winter (7)	2009	Given higher salaries	European workers (mostly White)
Gawley et al. (8)	2009	Given higher authority status	Workers in Canada (mostly White)
Cinnirella et al. (9)	2011	Given better teacher recommendations, are more likely to attend high school	German students (mostly White)
Stulp et al. (10)	2012	Given higher status as referees, perceived as more competent	Referees in top French soccer league (mostly White)
Blaker et al. (11)	2013	Seen as better leaders, healthier, more dominant, and more intelligent	White targets
Re et al. (12)	2013	See as more masculine, better leaders	White targets (faces only)
Stulp et al. (13)	2013	Given more of the popular vote as presidential candidates, are more likely to be reelected	White candidates
Agerström and Carlsson (14)	2014	Perceived as more competent and healthier as presidential candidates	White job candidate
Batres et al. (15)	2015	More masculine and thus more dominant	White targets (faces only)

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Table S2. Coefficient tables for study 1

Model term	Standardized coefficient	Standardized SE	t-value	*P* value	95% CI, lower bound	95% CI, upper bound
Photo IDs only, n = 1,073,536, standardized results						
Intercept	1.650	0.202	8.17	0.000	1.254	2.046
Height, in.	0.072	0.003	21.15	0.000	0.066	0.079
Precinct felony rates	0.483	0.211	2.29	0.022	0.070	0.897
High-crime area (yes or no)	0.072	0.003	23.28	0.000	0.066	0.078
Weight, lbs	0.041	0.004	11.80	0.000	0.035	0.048
Age, y	−0.104	0.003	−32.38	0.000	−0.110	−0.097
Height by precinct felony rates interaction	−0.010	0.003	−3.18	0.001	−0.017	−0.004
Height by high-crime area interaction	0.007	0.003	2.25	0.025	0.001	0.013
Height by weight interaction	0.047	0.003	15.71	0.000	0.041	0.053
Height by age interaction	0.031	0.003	9.669	0.000	0.025	0.037
Photo and verbal IDs, n = 1,915,114, standardized results						
Intercept	1.838	0.208	8.79	0.000	1.423	2.239
Height, in.	0.086	0.003	30.70	0.000	0.080	0.091
Precinct felony rates	0.496	0.218	2.28	0.023	0.069	0.923
High-crime area (yes or no)	0.064	0.002	25.53	0.000	0.059	0.069
Weight, lbs	0.018	0.003	6.29	0.000	0.012	0.023
Age, y	−0.164	0.003	−64.61	0.000	−0.169	−0.159
Height by precinct felony rates interaction	−0.011	0.003	−4.18	0.000	−0.016	−0.006
Height by high-crime area interaction	0.009	0.002	3.66	0.000	0.004	0.014
Height by weight interaction	0.043	0.002	18.29	0.000	0.039	0.048
Height by age interaction	0.032	0.003	12.55	0.000	0.027	0.037

To standardize binary logistic regression coefficients in a multilevel framework, we standardized all predictors before centering (precinct felony rates, high-crime area) and group mean centering (height, weight, age) and used these values in our model. This standardization allows interpretation and comparison of effect sizes.

Other Supporting Information Files

Dataset S1 (CSV)
Dataset S2 (CSV)
Dataset S3 (CSV)