The Price of Racial Bias: Intergroup Negotiations in the Ultimatum Game

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Decision-making researchers in the 20th century initially emphasized two tenets: that individuals (a) are rational in their decisions and (b) are motivated to maximize their own financial gain (Becker, 1978; Downs, 1957). During the evolution of judgment and decision-making science, Kahneman and Tversky (1979) began to challenge assumptions of a rational, utility-maximizing decision maker (Dawes & Thaler, 1988). It became clear that a host of psychological and emotional factors color the decision process, resulting in decision biases (Camerer & Loewenstein, 2004; Kahneman & Tversky, 2000; Loewenstein & Lerner, 2003). One prominent factor in many everyday interactions that may influence the decision process and compromise its rationality is racial group membership.

When individuals are free to allocate resources as they see fit, they generally make equitable offers to in-group and out-group members (Jetten, Spears, & Manstead, 1996; Jost & Azzi, 1996). However, the degree of equity in offers to members of racial out-groups varies as a function of participants' race bias, such that individuals with stronger implicit race bias are less equitable (Stanley, Sokol-Hessner, Banaji, & Phelps, 2011). Other studies have shown that when forced to allocate resources, or when responding to allocated offers, people favor in-group over out-group members (Diekmann, Samuels, Ross, & Bazerman, 1997; Tajfel, 1970). The economic decisions in these studies, however, were made at no cost to the decision makers. When personal gain is at stake, people may be even less equitable. The goal of the present research was to determine whether discrimination in economic decisions would ever occur at the expense of personal financial gain.

Because there exist cultural associations of Black American males with aggression, hostility (Dovidio, Brigham, Johnson, & Gaertner, 1996), and untrustworthiness (Dotsch, Wigboldus, Langner, & van Knippenberg, 2008), individuals may be more likely to perceive a low financial offer as unfair when the offer comes from a Black rather than White individual. To study whether self-interest will be set aside because of stereotypic and prejudicial associations, we sought to create an economically costly situation in which the race of the individual players varied. Economically costly decisions have been observed in the Ultimatum Game, in which one player (i.e., the proposer) is endowed with a sum of money at the beginning of each round and decides how to divide up the money between him- or herself and another player (i.e., the responder). The responder can then accept the proposed split or reject it. If the responder accepts the split, the money is divided according to the proposer's offer. If he or she rejects the offer, both players get nothing. Responders reject low offers (~20% of the total endowment) half the time, even when the economically maximizing strategy is to accept them (Bolton & Zwick, 1995; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003; Thaler, 1988). This occurs, in part, because responders punish proposers for unfair treatment (Pillutla & Murnighan, 1996). Thus, perceptions of fairness in the Ultimatum Game are inversely related to the likelihood of rejecting an offer.

The focus of the research reported here was on how differential levels of group-based trust influence economic decision making. Lower levels of trust (Dotsch et al., 2008) in the motives of Black Americans and stereotypes of aggression and hostility (Dovidio et al., 1996) may cause individuals to perceive a low financial offer as more unfair when it comes from a Black rather than a White proposer. Therefore, objectively identical low offers may be rejected more often when offered by a Black than a White proposer, and it may require larger offer amounts for responders to accept Black proposers' offers. If race-based associations guide responding to offers, participants with stronger negative race associations should be more likely to exhibit race bias in accepting offers (Stanley et al., 2011), even when this increases their personal cost.

Method

Participants

Forty-nine (28 females, 21 males) native English-speaking individuals participated in exchange for $10 and received additional compensation based on the outcome of their Ultimatum Game responses (for a priori exclusion criteria, see Information on Participants and Other-Race Analyses in the Supplemental Material available online). The ethnic-racial distribution of the sample was as follows: 27 Whites, 6 Black Americans, 6 Asians, 1 Hispanic, 2 Middle Easterners, 6 biracial or multiracial individuals, and 1 other-race individual. Participants were recruited from the New York University campus and surrounding community.

Procedure

Ultimatum Game. Participants always played the role of the responder. On each trial, participants ostensibly played with a new proposer whom they were told had participated in a previous Ultimatum Game experiment (see Procedural Details and Supplemental Discussion in the Supplemental Material). The proposers varied by race (60 White males, 60 Black males, and 40 other-race males of Asian, Middle Eastern, and Hispanic descent; photographs of the proposers were shown in color). Because aggression, hostility, and untrustworthiness are more closely linked to Black American males than females, for this initial exploration, all proposers were male (Sesko & Biernat, 2010). Other-race proposers were included to decrease participants' awareness that the experiment was about responses to Black versus White proposers.[1] Offers were always splits of $10. Across the three proposers' racial groups, the distribution and mean of the offers were equivalent (offer range: $0–$3.80, M = $1.94, SD = $0.99). Participants were told that if they accepted an offer, they would receive that payout and that the researchers would mail the proposer a check for his share of the money. Players had 4 s to decide on each offer; following a decision, the intertrial interval was 1 to 5 s (duration randomly selected). If they failed to respond within 4 s, a warning message appeared, requesting that they respond faster, and then the study automatically advanced to the next trial. The final payouts were based on three randomly selected trials (maximum possible outcome = $11.40).

To reinforce the believability of the social exchange, we told participants during the introduction that their picture would be taken at the end of the experiment and that they would make five offers to be used as proposals for future participants. Participants' contact information was collected at the end of the experiment, and they were told that if future responders accepted their offers, we would mail them a check for their winnings. Before beginning the experiment, participants took a short quiz to verify their understanding of the game rules.

To estimate response functions for the Ultimatum Game, we used a logistic function to fit the slope and point of indifference between accepting and rejecting an offer, separately for each individual participant's data. The slope allows for estimation of the participant's

sensitivity to the fairness of the offers, and the point of indifference allows for estimation of the offer amount at which a participant is as likely to accept as to reject an offer. Changes in the proportions of acceptance across offer amounts were modeled using a using a maximum likelihood method:

$$p(\text{accept}) = \frac{1}{1 + e^{-(mx-D)}}$$

The acceptance rate is determined by both m, the slope, and D, the point of indifference for each subject (x is the offer size). Scrutiny of these data revealed separation in the fitting of the logistic function. To reduce bias in the estimation and allow for finite parameter estimates, we performed logistic function estimation (logistf function in R) using Firth's (1993) penalized-likelihood logistic regression. Additionally, the proportion of offers accepted and response latencies were calculated after removal of timed-out trials.

Implicit race bias. After the decision-making task, participants completed an Implicit Association Test (IAT) that measured their strength of association between races (Black/White) and attributes (pleasant/unpleasant). Using the procedures described by Lane, Banaji, Nosek, and Greenwald (2007), we asked participants to respond accurately and rapidly with a right-hand key press to items from one race and one attribute category (e.g., "Black" and "unpleasant"), and with a left-hand key press to items from the remaining two categories (e.g., "White" and "pleasant"). During evaluation-incongruent blocks, "Black" and "pleasant" (e.g., *terrific, nice*) items shared a labeled response key, and "White" and "unpleasant" (e.g., *terrible*, *foul*) items shared a labeled response key. During evaluation-congruent blocks, these pairings were switched.

Participants' IAT D scores were calculated using the algorithm developed by Greenwald, Nosek, and Banaji (2003). D scores greater than 0 indicate pro-White bias (i.e., faster response latencies when "White" and "pleasant" were paired than when "Black" and "pleasant" were paired).

The IAT D score has a possible range of −2 to +2 (Nosek, Banaji, & Greenwald, 2002). White participants on average have IAT scores above 0; however, non-White participants, although more variable in their D scores, can similarly show pro-White IAT bias (Nosek et al., 2002). This is because participants of different racial groups have been exposed to similar racial stereotypes. Although participants—non-White as well as White—may not explicitly endorse these stereotypes, this exposure to cultural attitudes can still influence their behavior through implicit channels (Lane et al., 2007). Therefore, to increase the between-subjects variance and to allow for estimation across the full range of D scores, we included all participants in the analyses (see Stanley et al., 2011, for a similar practice). However, we also report results of analyses of subsamples, which confirmed that non-Black and White participants showed effects in the same direction as those observed for the entire sample; we report these analyses with a note of caution regarding the reduction in statistical power due to decreases in sample size.

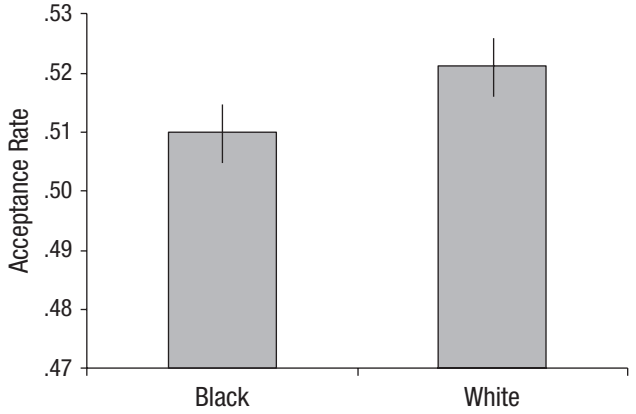

Fig. 1. Acceptance rate as a function of proposer's race. Error bars represent ±1 *SE*.

Results

Acceptance rates

To assess how racial group membership of the proposer affects responding during the Ultimatum Game, we compared acceptance rates for Black and White proposers independent of the participant's race. The overall acceptance rate across all offers was .52 (range: .11–.93, SD = .22). Analyses revealed significantly greater acceptance of White compared with Black proposers' offers, $F(1, 48) = 5.48$, $p = .02$, $\eta_p^2 = .10$ (Fig. 1).[2]

The overall acceptance rate among non-Black participants was .48 (range: .11–.91, SD = .23).[3] Results revealed significantly greater acceptance rates for White proposers' offers (M = .49) compared with Black proposers' offers (M = .48) in this subsample, $F(1, 35) = 4.84$, $p = .04$, $\eta_p^2 = .12$.[4] The overall acceptance rate for the White participants was .44 (range: .11–.91, SD = .22). Among White participants, the difference in acceptance rates between Black (M = .44) and White (M = .45) proposers failed to reach significance because of a substantial loss of power, $F(1, 26) = 2.34$, $p = .14$, $\eta_p^2 = .08$, although it was directionally similar to the effect obtained for the full sample and for non-Black participants.

Modeling behavior

To explore participants' sensitivity to the fairness of offers and to determine the offer amount required for participants to accept an offer, we fit data using a logistic function. From the logistic curve, each participant's slope and point of indifference (probability of acceptance = .5) were estimated, and these values were compared between the two races of proposers. Repeated measures analyses of variance (ANOVAs) revealed different slopes, $F(1, 48) = 4.58$, $p = .04$, $\eta_p^2 = .09$, and points of indifference, $F(1, 48) = 12.45$, $p < .01$, $\eta_p^2 = .21$, between Black and White proposers (Table 1). Participants had steeper slopes for Black proposers than for White proposers, which suggests that participants were more sensitive to small changes in the offer amount when offers came from Black proposers, and were flexible in their decisions across a wider range of offers for White proposers. Additionally, participants' points of indifference were greater for Black than for White proposers; larger offer amounts were required for players to accept offers from Black proposers.

The repeated measures ANOVAs for the non-Black participants revealed significantly different slopes, $F(1, 35) = 4.54$, $p = .04$, $\eta_p^2 = .12$, and points of indifference, $F(1, 35) = 6.78$, $p = .01$, $\eta_p^2 = .16$, between Black and White proposers. Participants had steeper slopes for Black ($M = 9.56$) than for White ($M = 8.07$) proposers. Additionally, individuals' points of indifference were greater for Black proposers ($M = 1.90$) than for White proposers ($M = 1.86$). The ANOVAs for White participants also revealed different slopes, $F(1, 26) = 5.08$, $p = .03$, $\eta_p^2 = .16$, and points of indifference, $F(1, 26) = 4.26$, $p = .05$, $\eta_p^2 = .14$, between Black and White proposers. Participants had steeper slopes for Black ($M = 10.01$) than for White ($M = 8.31$) proposers. Additionally, individuals' points of indifference were greater for Black ($M = 2.05$) than for White ($M = 2.01$) proposers.

Table 1. Results From Individual Estimates of Participants' Response Functions: Means and Standard Deviations for Slopes and Points of Indifference

	Slope		Point of indifference	
Race of proposer	Mean	*SD*	Mean	*SD*
Black	8.78	5.19	1.86	0.75
White	7.60	4.50	1.81	0.76

Note: Means for both slope and point of indifference differed significantly between Black and White proposers, $p < .05$.

Response latency

If race attitudes guide responding, it may be the case that participants employed a dichotomizing strategy when responding to Black proposers' offers, allowing underlying evaluations, and not deliberate consideration of each individual offer, to drive decisions. To investigate this possibility, we analyzed log response times as a function of proposer's race across all offers. Results supported the hypothesis that participants spent less time considering Black proposers' offers, as they were faster to accept offers from Black ($M = 1.10$ s) than from White ($M = 1.12$ s) proposers, $F(1, 48) = 66.77$, $p < .01$, $\eta_p^2 = .58$ (Fig. 2).

Non-Black participants were faster to make decision about offers from Black ($M = 1.13$ s) than from White ($M = 1.15$ s) proposers, $F(1, 35) = 42.50$, $p < .01$, $\eta_p^2 = .55$. White participants were also faster to accept offers from Black ($M = 1.17$ s) than from White ($M = 1.20$ s) proposers, $F(1, 26) = 25.43$, $p < .01$, $\eta_p^2 = .49$.

Acceptance rates and implicit race bias

To further explore what factors predict racial bias in acceptance rates (i.e., accepting more offers from White than from Black proposers), we conducted hierarchical regression modeling examining four factors: (a) race bias in point of indifference (i.e., how much lower the point of indifference is for White vs. Black proposers), (b) IAT *D* scores, (c) race bias in reaction time (i.e., how much faster responses are to Black vs. White proposers' offers), and (d) race bias in offer sensitivity (i.e., how much steeper the slope is for Black vs. White proposers).[5] In Step 1, race bias in the point of indifference was the

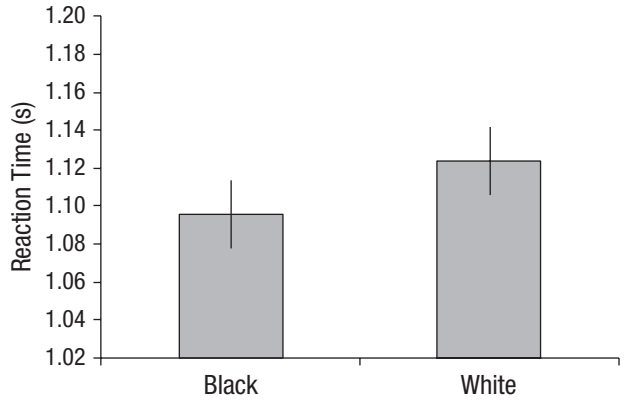

Fig. 2. Reaction time as a function of proposer's race. For ease of interpretation, this figure depicts raw reaction times, but all analyses were performed on log-transformed reaction times. Error bars represent ±1 *SE*.

independent variable. In Step 2, *D* scores were added as a predictor. In Step 3, bias in reaction time was added as a third independent variable. In the final step, race bias in offer sensitivity was added as a fourth independent variable. We examined collinearity prior to hierarchical modeling, and tolerances were above .87.

Step 1 revealed a significant relationship between point of indifference and race bias in acceptance rates ($\beta = 0.86$), $t(48) = 11.50$, $p < .01$, $r^2 = .74$. When implicit bias (IAT *D* score) was added as a predictor, it predicted race bias in acceptance rates over and above the effect of point of indifference ($\beta = 0.22$), $t(48) = 3.21$, $p < .01$, $pr^2 = .18$. Moreover, including implicit bias as a predictor in the model accounted for 4.8% of additional variance in acceptance rates, $\Delta r^2 = .048$, $\Delta F(1, 46) = 10.33$, $p < .01$. The addition of reaction time bias and race bias in slopes did not account for additional variance in acceptance rates, and neither emerged as a significant predictor in the full, non-Black, or White sample. These results indicate that, perhaps not surprisingly, participants who require larger offer amounts to accept Black, compared with White, proposers' offers also accept fewer offers from Black proposers. Additionally, greater implicit bias as measured with the IAT, controlling for the other factors, predicts accepting fewer offers from Black compared with White proposers.

Discussion

The ordinary functioning of social and economic life consists of innumerable interactions in which one human being makes an offer to another, and the offer must be accepted or rejected. The recipient of the offer, if rational, should evaluate the objective quality of the offer and maximize personal gain. However, as previous research has shown, other factors can and do intervene to erode the rational interpretation of an offer. Rejecting low offers is always irrational, but the level of irrationality increases when people reject even larger offers because of the proposer's race. In the experiment reported in this article, we found that (a) the race of the proposer intervened to erode the rationality of participants' decisions and (b) participants' implicit race bias was predictive of their likelihood of accepting offers. Furthermore, players seemed to use a different strategy when responding to Black proposers compared with White proposers, as indicated by the consideration of a smaller range of offers and faster decisions in the former case. Note that racial bias in offer decisions was evident even though it was detrimental to participants' personal financial gain.

In the Ultimatum Game, rejection of unfair offers is correlated with anger ratings (Pillutla & Murnighan, 1996) and physiological arousal (van 't Wout, Kahn, Sanfey, & Aleman, 2006). Because we did not directly assess participants' motivations or emotions, it is difficult to verify that they were motivated by anger to punish Black proposers. But, given that unfair offers elicit anger (Pillutla & Murnighan, 1996) and Black Americans are stereotyped as aggressive, hostile (Dovidio et al., 1996), and untrustworthy (Dotsch et al., 2008), participants may have had increased anger toward Black proposers' unfair offers (see Procedural Details and Supplemental Discussion in the Supplemental Material).

Social psychological theories extend self-interest to the in-group (Brewer, 1979; Sidanius, Pratto, & Mitchell, 1994; Tajfel & Turner, 1986). Although the research reported here focused primarily on how stereotypes of Black Americans influence decision making in the Ultimatum Game, an alternative explanation for why we observed greater acceptance of White proposers' offers is that participants extended self-interest motives to their in-group. At first glance, White participants' data support the assertion that in-group interests may have motivated White participants to accept more offers from White proposers. However, when analyzing the data for the other-

violations of fairness are punished even at the expense of personal gain.

Author Contributions

J. T. Kubota and J. Li developed the study concept. All authors contributed to the study design. Testing and data collection were performed by J. T. Kubota, J. Li, and E. Bar-David. J. T. Kubota and J. Li performed the data analysis and interpretation under the supervision of M. R. Banaji and E. A. Phelps. J. T. Kubota drafted the manuscript, and J. Li, M. R. Banaji, and E. A. Phelps provided critical revisions. All authors approved the final version of the manuscript for submission.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Supplemental Material

Additional supporting information may be found at http://pss.sagepub.com/content/by/supplemental-data

Notes

1. Results for the other-race proposers were not the focus of this experiment. Attitudes and stereotypes about racial groups vary, and the groups included in the other-race category (Asian, Hispanic, and Middle Eastern) are in some instances associated with nonoverlapping stereotypes and prejudices. Interested readers should see Information on Participants and Other-Race Analyses in the Supplemental Material for exploratory analyses of the data for other-race proposers.
2. Three participants (2 White and 1 Asian) accepted nearly all offers and were excluded from the analyses (see Information on Participants and Other-Race Analyses in the Supplemental Material). One participant accepted every offer from White and other-race proposers and 98% of the offers from Black proposers, 1 participant accepted every offer from White and Black proposers and 98% of the offers from other-race proposers, and 1 participant accepted every offer from all proposers.
3. We excluded from the non-Black group participants who reported their race as "other" or who reported that they were multiracial, to ensure that this subsample was non-Black. Other-race and multirace participants were not asked for more specific information on their racial identification.
4. The fact that the pattern of results remained across each subsample lends further support to the reliability and stability of these effects. Although a few of the analyses failed to reach significance when we parsed the sample, this can be attributed to the large reduction in power (i.e., 49 participants in the overall sample dropped to 27 participants in the White-only sample).
5. It is important to sample the full range of IAT scores when assessing a correlation. So as not to restrict the range of data, we examined the regressions across all participants and did not analyze the data by subsample.

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