



White Americans' preference for Black people in advertising has increased in the past 66 years: A meta-analysis

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This study investigates Black and White consumers' preferences for Black versus White people in United States advertising contexts over 66 y, from 1956 until 2022, a time in which the United States has experienced significant ethno-racial diversification. Examining Black and White consumers' reactions to visual advertising over more than half a century offers a unique and dynamic view of interracial preferences. Mass advertising reaches an audience of billions and can shape people's attitudes and behavior, emphasizing the relevance of clarifying the influence of race in advertising, how it has evolved over time, and how it may contribute to mitigating discrimination based on racial perceptions. A meta-analysis of extant experiments into the relationship between the depicted endorser's race (i.e., the model in a visual ad) and the reaction of Black and White viewers pertains to 332 effect sizes from 62 studies reported in 52 scientific papers, comprising 10,186 Black and White participants. Our results are anchored in a conceptual framework, including a comprehensive set of perceiver (viewer), target (endorser), social/societal context, and publication characteristics. Without accounting for temporal dynamics, the results indicate ingroup favoritism, such that White viewers prefer White models and Black viewers prefer Black models. But by controlling for the publication year, it is possible to observe a time-dependent trend: Historically, White consumers preferred endorsers of the same race, but this preference has significantly shifted toward Black endorsers in recent years. In contrast, the level of Black consumers' reactions to endorsers of the same race remains largely unchanged over time.

diversity | advertising | meta-analysis | race | racial inequality

The political landscape in the United States has changed notably since the modern Civil Rights Movement of the 1960s. In particular, social and legal reforms have reduced the formal barriers that historically limited African Americans' access to various resources (1, 2). Large companies and institutions also explicitly recognize diversity as an important goal, offer support for social and political movements like Black Lives Matter (BLM) (3), and publicize their efforts to discontinue racially insensitive policies (4), while also introducing more racially inclusive products (5). In advertising campaigns like Nike's "Crazy Dreams," featuring Colin Kaepernick, companies leverage communication about racial discrimination and equal rights as a fundamental means to connect with consumers as well as to succeed commercially. This particular campaign earned Nike around \$6 billion in brand value and an all-time high stock price (6).

Despite such signals of change, the very existence of the BLM movement—one of the most expansive social movements in recent U.S. history—also highlights the ongoing racial discrimination and challenges to fundamental rights that African American citizens face (7). Ample academic research demonstrates that social inequality and racial discrimination persist in various contexts, including hiring (8), housing (9), health (10), education (11), childcare (12), wealth accumulation (13), and everyday interactions (14). The COVID-19 pandemic made the stark differences in life expectancy between Black and White Americans more evident, reflecting persistent inequalities in insurance systems (15). Even as some research implies the decreased prevalence of explicit anti-Black prejudice (16), stereotypes and implicit bias persist widely (17–19).

Advertising in mass media, which reaches an audience of billions, has the potential to change people's behavior (20) and even reduce discrimination and prejudice (21, 22). Anecdotal evidence also indicates the effectiveness of advertising related to diversity, equity, and inclusion themes (6). Yet many firms, whose marketing departments remain dominated by White people (23), appear hesitant to increase the share of Black endorsers (24). How Black and White consumers react to endorsers of their own or a different race and how stable these interracial preferences are over a long time span remain two important open questions.

Significance

In pursuit of the societal benefits of racial diversity, various theoretical approaches, such as social identity theory, cite ingroup favoritism as a barrier. However, substantial research questions the existence of intergroup bias. The present meta-analysis establishes a direct measure of advertising models' race on outcome variables, providing a unique lens on the dynamics of interracial preferences to resolve empirical contradictions. The results indicate no significant change in ingroup preferences among Black respondents. In contrast, White respondents express increasing preferences for Black endorsers over White endorsers in advertising over time. These findings are in line with the changing demographic structure in the United States and signal the need for further developments of the underlying theoretical processes and their implications for society.

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A frequently applied theoretical lens in extant research into intergroup behavior refers to the idea of ingroup favoritism (25), which is derived from social identity theory, as introduced by Tajfel and Turner (26). In relation to race, this theory posits that people compare their racial ingroup with some racial outgroup, in ways that favor the former. In line with this theory of ingroup favoritism, several studies assert that Black people tend to prefer Black endorsers, (e.g., ref. 27), and White people tend to prefer White endorsers, (e.g., ref. 28).

In contrast, other evidence indicates interracial outgroup preferences, such that Black people prefer White over Black endorsers, (e.g., ref. 29), and White people favor Black over White endorsers, (e.g., ref. 30). To explain Black people's positive responses to White endorsers, some studies draw on system justification theory (31) and the idea of social hostility, which implies that internalized group self-hatred can occur within discriminated groups (32). To explain White people's positive responses to Black endorsers, a few studies cite the concept of "White guilt" and attempts to appropriate Black culture (33). More generally though, the persistent discrepancy in empirical findings and contradicting theoretical predictions motivate our systematic analysis of interracial preferences between Black and White consumers, who together account for more than 70% of the current U.S. population (34).

What's more, the racial composition of the United States is not static, highlighting the need for a dynamic perspective on interracial preferences. Even the concept of race itself can be considered as "dynamic, malleable, and socially constructed, shifting across time, place, perceiver, and target" (35, p.439). Specifically, the share of nonmixed White Americans has significantly decreased over time, while interracial, minority-White marriages have significantly increased (36). The increasingly mixed demographic is not appropriately reflected in the U.S. Census data (37), which forecasts a majority-minority shift by mid-century. This speculated inflection point, at which the current ethno-racial minorities are expected to outnumber the White majority population in the United States (38), has been populated by mass media, (e.g., ref. 39), profoundly shaping the American demographic narrative of the twenty-first century and fanning fears among White Americans (37). What are the ramifications of these demographic dynamics on White Americans' preference for Black people in advertising?

The main outcome measure of the present meta-analysis is operationalized as the difference in preferences for Black versus White endorsers (as captured by Cohen's d ; see *Materials and Methods*). This operationalization reflects the decomposition of intergroup relationships into an ingroup and an outgroup component, as commonly done in social sciences, (e.g., ref. 33). This distinction is important as ingroup attitudes do not need to be inversely related to outgroup attitudes (40). Accordingly, changes in White Americans' relative preference for Black versus White endorsers over time can be shaped by (at least) two concurrent social-psychological forces. While interracial preferences over time are a complex function of a host of institutional, cultural, and economic factors such as "generational replacement, repercussions of policy shifts or economic conditions, interpersonal and organizational tensions, or the building of mass consensus and movements" (41, p.4), in addition to testing the effects for differences in preferences for Black versus White endorsers, to gain a better understanding of the underlying processes, we explore possible moderating factors by drawing on the two most frequently studied individual-level moderators in our sample of interracial advertising studies. First, White

Americans' preference for Black endorsers could increase over time due to lowered anti-Black prejudice levels toward their outgroup, (e.g., ref. 42). Second, White Americans' preference for White endorsers could reduce due to lower ethnic identification with their own ingroup, (e.g., ref. 43). Reductions in both these factors, i.e., lower anti-Black racial prejudice and lower ethnic identification among White Americans, which are considered independent forces (44), would contribute to a higher relative preference for Black versus White endorsers.

Indeed, ample evidence suggests that legal and institutional changes as well as landmark events in the past seven decades, e.g., the Civil Rights Movement in the 1960s, including the Civil Rights Act of 1964, the Voting Rights Act of 1965, and the Fair Housing Act of 1968, and the contemporary BLM movement, coupled with the increasing ethno-racial diversification of the U.S. population, have contributed to reduced interracial prejudice and increased racial tolerance in the White U.S. population (16, 45–47), which could contribute to White Americans' increased preferences for Black people.

Regarding the temporal dynamics of White identity, the literature is less conclusive, especially as the ethnic identification of White Americans as the dominant group and racial default has remained largely "hidden" (48). On the one hand, in recent history, the presidential elections of Barack Obama in 2008 and of Donald Trump in 2016 have purportedly contributed to an increase in White Americans' group consciousness (49). Many White Americans even feel that their racial group is subject to anti-White discrimination, which could strengthen their group identity (50). On the other hand, since the large-scale assimilation in the post-World War II period, White ingroup heterogeneity has substantially increased, diversifying the White American mainstream (36, 51). Especially for high-status individuals, lower ingroup homogeneity is associated with lower ingroup identification (52). Furthermore, intermarriage has blurred the "persistent Black/White color line" (53), with some mixed-raced Americans even perceiving "whiteness as stigma" (54).

Despite these developments, which might lead to more favorable evaluations of Black versus White endorsers by White Americans, theoretical work posits that White Americans can experience the growing share of the non-White population as a threat, which is purported to translate into higher prejudice toward the threatening outgroup (55, 56). Being exposed to information about the racial demographic shift can foster political conservatism (57), weaken diversity endorsement (58), activate White identity in American politics (59), trigger anxiety and concerns about anti-White discrimination among White Americans (60, 61), and evoke racial bias (62). Poor economic conditions (63), which in turn can promote beliefs of the economy as a zero-sum system (64), can amplify status threats (65, 66). Furthermore, the "monolithic non-White group" that the majority-minority narrative implies can exacerbate perceived status threats among the White U.S. population (61), stimulate anxiety, and impact their political attitudes (67). Collectively, these studies suggest exposure to a rising outgroup population might undermine White Americans' preference for Black people, foster prejudicial attitudes, and yield interracial hostility (35, 61).

However, seemingly paradoxically, exposure to outgroup members through interracial interactions can also enhance preferences and lower prejudicial attitudes, as evidenced by ample literature in the context of contact theory (68). The contact-prejudice relationship is stronger for majority-status groups (69). While it is plausible to predict that perceived status threats might at least dampen White Americans' preference for Black

endorsers in advertising, overall reduced prejudice levels in the U.S. population since the 1950s (16) and exposure to increased levels of racial inclusion in the advertising industry (70) might counteract these effects. In addition, status threats arising from racial progress are attenuated for individuals who perceive the U.S. status hierarchy as illegitimate (71), are more educated (72), and who identify less with their race (73). For White people with low ethnic identification, status threat can even be muted (74). Lastly, the exposure to outgroup members in low-stakes contexts such as advertising, which are less likely to be perceived as zero-sum situations, might elicit lower status threats compared to high-stakes contexts such as employment and welfare (66, 75).

Taken together, we probe the possibility of a positive time trend of White Americans' relative preference for Black (versus White) endorsers, arguing that the outgroup preference is higher for White viewers with low anti-Black prejudice and low ethnic identification levels. However, we know of no research that analyzes interracial group preferences or processes that drive consumers' identification with endorsers who represent a racial ingroup versus outgroup over a multi-decade time span. In related discrimination research, most studies take a static approach, (e.g., refs. 14 and 33); among the few studies that analyze discrimination dynamically, most rely on time windows spanning a few months or years, (e.g., refs. 7, 17, and 46). In a notable exception, Quillian and Lee (19) investigate a 48-y period in an effort to analyze the evolution of hiring discrimination. In a similar spirit, we gather data across nearly two thirds of a century (i.e., from 1956 to 2022) and thereby strive to offer insights into the evolution of interracial preferences in relation to advertising. In detail, with a meta-analysis that includes 332 effect sizes and 10,186 participants from 52 papers, we seek to resolve empirical inconsistencies related to how endorsers' race is perceived by viewers of different races. In so doing, we contribute to the body of literature addressing racial preference formation by adding an explicitly dynamic component.

This approach uncovers several critical insights. First, we find evidence of ingroup favoritism. Historically, on average, Black and White viewers preferred endorsers of their own race. Consistent with distinctiveness theory (76), the absolute ingroup preference is higher among Black viewers than White viewers, implying that Black viewers had a stronger preference for Black endorsers than White viewers had for White endorsers. Second, we find that these perceptions are not stable over time. Specifically, in the past 66 y, the preferences of White viewers for Black endorsers have increased significantly, though we find no significant change in the preferences expressed by Black viewers. These findings are robust to various controls and several sensitivity analyses. Third, if we filter the sample to include only identification-related outcome measures (e.g., "How likely are you to identify with the depicted endorser?"), the effects become more pronounced, suggesting that changes in preferences can be traced to the endorsers. Lastly, we provide evidence for two social-psychological moderators that may explain the preference dynamics that we identify. Specifically, we show that White Americans with lower prejudice levels toward Black people and lower ethnic identification with their own ingroup express a stronger relative preference for Black (versus White) endorsers in advertising.

Overall, our work contributes to the broad literature pertaining to racial preferences. Advertising can be powerful in shaping people's beliefs, behavior, and attitudes. Depicting racially and ethnically diverse endorser settings in advertisements can help to reduce discrimination and enhance equality. Thus, our

meta-analysis provides clear evidence to continue diversifying advertising and including Black endorsers, as Black and White Americans feel mutually addressed.

For our analysis, we undertake three main efforts. First, we examine all relevant published studies that contain statistical information about evaluations of Black and White endorsers. We concentrate on studies that include Black, White, or Black and White separate samples. Second, we code important characteristics of the studies, including relevant meta-analytical variables. For our meta-analysis, we developed a conceptual framework with a comprehensive set of covariates, structured along perceiver (viewer) characteristics, target (endorser) characteristics, social/societal context, and publication characteristics. The conceptual framework is grounded in the available empirical evidence and work on contemporary racial dynamics (35), see Fig. 1. Third, we perform a random-effects meta-regression. To determine the evaluation of each stimulus, we calculate Cohen's *d*, which offers a suitable effect size measure for experimental studies (77); we provide further details about the sample and coding in the *Methods and Materials*. This meta-analysis conforms to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA, 78), as detailed in *SI Appendix, Fig. S1*.

Results

Model-Free Evidence. We gather model-free evidence from the 332 coded effect sizes, obtained from 10,186 Black and White participants. A positive effect size indicates a higher mean rating of the Black-endorser ad in comparison to the White-endorser ad by viewers, with regard to the coded outcome measures. Therefore, a higher mean rating of the White endorser would be indicated by a negative value of the effect size, whereas a positive effect size reflects a preference for the Black over the White endorser (for details of the computation of Cohen's *d* see the *Materials and Methods*). On average per study, Black viewers are characterized by an effect size of 0.5018 [95% CI (0.3697, 0.6340)], which offers evidence of a moderate ingroup preference (79), i.e., Black respondents prefer Black endorsers. In contrast, the effect size for White viewers is -0.0801 [95% CI (-0.2069 , 0.0467)], suggesting a directional but insignificant preference for White endorsers (*SI Appendix, Figs. S2 and S3*).

Next, we split the data at the median of the studies' publication years (i.e., 2000). Fig. 2 depicts the graphical distinction between the mean effect size of either Black or White viewers before and after the turn of the millennium offering preliminary evidence of temporal dynamics in interracial preferences. Specifically, this data split indicates that the Black viewers' mean effect size stays positive before and after 2000, equal to 0.6330 [SE = 0.0862, CI (0.5468, 0.7192)] before 2000 and 0.5540 [SE = 0.0531, CI (0.5009, 0.6071)] after 2000. In contrast, White viewers display an average effect size of -0.161 [SE = 0.0715, CI (-0.2325 , -0.0895)] before 2000, indicating an ingroup preference for White models. However, after 2000, the effect size turns positive [$d = 0.0247$, SE = 0.0729, CI (-0.0482 , 0.0976)], which constitutes preliminary, directional evidence that White viewers rate Black endorsers better than endorsers of their own race. Without taking the multi-level structure of the data into account, this analysis implies a preference shift among White viewers, from White toward Black endorsers.

Meta-Regressions. To explore the precise trends over time, we estimate a set of meta-regressions. Specifically, to capture sources of variance, we include a random effect at the study level,

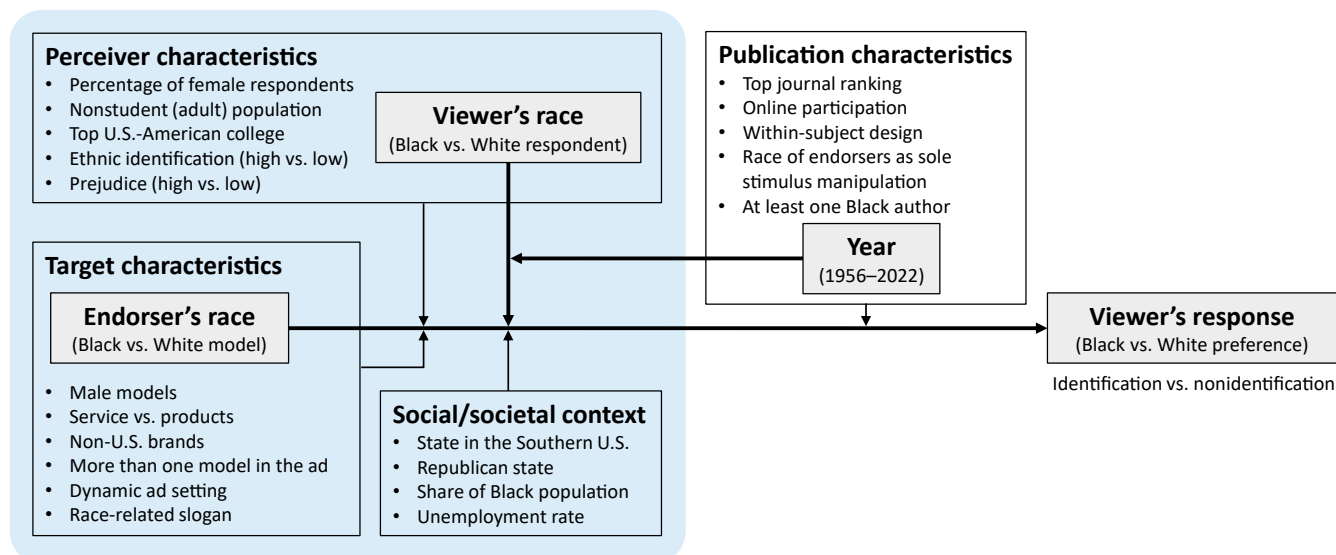


Fig. 1. The conceptual framework is based on Richeson and Sommers (35), categorizing the meta-analytical moderators into perceiver (viewer) characteristics, target (endorser) characteristics, the social/societal context, and publication characteristics. The blue box indicates the three conceptual categories introduced in the original framework on contemporary racial dynamics. Bold arrows indicate main relationships of interest, i.e., dynamic preference changes of Black versus White respondents for Black versus White models.

which captures variation in outcome measures across studies. We find sufficient heterogeneity ($Q\text{-test} = 2288.1388$, $P < 0.001$, $I^2 = 90.03\%$; *SI Appendix, Table S1*); adding viewers' race as a predictor reduces heterogeneity significantly ($I^2 = 86.40\%$), as well as the interaction with the publication year ($I^2 = 86.25\%$). The full-outcome model exhibits the most substantial reduction in heterogeneity ($I^2 = 86.13\%$). See *SI Appendix, Fig. S4* for tests for publication bias, which is an important concern related to meta-analyses (80).

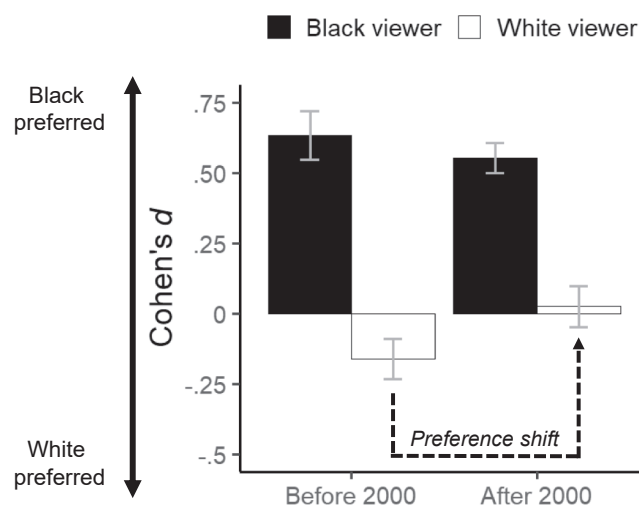


Fig. 2. This figure represents the average model-free effect sizes before and after the publication year 2000. The year 2000 represents the median split of the data (Before 2000: 57 effect sizes by Black versus 76 effect sizes by White respondents; After 2000: 112 effect sizes by Black versus 87 effect sizes by White respondents). Black bars represent the mean effect size by Black viewers, and white bars represent the mean effect size by White viewers. If these bars extend above zero, it implies a tendency to prefer the Black over the White endorser. The error bars indicate SE of the mean based on model-free effect sizes.

Taking the multi-level structure of the data into account, we regress the effect sizes on the continuous publication year in Model 1 in Table 1, which yields consistent results to the binary temporal split in the model-free evidence in Fig. 2. Overall, we find that Black viewers tend to rate Black endorsers better than White endorsers [$\beta = 0.5718$, CI (0.4526, 0.6909), $P < 0.001$] and that White viewers directionally prefer White over Black endorsers [$\beta = -0.0488$, CI (-0.1635, 0.0659)], although this effect is statistically insignificant ($P = 0.4044$). More importantly, while we observe no significant time trend for Black viewers [$\beta = -0.0069$, CI (-0.0164, 0.0025), $P = 0.1517$], White viewers exhibit a positive interaction effect with the publication year, which suggests an increasing preference for Black (versus White) endorsers over time [$\beta = 0.0123$, CI (0.0031, 0.0216), $P < 0.01$].

The effects, reported in Model 1, remain robust with all added covariates in Model 2. Specifically, we observe a statistically significant interaction term of viewers' race and the publication year [$\beta = 0.0128$, CI (0.0028, 0.0229), $P < 0.05$]. In contrast, for Black viewers, preferences for Black endorsers remain approximately flat [$\beta = -0.0055$, CI (-0.0175, 0.0064), $P = 0.3660$]. Across the entire time span of 66 y, among White viewers, the effect size increases from -0.3422 to 0.1420 , reflecting their increasing preference for Black endorsers over time. For Black viewers, the overall effect size over time remains generally stable and constantly larger than zero, confirming the strong, time-consistent ingroup preference we identified in Model 1 ($d = 0.8538$ in 1956, $d = 0.4902$ in 2022).

SI Appendix, Table S2 provides detailed descriptions of all covariates. For example, we include a binary variable At least one Black author to determine if the author team included any Black members in comparison to only White or other ethno-racial groups. The lack of effect suggests the results are independent of the racial composition of the author team. See *SI Appendix, Table S3* for details of the distributions and summary statistics for all covariates. Our dataset is nearly balanced in terms of Black (169 effect sizes) versus White respondents (163 effect sizes).

Table 1. Random-effects meta-regressions of Cohen's d

Moderators	Model 1: No controls	Model 2: Full-outcome model	Model 3: Identification model
Intercept	0.5718*** (0.0608)	0.6114** (0.2367)	0.8160* (0.3317)
Main variables			
White viewer	−0.6206*** (0.0674)	−0.6308*** (0.0728)	−0.7429*** (0.1060)
Year of publication	−0.0069 (0.0048)	−0.0055 (0.0061)	−0.0066 (0.0094)
White viewer × Year of publication	0.0123** (0.0047)	0.0128* (0.0051)	0.0187* (0.0091)
Publication characteristics			
Top journal ranking		−0.2517 (0.1819)	−0.5392* (0.2722)
Online participation		−0.3112* (0.1553)	−0.4797* (0.2109)
Within-subject design		−0.0693 (0.1529)	0.0374 (0.1991)
Race of endorsers as sole stimulus manipulation		0.1179 (0.1228)	0.0859 (0.1575)
At least one Black author		0.0945 (0.1173)	0.1607 (0.1639)
Nonidentification-related DVs		−0.0135 (0.0666)	
Perceiver characteristics			
Percentage of female respondents		−0.0047 (0.0026)	−0.0079* (0.0033)
Nonstudent (adult) population		0.0025 (.1364)	0.1653 (.1925)
Top U.S.-American college		0.1146 (.1509)	0.3307 (.1923)
Target characteristics			
Male models		−0.0461 (0.1557)	−0.1147 (0.1889)
Service vs. products		0.0814 (.1370)	0.0584 (.1900)
Non-U.S. brands		0.0173 (.1627)	−0.1164 (.2328)
More than one model in the ad		0.0854 (.1389)	0.0540 (.1841)
Dynamic ad setting		−0.2244 (0.1818)	−0.4096 (0.2504)
Race-related ad slogan		−0.0199 (0.1795)	0.1220 (0.2389)
Social/societal context			
State in the Southern United States		−0.3022 (0.1715)	−0.3373 (0.2124)
Republican state		−0.0646 (0.1298)	−0.2216 (0.1788)
Share of Black population		0.0197* (0.0095)	0.0203 (0.0131)
Unemployment rate		−0.0443 (0.0479)	−0.0720 (0.0615)
N (effects) ^a	332	332	189

* $P < .05$; ** $P < .01$; *** $P < .001$.
Notes: Models 1 and 2 contain all effect sizes. Model 3 is based on a subset of the identification-related effect sizes. See [SI Appendix, Table S4](#) for sensitivity analyses.
N represents the total number of effect sizes included in the models. Standard errors are in parentheses. The time frame extends from 1956 to 2022 for all three models. Percentage of female study respondents, share of Black population, unemployment rate, and year of publication are mean-centered. All other predictor variables are dummy-coded.
^aNo effect size had a standardized residual value above 3 following Cohen et al. (77). 6 observations with Cook's distance values above 0.0118 have been excluded following the rule $4/n$ (81), where n refers to the overall number of effect sizes included in the analysis.

Identification Model. Identification has critical effects in the context of interracial preferences (35, 43). Both ingroup favoritism and social identity theory (82) build on interpersonal identification processes. Therefore, we reduce the full-outcome model (Model 2) to include only the dependent variables that capture the degree to which viewers identify with the endorsers

to probe the possibility that our main effect becomes more pronounced when we prioritize these focal variables (rather than general advertising outcomes, such as purchase intentions and ad liking). The outcome measures in Model 3 thus include, for example, identification with the endorser, attractiveness, perceived similarity, and the overall endorser rating. The covariates are identical to those in Model 2.

As predicted, for Model 3 in Table 1, we observe a higher effect size among White viewers. Specifically, the overall effect size for White viewers shifts from -0.4611 to 0.3402 in the time span from 1956 to 2022. This time interval is broader than that for Model 2, and it reveals a stronger interaction effect [$\beta = 0.0187$, CI (0.0008, 0.0367), $P < 0.05$].

To explore comparability of our outcome measures, we further split the identification-related outcome variables into i) endorser-related and ii) self-related variables. *SI Appendix, Table S4* presents the results. Similarly, we split the nonidentification-related variables, which pertain to traditional marketing outcomes (83), into iii) attitudinal and iv) behavioral outcomes. For all four submodels, we obtain consistent results to our main models in Table 1 in terms of the interracial preference dynamics, i.e., the interaction between viewer's race and the publication year, suggesting that the outcome measures are comparable and can be analyzed jointly.

Post-Estimation Analysis. Fig. 3 graphs the predictions based on the full-outcome model with all covariates (i.e., Model 2 in Table 1). It plots the effect sizes by year and by viewer's race (Black versus White), with a linear best fit and 95% CIs. We hold all variables at their reference level or mean for continuous variables.

For Black viewers, the slope of the black-hued line is close to zero ($\beta = -0.0055$, $P = 0.3660$). In contrast, for White viewers, the light gray line slopes upward, as indicated by the positive interaction effect between White viewer and publication year ($\beta = 0.0128$, $P = 0.0119$). These trend lines indicate a shift in interracial preferences.

According to the x-axis of the effect size at zero, we can identify the position of an indifferent rating between Black and White endorsers, and then the shift of White Americans' preference for

Black endorsers. We determine that this turning point, where White people start directionally preferring Black over White endorsers, occurs between 2002 and 2003, acknowledging that this turning point is contingent on the moderators' reference levels in Model 2.

While our empirical evidence suggests a rather gradual than an abrupt change in White Americans' interracial preference, there are several possible accounts to explain increasing White preferences for Black models around the turn of the millennium. First, the rise of the Internet facilitated social online interactions, interracial contact, and ethno-racial exposure, which can contribute to increasing White Americans' preference for Black models (21, 22). Second, the hip-hop music movement—a channel of Black cultural expression—entered the U.S. mainstream around the turn of the millennium, contributing to an assimilation of Black and White culture (84). Third, the turn of the millennium marked a generational shift in consumers. Post-millennial generations are considered the most demanding cohorts with respect to greater diversity in marketing ever seen in the United States (85).

Evidence on Social-Psychological Moderators. Drawing on extant theories pertaining to interracial attitudes, we posit that White Americans' increasing preference for Black endorsers over time is a function of at least two concurrent social-psychological forces: reduced anti-Black prejudice levels of White Americans and lower ethnic identification among the White population, which represent the most studied individual-level moderators in our sample. While we lack sufficient observations to explore these social-psychological moderators dynamically, we can test if individual differences in interracial prejudice levels and ethnic identification moderate the preference for Black versus White endorsers. For this purpose, we run two additional meta-regressions on a subset of all studies that explore these two participant-specific psychological moderators. Reductions in both (i.e., lower prejudice, lower ethnic identification) should increase White Americans' relative preference for Black people in advertising. In total, for ethnic identification (anti-Black prejudice) we observe 61 (21) effect sizes.

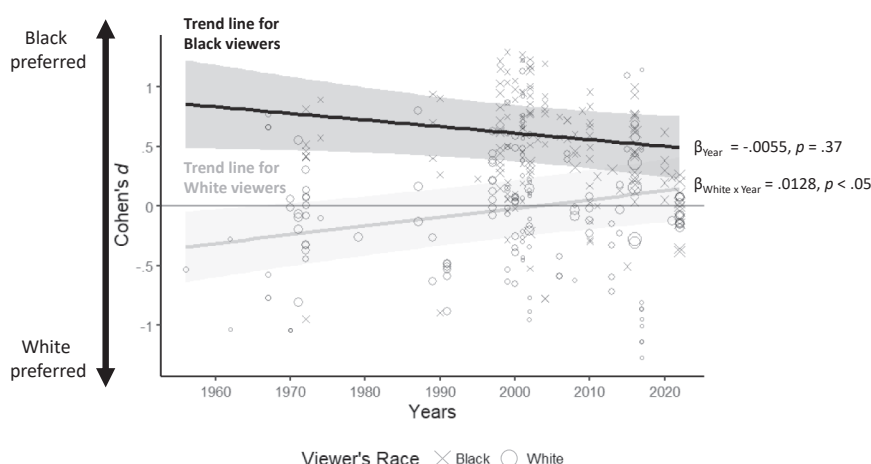


Fig. 3. Predicted effect sizes of the random-effects model over time (based on Model 2, Table 1). The x-axis represents the studies' publication years. The gray crosses and circles indicate individual effect sizes for Black and White viewers, respectively. For ease of interpretation, the plot shows effect sizes between -1.3 and 1.3 . The size of plotted crosses is proportional to the meta-regression weights. The solid black line captures predictions involving Black study participants, whereas the solid light gray line refers to predicted endorser evaluations by White study participants. The dark and light-shaded regions around the predicted regression lines indicate the 95% CI. No significant temporal change in favoring Black versus White endorsers occurs among Black viewers. The preference for Black endorsers increases among White viewers over time. Note that the given β -coefficients correspond to the regression coefficients reported in Table 1, Model 2 and should be added to interpret the effect size for White viewers over time.

First, we assess how the respondents' degree of ethnic identification, i.e., a person's knowledge of his or her social groups' membership and the value attached to that membership (86), affects their preference for Black relative to White endorsers. Consistent with the foregoing arguments, we find that White Americans with a low ethnic identification have a stronger preference for Black endorsers, as the moderating effect is positive and highly statistically significant [$\beta = 1.3187$, CI (0.6410, 1.9965), $P < 0.001$]. This effect also pertains to Black Americans who exhibit a higher preference for their ingroup for high levels of ethnic identification, see *SI Appendix, Table S5*.

Second, we assess how differences in White Americans' anti-Black prejudice levels affect interracial preferences. Note among the studies investigating the role of prejudice on the perception of Black versus White endorsers we identified only studies with White respondents. Differences in anti-Black prejudice in our studies were captured by different explicit prejudice scales such as Brigham's (87) Attitudes Toward Blacks Scale, including questions such as "I get very upset when I hear a White make a prejudicial remark about Blacks.". The meta-regression reveals that White Americans with low (versus high) levels of anti-Black prejudice show a significantly stronger preference for Black people in advertising [$\beta = 0.5798$, CI (0.1032, 1.0563), $P < 0.05$], see *SI Appendix, Table S5*, Model 2.

Taken together, our additional meta-analyses on the social-psychological moderators suggest that reduced anti-Black prejudice as well as lower ethnic identification among White Americans can offer a plausible explanation for the temporal dynamics we observe across 66 y, from 1956 until 2022. Moreover, despite their static nature, our findings are consistent with interracial attitudes captured by survey results from the American National Election Studies (ANES; 88). Since 1960, the ANES survey includes a so-called feeling "thermometer" measure to collect ingroup versus outgroup attitudes over time, a popular measure to assess interracial and longitudinal attitude shifts (59, 61). While the ingroup attitudes of White Americans have decreased over time, their outgroup attitudes toward Black people have increased (*SI Appendix, Fig. S5*).

Sensitivity Analyses. To test the robustness of our effects, we perform multiple sensitivity analyses. First, instead of adding the publication year as a continuous variable, we use a median split of publication years, consistent with our model-free evidence. For the full-outcome model, the combined effect of White viewers' race in interaction with studies published after 2000 on the effect size is positive and highly statistically significant [$\beta = 0.4995$, CI (0.1926, 0.8064)]. Following Quillian and Lee (19), we additionally split the publication years into three bins (before 2000, 2000 to 2010, and after 2010) to capture potential nonlinearity. Again, we find consistent evidence for a steady increase in White Americans' preference for Black models over time [$\beta_{2000 \text{ to } 2010} = 0.4268$, CI (0.0886, 0.7649), $\beta_{\text{After}2010} = 0.5890$, CI (0.2315, 0.9465); reference category before 2000; see *SI Appendix, Table S6*].

Second, we replace the publication year variable in Model 2 by including the frequencies of the term racial diversity in printed sources counting ngrams from 1956 to 2019 using Google ngram data (*SI Appendix, Fig. S6*). Scheffer et al. (89) show that word trends in books correlate with societal interest changes. Relatedly, Alba and Maggio (36) use ngram data to highlight socio-demographic changes related to assimilation processes in the U.S. Consistent with Model 2, we find the interaction effect of White respondents and the frequencies of racial diversity

being positive and highly statistically significant [$\beta = 3.8038$, CI (1.0798, 6.5279); see *SI Appendix, Table S7*].

Third, by applying keyword-assisted topic models to the study abstracts (90), namely, a semi-supervised topic model based on latent Dirichlet allocation, we control for main topics as a robustness check. The seeding keywords reflect two main streams of research pertaining to interracial advertising: studies that focus on advertising effectiveness for specific target audiences, (e.g., ref. 27) and those that study the theoretical underpinnings, such as prejudice and ethnic identification, (e.g., ref. 43). We present the main terms linked to each topic in *SI Appendix, Table S8*. Controlling for both topics capturing the core focus of the papers, our results and substantive conclusions remain consistent (*SI Appendix, Table S7*).

Fourth, as a placebo test, we include an interaction of the publication year with the gender of the study participants. As expected, the effect of this interaction is statistically insignificant [$\beta = -0.0001$, CI (-0.0005, 0.0002)], even if we add both interaction terms to the model [$\beta = -0.0001$, CI (-0.0005, 0.0003)] (*SI Appendix, Table S9*), in further support of our theorizing about the shift in outgroup preferences among White respondents. The preference shift is driven by viewers' race, not gender, which instead appears unrelated to changes in preference for Black endorsers over time.

Discussion

Summary and Contribution. Based on a meta-analysis of 332 effect sizes, 62 studies, and 52 papers, including more than 10,000 Black and White participants we provide evidence for a gradual shift in White Americans' preference for Black endorsers in advertising in the past 66 y (1956 to 2022). In contrast to predictions based in the theory of ingroup favoritism (82), White consumers do not constantly prefer White endorsers over Black endorsers over time. While, indeed, historically White Americans have exhibited a preference for White models in advertising, more recently they seem indifferent, with directional evidence for a preference for Black models. In contrast, Black viewers constantly favor Black endorsers for the entire 66-y study period. This finding is consistent with distinctiveness theory (76), which posits that Black people (compared to White people) identify more with their race and favor race-congruent advertising characters based on the distinctive traits represented and made salient by ethnic cues. To the best of our knowledge, no other study has examined the dynamics of interracial preferences over such a long period of time.

Our findings thus provide a way to harmonize contradictions in extant literature pertaining to interracial preferences and suggest that interracial preferences require a dynamic perspective. Considering the passage of time that coincides with institutional, cultural, and economic changes is crucial to understand how Black and White Americans react toward Black and White models in advertising. Going forward, socio-demographic and societal changes such as ongoing assimilation processes and continued racial mixing through intermarriage also require consideration in further developing such a dynamic social identity theory (36, 37).

Grounded in the empirical evidence on the most prevalent individual-level moderators studied in the interracial advertising context, the steadily increasing preference among White Americans for Black people in advertising is likely a function of (at least) two concurrent social-psychological forces. First, anti-Black prejudice in the United States among White Americans has reduced since the Civil Rights Movement that coincides with the

beginning of our meta-analytical time window. Second, despite recent increases in White consciousness (49), the increasing heterogeneity of the White American mainstream has presumably lowered ethnic identification and ingroup attitudes among the White population. These concurrent trends resemble the lower (higher) racial attitude of White Americans toward their White ingroup (Black outgroup), as documented in the longitudinal ANES surveys (88). Clearly, the shift in White Americans' preference for Black people is likely a function of the interplay of many more cultural, institutional, and economic changes (41).

This research contributes to the broad literature pertaining to preferences in racial contexts. Our results suggest that advertisers should feature more Black endorsers, as these appeal not only to their Black ingroup but also to White audiences. However, it matters how advertisers represent Black and other minority models in advertising (70). On the one hand, advertising can shape cultural values by promoting social norms and contribute to continuing fighting against racial discrimination by increasing people's exposure to minority models (21). On the other hand, stereotypical media representation can perpetuate racial stereotypes and biases (91). Hence, firms need to be careful in crafting diverse, equitable, and inclusive marketing campaigns to avoid consumer backlash, (e.g., ref. 92).

Limitations and Further Research Directions. The present meta-analysis examined in- and outgroup evaluations based on one salient social identity, namely race. We purposely focused on Black versus White consumers because of data availability as the majority of marketing studies compare these two specific racial groups due to historical legacy, demographic size, and representation. Moreover, as Alba and Maggio (36, p.1) note, in contrast to other ethno-racial groups, the racial boundaries between Black and White have been "stubbornly resistant to major change." Though we controlled for the endorsers' gender, other attributes such as age, body shape, and sexual orientation were not taken into account as they are not consistently reported. Future studies could build on our meta-analysis with other ethno-racial groups to address the issues facing other racial and ethnic groups in the United States. For example, Hispanic and Asian endorsers have been studied in selected marketing studies. Both groups are substantially contributing to the ongoing socio-demographic changes in the United States, shaped by immigration and assimilation (93). Moreover, research studying interracial relations among minority groups appears equally valuable (61).

Furthermore, binary racial classifications are unlikely to appropriately reflect the socio-demographic reality in the future. Mixed-race Americans are underreported in Census data, though many marriages involve non-Hispanic White spouses and members of a racial or ethnic minority (36, 37). Thus, experimental efforts in the future should establish precise measures that incorporate multiracial identification. From a viewer's perspective, a promising research angle is to understand the role of hypodescent in the context of multiracial appearances in advertising (94), i.e., "the tendency to categorize individuals with mixed racial ancestry into the socially subordinate parental race" (35, p.443).

Most studies conducted on racial preferences in advertising are laboratory studies, which may be subject to social desirability biases (83). We address this limitation in our empirical framework by distinguishing between- versus repeated and within-study designs. Consistently, we do not find a methodological change in study designs over time. Also, no effect arises between top- versus nonranked journals or whether race was the sole manipulation of the stimulus. Still, as advertisers increasingly diversify their visual

communication, we may see more field evidence in the future, (e.g., ref. 95), which appears as a fruitful direction for future research in real-world settings.

Relatedly, 72% of effect sizes in our meta-analytical sample comprise student samples, who might be more receptive to minority models in advertising due to their age, education, and political orientation (96). In addition, they are likely less susceptible to status threats compared to working-class White Americans, which could attenuate the positive effects we observe (37). As all these factors might contribute to more favorable reactions toward minority endorsers compared to the "average" White American, we encourage future research to focus more on (more) representative samples (e.g., balancing liberal and conservative participants) when studying interracial preferences as well as to further explore the role of education in addressing racial prejudice (97).

Last, future research can further explore the effect of status threats on diverse advertising portrayals. As consumers maintain autonomy in the degree to which they attend to ads in naturalistic settings, status threats might be less likely to evoke negative biases toward the outgroup compared threat scenarios pertaining to employment and welfare (66, 75). Better understanding how the perceptions of autonomy relate to perceptions of outgroup members offers a promising avenue for future research (98). Relatedly, it appears worthwhile to investigate in more detail how societal landmark events and socio-economic conditions affect White viewers' perceptions of non-White endorsers. For example, we find preliminary evidence that in tense economic contexts, as captured by unemployment rates from the Bureau of Labor Statistics (99), White participants react less favorably to Black endorsers [$\beta = -0.1136$, CI $(-0.2115, -.0156)$, $P < 0.05$; *SI Appendix, Table S10*]. This finding is consistent with the notion that status threats are perceived more strongly in poor economic climates (63, 100), owing to anxiety regarding competition over limited economic resources (61). Additionally, with the increasing prevalence of virtual endorsers in advertising, (e.g., ref. 101), future research can explore the impact and implications of these novel, nonhuman influencers on human threat perceptions. This research could also explore how the degree of the virtual influencers' human-like qualities, including their ethno-racial representation, moderate their perception and effectiveness.

Conclusions

Racial ingroup preferences for White and Black people are more heterogeneous than theoretical frameworks predict. Our meta-analysis resolves empirical contradictions in extant empirical evidence on interracial preferences among Black and White consumers. Specifically, we identify a gradually increasing preference of White Americans for Black people in advertising, which since the turn of the millennium suggests an indifference between Black and White models in advertising. In contrast, the ingroup preference among Black Americans has remained largely unchanged in the past 66 y.

Covering such a long time span and a host of contextual variables allowed us to contribute to a better understanding of "how and why White people speak of People of Color in positive ways one moment and negative the next", with the temporal dimension being a decisive explanatory variable (41, p.1). While the present meta-analysis could shed light on White Americans' interracial preferences over two thirds of a century, recent discussions around White identity and anti-White discrimination underscore the importance to continuously monitor interracial dynamics in the future. We hope our findings

reduced contradictions and complexity in ways that can help advertisers appreciate the power of including racially diverse models in their advertising. The evidence we provide suggests expanded hiring of Black models for advertising campaigns that target broad segments and markets. Our meta-regressions, which control for potential variance across all studies, add empirical insights to the literature spanning social-psychological, economic, marketing, and communication domains.

Materials and Methods

Meta-Analytical Procedure. The procedure of this meta-analysis follows three steps: first, identifying all existing studies measuring the rating of stimuli featuring Black and White endorsers; second, coding studies based on a systematic coding scheme; and third, estimating multi-level meta-regressions to draw conclusions regarding the dynamic effects of interracial preferences in advertising over time. The following section explains all three stages in detail.

Identification of Studies. The standards of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; see *SI Appendix, Fig. S1*) guided our reporting and systematic study identification. We included all published studies providing insights about the rating and perception of Black versus White endorsers by Black versus White people in the United States. All outcomes describing the rating of either the ad or the endorser were coded. To ensure the comparability of measures, we required that these outcomes were measured on an explicit level.

To identify relevant published studies, we searched in bibliographic databases and, afterward, performed a detailed citation search in all studies we identified through the database search. The bibliographic search contained the following databases: Thomson Reuters Web of Science (Social Science Citation Index), EBSCO Business Source Complete, and Google Scholar. Consistent with our focus on the United States, we searched for results in English only. Specifically, we searched for studies by combining terms referring to the race of the endorsers or viewers ("Black or African American or Afro-American" as well as "White or Caucasian") and term combinations like "advertising, advertisements, ad or commercial or marketing or endorser." Excluding duplicates, this procedure identified 5,369 potential studies (*SI Appendix, Fig. S1*). We screened these publications for eligibility, which resulted in our final set of 62 studies from 52 papers that were U.S. based and matched the inclusion criteria. Specifically, only Black and only White endorsers had to be visible on the stimulus material, meaning print, online, or video (see *SI Appendix, Fig. S7* for examples). After the coding and the exclusion of outliers, 332 final effect sizes from 163 White and 169 Black samples remained and were used for further analyses.

Coding and Time Period (1956 to 2022). A list of the dummy-coded moderators with detailed descriptions can be found in *SI Appendix, Table S2*. In total, we coded 21 moderators in each study. The studies' period ranges from 1956 to 2022. *SI Appendix, Table S11* provides a comprehensive overview of the categorization of outcome measures. Reading the table from left to right, the distinction becomes increasingly detailed, from identification- versus nonidentification-related outcomes to concrete outcome measures, e.g., Attitude toward the ad. *SI Appendix, Table S12* reports all scale descriptions.

Multi-Level Meta-Analysis. A meta-analysis is a statistical technique to aggregate multiple independent study designs that investigate a particular phenomenon. Given the inconsistent and partially conflicting results across study settings regarding interracial preference in extant advertising research, we employ a meta-analysis to synthesize these findings. Our way to measure racial preferences is to directly compare the evaluations of Black versus White endorsers by Black versus White U.S. Americans. The appropriate effect size is

Cohen's *d*. Cohen's *d* is a standardized effect size that measures the difference between two group means by considering the two SDs, and the sample size of each experimental group (*n*) (77).

For our analysis, the rating of the White endorsers was always subtracted from the rating of the Black endorsers. If x_1 is the rating of the Black endorser and x_2 the rating of the White endorser, every equation calculating the final effect size is based on (x_1 to x_2). Depending on the given information within each study, we use the appropriate formula to compute Cohen's *d*, taking into account the number of study participants in each experimental group. Most of the studies contain mean ratings and standard deviations, but we further use statistical information of given *t*-tests, *F*-tests, and bivariate regression coefficients. For missing *P*-values, we used the most conservative way of effect-size calculation, assuming a significance value right under the given threshold, e.g., 0.049 for $P < 0.05$, and excluded all effect sizes with unspecified *P*-values above 0.05. Eq. 1 states the calculation of Cohen's *d* for the case of given mean ratings and SDs:

$$d = \frac{x_1 - x_2}{s_{\text{within}}}, \quad [1]$$

$$s_{\text{within}} = \frac{\sqrt{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}}{n_1 + n_2 - 2}.$$

To capture variability not covered by the moderators and control variables, we add a random-effects specification. Random effects contain a variance part that accounts for the variation in effect sizes across studies. This variation can be traced to different variables at the study level as we expect effect sizes to be conditional on the individual study design and do not represent individual independent effects. Therefore, they account for variability among studies and produce the overall effect.

Formally, for our model, we apply a hierarchical random-effects meta-analytic model for the ES_{ij} , with indices *i* denoting each effect size and *j* indicating the study. Predictor variables are either measured at the effect-size level ($E_{k,ij}$) or the study level ($S_{l,j}$). Nested errors are shown at the effect size level (e_{ij}) and the study level (s_j). An additional sampling error due to different studies' sample sizes is added (a_{ij}). All analyses were conducted in R using the package metafor (102).

$$ES_{ij} = \beta_0 + \left(\sum_{k=1}^K \beta_k E_{k,ij} \right) + \left(\sum_{l=1}^L \beta_{K+l} S_{l,j} \right) + e_{ij} + s_j + a_{ij}. \quad [2]$$

Variables at the effect-size level are White viewer, Service vs. products, Non-U.S. brands, Percentage of female respondents, Nonstudent (adult) population, Male models, More than one model in the ad, Nonidentification-related DVs, and Race-related ad slogan.

Variables at the study level are Online participation, Year of publication, Top journal ranking, Within-subject design, Race of endorsers as sole stimulus manipulation, At least one Black author, Top U.S.-American college, State in the Southern U.S., Republican state, Share of Black population, Dynamic ad setting, and Unemployment rate.

IRB/Informed Consent. As we did not conduct experiments ourselves, neither an IRB approval nor informed consent procedures were required.

Data, Materials, and Software Availability. All study data are included in the article and/or *SI Appendix*.

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1. J. J. Donohue III, J. Heckman, Continuous versus episodic change: The impact of civil rights policy on the economic status of blacks. *J. Econ. Lit.* **29**, 1603 (1991).
2. E. O. Wilson, *On Human Nature: With a New Preface* (Harvard University Press, 2004).

3. Y. Wang, M. S. Qin, X. Luo, Y. Kou, Frontiers: How support for black lives matter impacts consumer responses on social media. *Market. Sci.* **41**, 1029–1044 (2022).
4. E. Veresiu, Delegitimizing racialized brands. *J. Assoc. Consum. Res.* **8**, 59–71 (2023).

5. C. Alcorn, Band-Aid will make black and brown flesh-toned bandages (2020). <https://edition.cnn.com/2020/06/12/business/black-band-aids/index.html>. Accessed 24 January 2023.
6. J. Faria, Most effective advertising campaigns in the United States in 2021 (2022). <https://www.statista.com/statistics/1286619/effective-ad-campaigns-usa/#statisticContainer>. Accessed 30 January 2023.
7. Z. O. Dunivin, H. Y. Yan, J. Ince, F. Rojas, Black lives matter protests shift public discourse. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2117320119 (2022).
8. L. Quillian, D. Pager, O. Hexel, A. H. Midtbøen, Meta-analysis of field experiments shows no change in racial discrimination in hiring over time. *Proc. Natl. Acad. Sci. U.S.A.* **114**, 10870–10875 (2017).
9. S. L. Ross, M. A. Turner, Housing discrimination in metropolitan America: Explaining changes between 1989 and 2000. *Soc. Probl.* **52**, 152–180 (2005).
10. K. M. Hoffman, S. Trawalter, J. R. Axt, M. N. Oliver, Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proc. Natl. Acad. Sci. U.S.A.* **113**, 4296–4301 (2016).
11. K. Ukanwa, A. C. Jones, B. L. Turner Jr., School choice increases racial segregation even when parents do not care about race. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2117979119 (2022).
12. M. T. Rizzo, T. C. Britton, M. Rhodes, Developmental origins of anti-black bias in white children in the united states: Exposure to and beliefs about racial inequality. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2209129119 (2022).
13. E. Derenoncourt, C. H. Kim, M. Kuhn, M. Schularick, Wealth of two nations: The U.S. racial wealth gap, 1860–2020*. *Quart. J. Econ.* **qjad044** (2023).
14. R. Block Jr, C. Crabtree, J. B. Holbein, J. Q. Monson, Are Americans less likely to reply to emails from black people relative to white people? *Proc. Natl. Acad. Sci. U.S.A.* **118**, e2110347118 (2021).
15. J. M. Aburto, A. M. Tilstra, G. Floridi, J. B. Dowd, Significant impacts of the COVID-19 pandemic on race/ethnic differences in US mortality. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2205813119 (2022).
16. H. Schuman, *Racial Attitudes in America: Trends and Interpretations* (Harvard University Press, 1997).
17. P. G. Devine, A. J. Elliot, Are racial stereotypes really fading? The Princeton trilogy revisited. *Person. Soc. Psychol. Bull.* **21**, 1139–1150 (1995).
18. K. N. Morehouse, K. Maddox, M. R. Banaji, All human social groups are human, but some are more human than others: A comprehensive investigation of the implicit association of "human" to us racial/ethnic groups. *Proc. Natl. Acad. Sci. U.S.A.* **120**, e2300995120 (2023).
19. L. Quillian, J. J. Lee, Trends in racial and ethnic discrimination in hiring in six western countries. *Proc. Natl. Acad. Sci. U.S.A.* **120**, e2212875120 (2023).
20. M. Aggarwal et al., A 2 million-person, campaign-wide field experiment shows how digital advertising affects voter turnout. *Nat. Hum. Behav.*, 1–10, 7. (2023).
21. L. A. Zebrowitz, B. White, K. Wieneke, Mere exposure and racial prejudice: Exposure to other-race faces increases liking for strangers of that race. *Soc. Cogn.* **26**, 259–275 (2008).
22. B. A. Lienemann, H. T. Stopp, The association between media exposure of interracial relationships and attitudes toward interracial relationships. *J. Appl. Soc. Psychol.* **43**, E398–E415 (2013).
23. J. Navarro, Ethnic background of advertising and promotions managers in the United States in 2021 (2021). <https://www.statista.com/statistics/1179684/advertising-industry-employees-share-by-ethnicity-united-states/>. Accessed 10 February 2023.
24. J. Council, After vows of more diversity, tv commercials and digital ads are getting whiter, survey says (2023). <https://www.forbes.com/sites/jaredcouncil/2023/01/26/after-vows-of-more-diversity-tv-commercials-and-digital-ads-are-getting-whiter-survey-says/?sh=63037c04394c>. Accessed 10 February 2023.
25. M. B. Brewer, The psychology of prejudice: Ingroup love and outgroup hate? *J. Soc. Iss.* **55**, 429–444 (1999).
26. H. Tajfel, J. C. Turner, "The social identity theory of inter group behavior" in *Psychology of Intergroup Relations*, S. Worchel, W. G. Austin, Eds. (Nelson, Chicago, 1986), vol. 3.
27. J. L. Aaker, A. M. Brumbaugh, S. A. Grier, Nontarget markets and viewer distinctiveness: The impact of target marketing on advertising attitudes. *J. Consum. Psychol.* **9**, 127–140 (2000).
28. W. J. Qualls, D. J. Moore, Stereotyping effects on consumers' evaluation of advertising: Impact of racial differences between actors and viewers. *Psychol. Market.* **7**, 135–151 (1990).
29. C. M. Frisby, Does race matter? Effects of idealized images on African American women's perceptions of body esteem *J. Black Stud.* **34**, 323–347 (2004).
30. M. Antioico, J. Vanhamme, A. Hardy, L. Bernardin, On the importance of social integration for minority targeting effectiveness. *Int. J. Res. Market.* **29**, 380–389 (2012).
31. J. T. Jost, M. R. Banaji, B. A. Nosek, A decade of system justification theory: Accumulated evidence of conscious and unconscious bolstering of the status quo. *Polit. Psychol.* **25**, 881–919 (2004).
32. G. W. Allport, *The Nature of Prejudice* (Addison-Wesley Publishing Company 1954).
33. J. Calanchini, K. Schmidt, J. W. Sherman, S. A. Klein, The contributions of positive outgroup and negative ingroup evaluation to implicit bias favoring outgroups. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2116924119 (2022).
34. Race data tables (2022). https://www.census.gov/topics/population/race/data/tables.All.List_523928342.html. Accessed 17 April 2023.
35. J. A. Richeson, S. R. Sommers, Toward a social psychology of race and race relations for the twenty-first century. *Annu. Rev. Psychol.* **67**, 439–463 (2016).
36. R. Alba, C. Maggio, Demographic change and assimilation in the early 21st-century United States. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2118678119 (2022).
37. R. Alba, *The Great Demographic Illusion: Majority, Minority, and the Expanding American Mainstream* (Princeton University Press, 2020).
38. Projecting majority-minority (2014). https://www.census.gov/content/dam/Census/newsroom/releases/2015/cb15-tps16_graphic.pdf. Accessed 24 January 2023.
39. S. Roberts, In a generation, minorities may be the U.S. majority (2023). <https://www.nytimes.com/2008/08/14/washington/14census.html>. Accessed 2 October 2023.
40. C. Wong, G. E. Cho, Two-headed coins or Kandinskys: White racial identification. *Polit. Psychol.* **26**, 699–720 (2005).
41. M. W. Hughey, Superposition strategies: How and why white people say contradictory things about race. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2116306119 (2022).
42. J. W. Cagley, R. N. Cardozo, White response to integrated advertising. *J. Advert. Res.* **10**, 35–39 (1970).
43. O. Appiah, Ethnic identification on adolescents' evaluations of advertisements. *J. Advert. Res.* **41**, 7–22 (2001).
44. A. Jardina, *White Identity Politics* (Cambridge University Press, 2019).
45. D. G. Taylor, P. B. Sheatsley, A. M. Greeley, Attitudes toward racial integration. *Sci. Am.* **238**, 42–49 (1978).
46. J. Sawyer, A. Gampa, Implicit and explicit racial attitudes changed during black lives matter. *Person. Soc. Psychol. Bull.* **44**, 1039–1059 (2018).
47. T. W. Smith, P. V. Marsden, M. Hout, General social survey, 1972–2010 [cumulative file]. (icpsr 31521) (2013). <https://www.icpsr.umich.edu/web/ICPSR/studies/31521>. Accessed 4 October 2023.
48. A. W. Doane, Dominant group ethnic identity in the United States: The role of "hidden" ethnicity in intergroup relations. *Sociol. Quart.* **38**, 375–397 (1997).
49. A. Jardina, In-group love and out-group hate: White racial attitudes in contemporary us elections. *Polit. Behav.* **43**, 1535–1559 (2021).
50. J. Sides, M. Tesler, L. Vavreck, *Identity Crisis: The 2016 Presidential Campaign and the Battle for the Meaning of America* (Princeton University Press, 2019).
51. R. D. Alba, M. B. Chamlin, A preliminary examination of ethnic identification among whites. *Am. Sociol. Rev.* **48**, 240–247 (1983).
52. J. Jetten, R. Spears, M. A. Hogg, A. S. Manstead, Discrimination constrained and justified: Variable effects of group variability and in-group identification. *J. Exp. Soc. Psychol.* **36**, 329–356 (2000).
53. J. Lee, F. D. Bean, America's changing color lines: Immigration, race/ethnicity, and multiracial identification. *Annu. Rev. Sociol.* **30**, 221–242 (2004).
54. D. Storrs, Whiteness as stigma: Essentialist identity work by mixed-race women. *Symb. Interact.* **22**, 187–212 (1999).
55. H. Blumer, Race prejudice as a sense of group position. *Pacific Sociol. Rev.* **1**, 3–7 (1958).
56. H. M. Blalock, *Toward a Theory of Minority-Group Relations* (Wiley, New York, 1967).
57. M. A. Craig, J. A. Richeson, On the precipice of a "majority-minority" America: Perceived status threat from the racial demographic shift affects white Americans' political ideology. *Psychol. Sci.* **25**, 1189–1197 (2014).
58. F. Danbold, Y. J. Huo, No longer "all-American"? Whites' defensive reactions to their numerical decline. *Soc. Psychol. Person. Sci.* **6**, 210–218 (2015).
59. J. Sides, M. Tesler, L. Vavreck, "Donald trump and the rise of white identity politics" in *Proceedings of 2016 US Presidential Election: Tumult at Home, Retreat Abroad* (2017), pp. 1–36.
60. M. A. Craig, J. A. Richeson, Information about the US racial demographic shift triggers concerns about anti-white discrimination among the prospective white "minority". *PLoS One* **12**, e0185389 (2017).
61. M. A. Craig, J. A. Richeson, More diverse yet less tolerant? How the increasingly diverse racial landscape affects white Americans' racial attitudes *Person. Soc. Psychol. Bull.* **40**, 750–761 (2014).
62. H. Bai, C. M. Federico, Collective existential threat mediates white population decline's effect on defensive reactions. *Group Process. Intergr. Relat.* **23**, 361–377 (2020).
63. L. Quillian, Prejudice as a response to perceived group threat: Population composition and anti-immigrant and racial prejudice in Europe. *Am. Sociol. Rev.*, 586–611 (1995).
64. N. Sirola, M. Pitesa, Economic downturns undermine workplace helping by promoting a zero-sum construal of success. *Acad. Manage. J.* **60**, 1339–1359 (2017).
65. K. M. Perkins, A. Toskos Dils, S. J. Flusberg, The perceived threat of demographic shifts depends on how you think the economy works. *Group Process. Intergr. Relat.* **25**, 227–246 (2022).
66. R. Wetts, R. Willer, Privilege on the precipice: Perceived racial status threats lead white Americans to oppose welfare programs. *Soc. Forces* **97**, 793–822 (2018).
67. M. Levy, D. Myers, *Forecasts and Frames: Narratives about Rising Racial Diversity and the Political Attitudes of US Whites* (Los Angeles University of Southern California, 2018).
68. T. F. Pettigrew, L. R. Tropp, A meta-analytic test of intergroup contact theory. *J. Person. Soc. Psychol.* **90**, 751 (2006).
69. L. R. Tropp, T. F. Pettigrew, Relationships between intergroup contact and prejudice among minority and majority status groups. *Psychol. Sci.* **16**, 951–957 (2005).
70. A. Röbner, M. Eisend, Ethnic minorities in advertising. *J. Advert.* **52**, 1–11 (2023).
71. C. L. Wilkins, C. R. Kaiser, Racial progress as threat to the status hierarchy: Implications for perceptions of anti-white bias. *Psychol. Sci.* **25**, 439–446 (2014).
72. A. Vandermaas-Peeler et al., Partisan polarization dominates trump era: Findings from the 2018 American values survey. *Resour. Doc.* **1**, 5–4 (2018).
73. B. M. Riek, E. W. Mania, S. L. Gaertner, Intergroup threat and outgroup attitudes: A meta-analytic review. *Person. Soc. Psychol. Rev.* **10**, 336–353 (2006).
74. B. Major, A. Blodorn, G. Major Blascovich, The threat of increasing diversity: Why many white Americans support trump in the 2016 presidential election. *Group Process. Intergr. Relat.* **21**, 931–940 (2018).
75. L. Baccini, S. Weymouth, Gone for good: Deindustrialization, white voter backlash, and US presidential voting. *Am. Polit. Sci. Rev.* **115**, 550–567 (2021).
76. W. J. McGuire, C. V. McGuire, P. Child, T. Fujioka, Salience of ethnicity in the spontaneous self-concept as a function of one's ethnic distinctiveness in the social environment. *J. Person. Soc. Psychol.* **36**, 511 (1978).
77. P. Cohen, S. G. West, L. S. Aiken, *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (Psychology Press, 2014).
78. D. Moher, A. Liberati, J. Tetzlaff, D. G. Altman, P. Group, Reprint-preferred reporting items for systematic reviews and meta-analyses: The Prisma statement. *Phys. Therapy* **89**, 873–880 (2009).
79. J. Cohen, *Statistical Power Analysis for the Behavioural Sciences* (Lawrence Erlbaum Associates, Hillsdale, NJ, ed. 2, 1988).
80. H. R. Rothstein, A. J. Sutton, M. Borenstein, "Publication bias in meta-analysis" in *Publication Bias in Meta-Analysis: Prevention, Assessment and Adjustments* (2005), pp. 1–7.
81. R. Nieuwenhuis, M. te Grotenhuis, B. Pelzer, influence.ME: Tools for detecting influential data in mixed effects models. **4**, 38–47 (2012).
82. H. Tajfel, J. C. Turner, "The social identity theory of intergroup behavior" in *Political Psychology* (Psychology Press, 2004), pp. 276–293.
83. C. Schamp, M. Heitmann, T. H. Bijmolt, R. Katzev, The effectiveness of cause-related marketing: A meta-analysis on consumer responses. *J. Market. Res.* **60**, 189–215 (2023).
84. K. McLeod, Authenticity within hip-hop and other cultures threatened with assimilation. *J. Commun.* **49**, 134–150 (1999).

85. J. Navarro, Inclusion and diversity in advertising and marketing in the United States – statistics & facts (2023). <https://www.statista.com/topics/7118/diversity-and-inclusion-in-advertising-in-the-us/#topicOverview>. Accessed 11 October 2023.
86. J. S. Phinney, The multigroup ethnic identity measure: A new scale for use with diverse groups. *J. Adolesc. Res.* **7**, 156–176 (1992).
87. J. C. Brigham, College students' racial attitudes. *J. Appl. Soc. Psychol.* **23**, 1933–1967 (1993).
88. ANE Studies, Time series cumulative data file (1948–2020) (2022). <https://electionstudies.org/data-center/anes-time-series-cumulative-data-file/>. Accessed 16 September 2023.
89. M. Scheffer, I. van de Leemput, E. Weinans, J. Bollen, The rise and fall of rationality in language. *Proc. Natl. Acad. Sci. U.S.A.* **118**, e2107848118 (2021).
90. S. Eshima, K. Imai, T. Sasaki, Keyword assisted topic models. arXiv [Preprint] (2020). <http://arxiv.org/abs/2004.05964> (Accessed 10 February 2023).
91. M. Weisbuch, K. Pauker, N. Ambady, The subtle transmission of race bias via televised nonverbal behavior. *Science* **326**, 1711–1714 (2009).
92. T. W. Post, Pepsi tried cashing in on black lives matter with a Kendall Jenner ad. Here's how that's going (2017). <https://www.washingtonpost.com/news/wnk/wp/2017/04/05/pepsi-tried-cashing-in-on-black-lives-matter-with-a-kendall-jenner-ad-heres-how-thats-going/>. Accessed 13 October 2023.
93. R. D. Alba, V. Nee, *Remaking the American Mainstream: Assimilation and Contemporary Immigration* (Harvard University Press, 2003).
94. D. Peery, G. V. Bodenhausen, Black+ white= black: Hypodescent in reflexive categorization of racially ambiguous faces. *Psychol. Sci.* **19**, 973–977 (2008).
95. G. M. Herek *et al.*, Culturally sensitive aids educational videos for African American audiences: Effects of source, message, receiver, and context. *Am. J. Commun. Psychol.* **26**, 705–743 (1998).
96. R. A. Peterson, On the use of college students in social science research: Insights from a second-order meta-analysis. *J. Consum. Res.* **28**, 450–461 (2001).
97. R. Alba, R. G. Rumbaut, K. Marotz, A distorted nation: Perceptions of racial/ethnic group sizes and attitudes toward immigrants and other minorities. *Soc. Forces* **84**, 901–919 (2005).
98. A. Aldama, C. Bicchieri, J. Freundt, B. Mellers, E. Peters, How perceptions of autonomy relate to beliefs about inequality and fairness. *PLoS One* **16**, e0244387 (2021).
99. B of Labor Statistics, Labor force statistics from the current population survey (2023). <https://data.bls.gov/pdq/SurveyOutputServlet>. Accessed 11 September 2023.
100. L. Quillian, Group threat and regional change in attitudes toward African-Americans. *Am. J. Sociol.* **102**, 816–860 (1996).
101. X. Zhou, X. Yan, Y. Jiang, Making sense? The sensory-specific nature of virtual influencer effectiveness. *J. Market.* 00222429231203699 (2023).
102. W. Viechtbauer, Conducting meta-analyses in R with the metafor package. *J. Stat. Softw.* **36**, 1–48 (2010).