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## Implicit racial bias and prosocial behavior

Irena Stepanikova\*, Jennifer Triplett, Brent Simpson

Department of Sociology, University of South Carolina, Columbia, South Carolina 29208, USA

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### ABSTRACT

This paper reports results of an experiment on the relationship between whites' implicit racial bias and prosocial behavior toward blacks. We hypothesized that implicit anti-black bias would lead to less prosocial behavior (generosity with limited monetary resources). Consistent with our hypothesis, the results revealed that implicit anti-black bias, measured by the Implicit Association Test, had a negative effect on generosity toward blacks. This finding extends prior work by showing that implicit racial bias affects *non-hypothetical* decisions about how to allocate limited monetary resources. We conclude with a discussion of implications and suggestions for future work.

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### 1. Introduction

Why do racial inequalities stubbornly persist despite the fact that Americans' racial attitudes have become increasingly egalitarian (Campbell, 1971; Dovidio and Gaertner, 1986; Karlins et al., 1969; Gaertner and Dovidio, 2005; Pager and Shepherd, 2008)? One explanation for this paradox is based on implicit anti-minority attitudes (Dunham et al., 2006; Gaertner and McLaughlin, 1983; Rudman et al., 2001). These attitudes, studied for several decades by psychologists, but scarcely addressed in other disciplines, differ from explicit racial attitudes captured by surveys in several important ways: they operate to a larger degree (though not completely) outside of conscious awareness and are typically not identified via introspection (e.g., Greenwald and Banaji, 1995; Greenwald et al., 1998). Implicit anti-minority attitudes are widespread in America even among people who openly reject racism (Nosek et al., 2007).

A crucial assumption behind the claim that implicit racial attitudes buttress systemic racial inequalities is that these attitudes lead to observable actions that disadvantage minorities. Yet, evidence linking implicit attitudes to racially biased behavior is limited (McConnell and Leibold, 2001). Much of the existing research concentrates on responses to survey items or hypothetical scenarios, rather than actual, observed, behaviors. The behavioral evidence that does exist mostly pertains to spontaneous behaviors that are difficult to control, such as subtle non-verbal expressions of hostility in interracial interaction (Chen and Bargh, 1997; Fazio et al., 1995; Dovidio et al., 1997a,b, 2002). Less is known about the relationship between implicit racial attitudes and deliberate, more easily controllable actions, such as decisions about the allocation of material resources that may disadvantage minorities.

At the same time, some evidence suggests that implicit attitudes *in general* strongly predict controllable behaviors. Greenwald et al. (2009) conducted a meta-analysis of studies measuring implicit cognitions of race/ethnicity, gender, age, self-feelings, drugs/tobacco, relationships, and consumer, political, and clinical issues. On average, such broadly defined implicit cognitions predicted both difficult and easy to control behaviors (e.g., eye blinking vs. voting). While suggestive, this meta-analysis did not distinguish implicit racial attitudes from implicit attitudes toward other categories or objects. As a result, it remains unclear whether *racial* attitudes influence easily controllable behaviors.

\* Corresponding author.

E-mail address: [irena@sc.edu](mailto:irena@sc.edu) (I. Stepanikova).

Given this suggestive, but inconclusive evidence, it is important to directly assess the impact of implicit racial attitudes (as opposed to implicit attitudes defined more broadly) on controllable (as opposed to spontaneous) behavior. Although the importance of spontaneous behaviors in interracial interaction should not be downplayed (Dovidio et al., 2002; Vorauer and Kumhyr, 2001; Chen and Bargh, 1997), the lack of evidence linking implicit racial attitudes to deliberate and controllable behavior is an important obstacle to an understanding whether and how such biases contribute to systemic inequalities.

The goal of this study is to provide such evidence by addressing the relationship between implicit racial attitudes and generosity. We measure this relationship in a controlled laboratory experiment, operationalizing generosity as a voluntary decision about how to distribute limited monetary resources between self and another person. This measure enables us to make several unique contributions, which we briefly discuss below.

First, generosity is a key type of *prosocial behavior*. Various forms of prosocial behavior, including generosity, altruism, fairness, and trust are critical for social interactions and social order in general and have therefore received extensive interdisciplinary attention (see, Piliavin and Charng, 1990 and Penner et al., 2005 for reviews). Here we address how implicit racial attitudes, a prevalent form of racial biases in contemporary society, affect prosociality.

Second, as noted earlier, little is known about the effects of implicit racial biases on *easily controllable behaviors*, as opposed to more spontaneous behaviors such as facial expressions or speech hesitations. Because inequality can stem from a range of controllable behaviors (e.g., hiring and salary decisions and distribution of scarce resources more generally), it is important to understand the impact of implicit cognition on such behaviors. Our measure of generosity, which has research participants decide how to distribute money between self and another person, may therefore yield insights into the role of such behaviors in ongoing racial inequalities.<sup>1</sup>

Third, our dependent measure is an *observable and non-hypothetical behavior*, as opposed to survey responses or behaviors in hypothetical scenarios studied previously. We cannot assume that survey and hypothetical responses correspond to actual behavior (Ajzen et al., 2004; Bohm, 1972; Buchbinder et al., 2004; LaPierre, 1934; Murphy et al., 2005), and we currently have little evidence on whether implicit bias affects behavioral discrimination.

Finally, we focus on a type of behavior that has the potential to *tangibly disadvantage minorities*, as opposed to types of behavior that may affect minorities in more subtle ways, e.g., by exposing them to hostile non-verbal cues. We measure generosity with money, a highly valued resource. This is important, given that the denial of material resources based on race contributes to continuing race-based inequalities more generally.

The remainder of this paper describes implicit racial attitudes and reviews the limited available evidence linking them to behavior. Thereafter, we propose a hypothesis specifying how implicit racism affects the allocation of monetary resources toward blacks. We then present the results of a new experiment designed to test this hypothesis. As predicted, results show that whites with higher levels of implicit anti-black bias are less generous toward a black dependent other than are whites with lower levels of implicit bias.

## 2. What are implicit attitudes and how are they measured?

Implicit attitudes involve “the introspectively unidentified (or incorrectly identified) traces of past experience that mediate attributions of qualities to members of social categories” (Greenwald and Banaji, 1995, p. 15). They are activated from memory quickly and spontaneously by exposure to relevant stimulus cues in the environment (Wittenbrink et al., 2001). Implicit biases correlate only weakly to moderately with explicit attitudes (Nosek et al., 2007).

Implicit attitudes cannot be measured by standard attitudinal surveys that rely on the respondent’s capacity for introspection (Rudman et al., 2001). Researchers therefore developed several indirect means of capturing them. By far the most common method, and the one used in the current research, is the Implicit Association Test (IAT) developed by Greenwald and colleagues (1998). The logic of the IAT capitalizes on the well-established tendency for people to respond more quickly to concepts that are closely associated in their minds (e.g., Greenwald and Banaji, 1995; Greenwald et al., 1998). The IAT can be used to measure attitudes toward a variety of topics. The version measuring racial attitudes tracks how quickly participants respond to images of black and white faces and value-laden words that correspond to concepts of “good” or “bad.” Differences in response latencies are taken as evidence of a stronger association between concepts. Most white participants respond much faster to a combination of a white face and a “good” word (or a black face and a “bad” word) compared to the “white/bad” or “black/good” combination (Greenwald et al., 1998), which suggests an implicit anti-black attitude. In fact, regardless of whether the IAT or another measure is used, results show that a majority of whites hold implicit biases against blacks (Devine, 1989; Devine et al., 2002; Dovidio et al., 1997a,b; Fazio et al., 1995). Whites show the highest levels of anti-black implicit attitudes but some degree of anti-black implicit bias is found also among American Indians, Asians, and Hispanics (Nosek et al., 2007).

Researchers have debated whether the IAT measures factors other than implicit bias. Critics have pointed to several potential influences on IAT results, including knowledge of cultural stereotypes, difference in familiarity with the ingroup vs. outgroup, and “statistical discrimination” (Arkes and Tetlock, 2004; Tetlock and Mitchell, 2008). A detailed review of this

<sup>1</sup> By claiming that generosity with monetary resources represents controllable behavior, we do not suggest that it is completely governed by conscious deliberation or that it is completely under rational control. By using the label “controllable,” we follow Greenwald et al. (2009) to distinguish behaviors that are relatively easy to control from those that are more difficult to control, such as facial expression, gesturing, and para-verbal aspects of speech.

debate is beyond the scope of this paper (see, for instance, Duster, 2008) and we believe that researchers have satisfactorily addressed criticisms of the IAT (see, among others, Quillian, 2008; Banaji et al., 2004; Nosek et al., 2007; Greenwald et al., 2009). For instance, if IAT scores simply reflected knowledge of cultural stereotypes, blacks should have elevated IAT scores, since they are repeatedly reminded of anti-black stereotypes in their daily lives. But this is not what the data show (Banaji et al., 2004). Similarly, data from blacks do not fit the familiarity explanation. Blacks are obviously familiar with own group; yet, in a large-scale study, almost half of blacks showed implicit anti-black bias (Nosek et al., 2007).

Evidence reviewed by Banaji et al. (2004), Quillian (2008), and Greenwald et al. (2009) suggest good predictive validity of the IAT, especially for spontaneous or difficult-to-control behaviors. We should reiterate, however, that there is currently much less evidence for a link between implicit attitudes and controllable behaviors, especially in the domain of race (see Greenwald et al., 2009). We contend that implicit racial attitudes, as measured by the racial IAT, predict *non-hypothetical* prosocial behaviors. Before detailing the study designed to test this contention, we briefly review what we already know about how implicit racial attitudes affect behavior.

### 3. Implicit racial attitudes and behavior

Implicit racial attitudes have been linked to a number of non-verbal and para-verbal behaviors, such as less friendly facial expressions, limited eye contact (Bargh et al., 1996; Chen and Bargh, 1997; Fazio et al., 1995), decreased speaking time, and more speech errors and hesitation (Dovidio et al., 2002; McConnell and Leibold, 2001). These behaviors are generally considered unintentional and are relatively difficult to consciously control (Muller, 1992; Pennycock, 1985).

We address whether implicit attitudes affect behaviors that are typically considered to be consciously controlled. Prior work shows that other types of unconscious influences can impact such behaviors. For instance, Kay and colleagues (2004) found that participants in a bargaining task were less generous toward a partner when interacting in a room with an inconspicuously placed briefcase versus a backpack. These effects occurred even though participants did not consciously register the presence of the briefcase or backpack. The authors reasoned that participants were unconsciously primed for competitive (business-like) behavior by the presence of the briefcase. Similarly, prior work shows that prosocial behavior is affected by subliminally priming participants with such factors as morality versus power (Smeesters et al., 2003), warmth versus coldness (Williams and Bargh, 2008), and religious versus neutral concepts (Shariff and Norenzayn, 2007). We argue that implicit racial bias has similar effects on prosocial behavior.

Findings from a number of previous studies, while not conclusive, offer suggestive evidence of a link between implicit racial bias and consciously controlled behaviors. Consider, for instance, studies of physicians' decisions about care for hypothetical patients. Stepanikova (2007) experimentally activated implicit anti-black biases among physicians and found that these physicians considered the condition of a patient described in a vignette less serious compared to the physicians whose anti-black biases were not activated. Green and colleagues (2007) found that doctors with higher IAT scores (indicating greater implicit racial bias) were less likely to use thrombolysis to treat hypothetical myocardial infarction among black patients compared to white patients. (Note, however, that a similar study with pediatricians [Sabin et al., 2008] failed to find a relationship between racial IAT scores and medical decisions). Finally, a study using hypothetical decision-scenarios asked students to recommend allocation of budget cuts to student organizations (Rudman and Ashmore, 2007). Compared to students with lower implicit racial biases, those with higher implicit racial biases were more likely to recommend cuts to minority organizations.

These studies yield important insight into the link between implicit racial biases and non-hypothetical behavior, but they have two notable limitations. First, these studies focus on specific contexts (either medical care or student organizations). Thus, it remains to be seen whether the patterns apply across more general contexts. Second, and perhaps more importantly, all these studies measure responses to hypothetical scenarios. The experiment outlined below was designed to address the limitations of prior work. First, the experiment uses a standard, *non-hypothetical behavioral measure* of prosociality to assess how implicit black bias affects generosity toward blacks in an experimental setting. Second, the study provides a *more general context* for decision making than has been previously utilized.

### 4. Implicit bias and outgroup bias

People tend to favor others from their own social categories and disfavor those from other social categories. For instance, they tend to be less helpful towards outgroup members than they are toward ingroup members, work harder for their ingroups, and are more likely to restrain their self-interest for the good of the group (Brewer and Kramer, 1986; Dovidio et al., 1997a,b; Kramer and Brewer, 1984; Levine et al., 2005; Worchel et al., 1998). In addition, outgroup bias can affect attitudes toward ingroup and outgroup members during conflicts (Gaertner et al., 1993; Jackson, 2002). Perhaps most importantly for our purposes, generosity towards dependent others decreases when the other is an outgroup member (Billig and Tajfel, 1973; Vaughn et al., 1981).

Of particular relevance for our purposes is how outgroup bias, based on race category, can affect prosocial behavior, as shown in experimental work. For instance, Simpson et al. (2007) measured trust within and between race categories using a standard behavioral experiment with monetary stakes. As expected, white participants trusted other whites more than they trusted blacks, while black participants trusted other blacks more than they trusted whites. The present research

addresses whites' generosity toward black dependent others and, specifically, how this generosity depends on implicit racial bias. We expect that implicit anti-black biases will negatively affect prosocial behavior when the dependent other is black.<sup>2</sup> Specifically, we hypothesize that:

*Compared to whites with lower levels of implicit anti-black bias, whites with higher levels of implicit anti-black bias are less generous toward black dependent others.*

The section to follow outlines a laboratory experiment designed to test this hypothesis.

## 5. Materials and methods

### 5.1. Design

A total of 124 non-Hispanic white students (40% female) were recruited from introductory courses at a large public university in the southeastern US. The data collection took place in two sessions. The first session, completed online, involved a socio-demographic questionnaire. The second session took place in the laboratory and involved participants making decisions in a dictator game before taking the IAT. Participants were scheduled in groups of three to eight. Upon entering the laboratory, each participant was escorted to a private participant room, where he or she completed a consent form and read instructions. Thereafter, we introduced the manipulation (partner demographics) and measured generosity and implicit racial attitudes.

### 5.2. Dependent measure

Our dependent measure is behavior in a one-shot dictator game (Eckel and Grossman, 1996; Hoffman et al., 1996). A wide range of behavioral measures of prosocial behavior have grown out of experimental work in behavioral economics, including measures of trust and trustworthiness (Berg et al., 1995; Glaeser et al., 2000), and fairness (Bolton and Ockenfels, 2000). The dictator game is the standard behavioral measure of altruism and generosity in economics (e.g., Eckel and Grossman, 1996; Hoffman et al., 1996), as well as social psychology (Benenson et al., 2007; Zhong et al., 2010) and sociology (Simpson and Willer, 2008; Willer, 2009).

In the standard version of the game, a participant is given a monetary endowment. He or she then decides how much, if any, of the endowment to give to another participant, who is completely dependent on that decision. Thus, the decision pits individual self-interest against generosity (Hoffman et al., 1996). Because any amount transferred entails a loss to the participant, the measure specifically targets *costly generosity*, sometimes referred to as altruism. Importantly, behavior in dictator games correlates with generosity and charitable giving in non-laboratory contexts (see Bekkers, 2007). Our measure should therefore have implications for generosity and charitable giving in a range of real-world contexts.

In our study, the first task participants engaged in was a dictator game. All participants were assigned to the Dictator role.<sup>3</sup> The Dictator received 16 points, each worth 50 cents, and had to decide how much, if any, to pass onto a dependent partner (i.e., the Receiver). The Dictator kept any amount not sent. For instance, if the Dictator decided to send 10 points (\$5) out of their total of 16 (\$8) to the Receiver, the Dictator kept six points (\$3). Thus, participants faced an entirely voluntary decision about how much, if any, of a valued resource to allocate to a dependent partner. Since the Receiver's payment in the game was determined by the Dictator, subjects' behaviors had meaningful consequences for another real person.

### 5.3. Manipulation

Prior to making their decision in the dictator game, participants were given information about their partner's (the Receiver's) ostensive race and gender. Specifically, before completing instructions for the dictator game, a research assistant brought the participant an "information sheet" containing the demographic characteristics of both the participant and the other person with whom the participant was paired. To reinforce the information on the partner's race and gender, the experimenter read all the demographic characteristics aloud to the participant and asked them to "double check" that their information was correct. In reality, although participants' partners were real, we manipulated the demographic information about the partner, based on randomly assigned conditions. In particular, we randomized race ("black" or "white") and gender ("male" or "female"). Although the partner's gender is not a theoretical concern for us, we wanted to ensure that our findings did not depend on one specific gender.<sup>4</sup>

<sup>2</sup> We limit the current investigation to whites' behavior because whites tend to have higher anti-black bias and control more valued resources in society. Thus, we think the most important first step is an understanding of whether and how whites' implicit biases influence their decisions about resource distribution in interracial interaction. Later, we suggest some extensions of the current work to non-white populations.

<sup>3</sup> All participants also played a second game as the "Receiver," i.e., they received payment sent to them by another student assigned to the role of "Dictator." They were told explicitly that they had a new partner in this game, thus removing any possibility of reciprocity with regards to their original "Receiver".

<sup>4</sup> Previous evidence suggests that the genders of decision makers and partners may play a role in decisions scenarios like the dictator game (Andreoni and Vesterlund, 2001; Eckel and Grossman, 1998). One study, for instance, reported more competition and retaliation when the bargaining partners had the same gender versus when they had the opposite gender (Sutter et al., 2009). Because the partner's gender may alter behavior directly, or via interaction with the participant's gender, we manipulated the ostensible gender of the partner.

The partner's race is an important variable in our study. We hypothesize that bias will predict generosity specifically toward black partners. However, to ensure that this relationship is driven by the hypothesized process, we need to rule out the possibility that lower giving because of anti-black bias is related to selfishness to others in general, regardless of their racial backgrounds. To rule out this alternative explanation, our experiment randomly assigned the race of the receiving partner either as black or white. Thus, half of participants were told they were paired with a black partner and half were told they were paired with a white partner. We use results from participants who believed they were paired with a black partner to test our key hypothesis, and results from participants who believed their partner was white to rule out the alternative explanation. Note that we do not make a specific prediction about how anti-black bias relates to behaviors toward white partners. It is conceivable that anti-black bias will not predict behavior toward white partners. Alternatively, it may be that anti-black bias necessarily implies a pro-white bias, in which case generosity toward whites would be negatively related to anti-black bias. What is important, for current purposes, is that we show that greater anti-black bias is *not* associated with greater selfishness toward white partners.

#### 5.4. Implicit racial bias

After the participant made his or her decision in the dictator game, a research assistant turned on a computer in the participant's room and told the participant she would begin another part of the study, which was the Implicit Association Test (IAT). Note that we carefully considered the issue of ordering the IAT and the dictator game. Even though administering the IAT before the generosity measure would enhance causal interpretation of results, we chose to measure implicit racial attitudes after generosity. Our decision was guided primarily by concerns about suspicion and social desirability bias. Since IAT transparently focuses on racial bias by asking respondents to match clearly valenced concepts, such as good or bad, with images of black or white faces, exposure to this test could lead to a heightened awareness of the purpose of the study. This heightened awareness, in turn, could have resulted in consciously modified behavior on the generosity measure due to social desirability, particularly when the ostensible interaction partner was black. The measurement of the dependent variable before IAT is consistent with previous work that grappled with this methodological issue (e.g., Amodio and Devine, 2006; Green et al., 2007; Rudman and Ashmore, 2007; also see Greenwald et al., 2009).

The IAT test, described in detail elsewhere (Greenwald et al., 1998), is a valid and reliable tool used widely in research on implicit attitudes (e.g., Greenwald et al., 2006; Ito et al., 2006; Lane et al., 2007; Nosek and Smyth, 2007). It measures the strength of association between categories such as European American versus African American and words that represent evaluative attributes of good (*joy, laughter, and happy*) versus bad (*hurt, evil, and awful*). African Americans and European Americans are represented by images of faces created by digital morphing of photographs. As such, they do not represent real persons and cannot be familiar to any participant. The test assumes that the faster the response to the pairings of these concepts, the stronger the two concepts are associated in the subject's mind. Relatively fast responses to stereotypical pairs, such as European American/good and African American/bad and relatively slow responses to counter-stereotypical pairs, such as European American/bad and African American/good, indicate implicit anti-black bias.

The IAT includes practice blocks that serve to familiarize the participant with the task. Practice blocks are not scored. We utilized a standard design with five practice blocks and two test blocks, the latter of which are scored. Each practice block included 21 trials, while each test block included 40 trials. Since the IAT examines both stereotypical and counter-stereotypical associations, we randomized whether a subject received the stereotypical or the counter-stereotypical association task first. If a participant made an error, she had to correct it before continuing. The entire IAT procedure took about 15 minutes.

The IAT scoring was performed using the "dbiep" (*D*) algorithm proposed by Greenwald et al. (2003) and updated for greater precision by the authors in 2007. (The algorithm is available at [http://faculty.washington.edu/agg/iat\\_materials.htm](http://faculty.washington.edu/agg/iat_materials.htm).) As recommended by these authors, we used both the trials in which a participant made an error and those in which there were no errors. We excluded trials with extremely long latencies (longer than 10,000 ms). The authors further recommend dropping subjects with extreme IAT scores and very high average latencies as well as participants with excessively fast latencies (less than 300 milliseconds). We did not have any such subjects. Therefore, all subjects were retained for the analyses reported below.

#### 5.5. Social value orientations

After finishing the IAT, participants completed a social value orientation (SVO) inventory. Social value orientations are stable preferences for the distribution of outcomes between self and others (Liebrand et al., 1986). SVO measures have established temporal stability (van Lange, 1999) and predict a range of social behaviors (Liebrand et al., 1986). Most importantly for current purposes, SVO has a strong impact on decisions in the dictator game (Simpson and Willer, 2008), similar social decisions in real-world contexts (Van Lange et al., 2007), as well as several other types of prosocial behaviors (De Cremer and Van Lange, 2001; McClintock and Allison, 1989; Nauta et al., 2002; van Vugt et al., 1996). In addition, social value orientations predict variables that correlate with racial attitudes, such as authoritarianism and universalism (Garling, 1999; Kuhlman and Marshello, 1975; Parks, 1994). The relationships between SVO, prosocial behavior and correlates of racial attitudes make it important to control for SVO in multivariate models to rule out the possibility of a spurious relationship.

The measure presents participants with a series of nine scenarios, each consisting of three different distributions. Subjects are instructed to imagine that they are randomly paired with another unidentified person and to choose a distribution of

**Table 1**  
Characteristics of the sample.

	Mean	SD	Range
Generosity (dollars sent)	2.72	1.93	.00–8.00
Implicit anti-black bias	.59	.37	–.10–1.20
Prosocial SVO (0/1)	.49		
Male participant (0/1)	.59		
Male interaction partner (0/1)	.54		

Notes: SD = standard deviation. SVO = social value orientation.  $N = 61$ . All participants are non-Hispanic whites.

points for themselves and for this person that best satisfies their preferences. Based on their choices, each participant is classified as “proself” (a person who seeks to either maximize the payoff to self, without regard to the payoff to other, or a person who seeks to maximize the difference between the payoff to self and other) or “prosocial” (a person who seeks to maximize aggregate payoffs and/or to minimize inequality in payoffs to self and other). This dichotomization is preferable to treating the SVO measure as continuous for both empirical and theoretical reasons. Empirically, the responses have a bimodal distribution with modes toward the extremes of the continuum, making the treatment of the variable as continuous problematic. Theoretically, researchers typically contrast behaviors of prosocial individuals with proself individuals. Thus, the dichotomization is consistent with previous studies (e.g., Simpson and Willer, 2008; Van Lange, 1999). As in those studies we classified participants as proself if they made at least six out of nine choices consistent with that value orientation and prosocial if they made at least six prosocial choices.

After completing the social value orientation measure, participants were paid, fully debriefed, and dismissed. As a part of the debriefing, the research assistant asked a series of questions designed to assess comprehension and suspicion. No participants reported being suspicious of any aspect of the study, and there were no comprehension problems.

## 6. Results

About half of participants ( $N = 61$ ) were told that they were paired with a black partner. Data from these 61 participants were used for hypothesis testing, and are shown in Tables 1–3. Participants sent an average of about a third of their \$8 endowments to their Receiver, and kept about two thirds for themselves. These numbers are similar to those found in prior studies using this measure (e.g., Simpson and Willer, 2008).

Most participants had positive scores on the measure of anti-black implicit bias, indicating that they responded faster to stereotypical pairs of concepts, such as African American/bad compared to counter-stereotypical pairs of concepts, such as African American/good. This result is consistent with prior work suggesting a general tendency toward implicit anti-black bias among US whites (e.g., Dunham et al., 2006; Nosek et al., 2007). Participant SVOs were approximately equally distributed between “prosocials” and “proselfs.” A slight majority of participants were male.

To examine bivariate relationships between generosity and the independent variables used in subsequent multivariate analysis, we estimated simple linear regression models. Generosity served as the dependent variable and each predictor was entered separately. The results are reported in Table 2. The relationship between implicit anti-black bias and generosity is negative but not significant ( $p = .076$ ). Participants classified as “prosocial” displayed more generosity compared to those classified as “proself” ( $p < .001$ ). Other variables did not show significant bivariate associations with generosity.

To formally evaluate our hypothesis, we estimated a multivariate linear regression model of the effects of implicit anti-black bias on generosity toward black partners. To rule out potential spurious relationships, the model controlled for the participant’s and the partner’s genders. As explained above, prior research shows that the genders of both the decision-maker and his or her partner can affect behavioral outcomes (Andreoni and Vesterlund, 2001; Croson et al., 2008; Eckel and Grossman, 1998; Stockard et al., 1988). In addition, gender relates to implicit racial biases (Nosek et al., 2007). Thus, existing findings point to the need to control for gender. We also control for SVO and for the ordering of blocks in the IAT. Table A1 in Appendix A shows correlations among the predictors.

Table 3 reports the results of multivariate analysis. The results lend support to our hypothesis by demonstrating that implicit anti-black bias has a significant, negative effect on generosity toward a black partner ( $p = .009$ ). This means that participants with higher levels of implicit anti-black bias gave less money to black partners compared to participants with lower levels of bias. The magnitude of this effect is considerable: participants at the 20th percentile of bias sent about twice as much to black dependent others as did their counterparts at the 80th percentile. Among the control variables, only SVO predicted generosity. Its effect was consistent with previous research showing greater generosity among people with prosocial value orientation compared to those with proself orientation (Simpson and Willer, 2008).<sup>5</sup>

We also conducted a supplementary multivariate analysis of generosity toward whites. As discussed above, the purpose was to make sure that bias was *not* associated with lower generosity toward partners *in general* (i.e., both blacks and whites).

<sup>5</sup> We also estimated a model that included an interaction between the subject and partner gender but found no significant effect.

**Table 2**  
Bivariate relationships between generosity (dollars sent) and independent variables.

	Coeff.	SE	p-value
Implicit anti-black bias	-.213	.634	.076
Prosocial SVO	.477	.438	<.001
Male participant	.035	.506	.786
Male interaction partner	.055	.499	.674
First IAT block: "European American/good"	.027	.490	.110

Notes:  $N = 61$ . All participants are non-Hispanic whites. Standardized coefficients from six simple linear regression models of generosity are shown. Each row represents a separate model. SVO = social value orientation. SE = standard error.  $p$ -values are from two-tailed tests.

**Table 3**  
Standardized coefficients from multivariate linear regression models of generosity (dollars sent) toward black partners.

	Coeff.	SE	p-value
Implicit anti-black bias	-.291	.606	.009
Prosocial SVO	.508	.429	<.001
Male participant	-.118	.420	.278
Male interaction partner	.063	.436	.580
First IAT block: "European American/good"	.212	.444	.072

Notes:  $N = 61$ . All participants are non-Hispanic whites. SVO = social value orientation. SE = robust standard error.  $p$ -values are from two-tailed tests.

We observed no effects of implicit anti-black bias on generosity toward white partners (see Table A2 in Appendix A). This finding rules out the possibility that the negative relationship between racial bias and generosity is driven by greater general selfishness among more biased individuals, regardless of the race of the target. Instead, our findings suggest that the observed relationship is specific to black targets, as predicted.

## 7. Discussion

This paper is a first attempt to address a key question in the literature on implicit cognition: how does implicit racial bias affect prosocial behavior? As noted earlier, whereas previous studies have focused on hypothetical allocations, the current research examined actual behavior toward real partners who were ostensibly black in the context of a controlled decision-making context. Understanding how implicit racial bias affects actual behavior is important since the relationship between actual behavior and hypothetical allocations is imperfect at best (Bohm, 1972; see also Murphy et al., 2005).

A second important feature of the current study is that its main outcome, prosocial behavior, is typically believed to be largely under conscious control. With a few exceptions, previous research on implicit racial bias has focused on outcomes that typically bypass conscious decision-making, such as non-verbal behavior (e.g., facial expressions and body position) or para-verbal behavior (e.g., speech pauses and hesitations). However, the impact of implicit racism on decisions that are typically assumed to be under conscious control has not received much attention, despite the fact that such decisions are critical in the context of racial inequalities. For instance, explicit anti-discriminatory policies often regulate decisions regarding minorities in areas such as employment, education, banking, housing, criminal justice, and medical care (Cohn, 2000; Deitch et al., 2003; Walker et al., 1999; Williams et al., 2003). Importantly, the results just reported suggest that even decisions about valued resources such as money may be subject to the influence of unacknowledged racial attitudes. Because decision-makers are often unaware of their implicit biases, they may not be cognizant of the extent to which these biases influence their decisions. This may be one of the reasons that racial inequalities have persisted despite anti-discriminatory policies.

Finally, the study reported above focused on limited resource allocation, an issue relevant to a range of real-world settings. In work environments, for instance, resources contributing to career advancement, such as access to training, travel money, and funds for hiring an administrative assistant are almost always limited and may be affected by implicit racial bias. Racial disparities can also be seen in life-or-death decisions. Transplant organs, for instance, are a highly valued but extremely limited commodity (DuBose and Ali, 2008). Despite that fact that procedural policies are in place to guarantee that available organs go to those in greatest need, equally qualified black candidates still remain on waiting lists longer than their white counterparts (Smedley et al., 2003).

Of course we are not suggesting that the findings from our stylized laboratory experiment can or should be directly generalized to real-life decisions like the distribution of transplant organs or hiring and promotion. In fact, there may be important differences in the behavior toward a partner in an experimental context and behavior toward real people outside of a laboratory. We do believe, however, that our results provide compelling evidence of the impact of implicit biases on behavior that decision makers typically assume to be under conscious control. Furthermore, as noted earlier, prior work established

parallels between decisions in dictator games and behaviors in real-life settings (Bekkers, 2007). As such, our findings lay fertile ground for future studies on the impact of biases on allocation behaviors in real life contexts.

The current research is just a first step and a number of important questions remain. The first one concerns the robustness of the findings presented here. One line of evidence on robustness could come from studies focusing on a range of real-world contexts, such as education, work, volunteer organizations, charitable contributions, and the criminal justice system. Another promising line of research would address the impact of racial bias among non-whites. Like most prior research, our study focused on the impact of whites' implicit anti-black bias. Yet, as noted earlier, previous research has found that anti-black bias is surprisingly common among blacks (Nosek et al., 2007). The question thus becomes: do implicit biases translate into behaviors that disfavor one's own social category?

Another question concerns whether the effects of anti-black bias on prosocial behavior can be mitigated. Findings from prior work are suggestive and promising. Based on a review of experimental evidence, Blair (2002) concludes that individuals can modify their automatic prejudice if they are highly motivated to preserve an unprejudiced self-image, or if the situation demands an unbiased response and they are motivated to respond appropriately. A greater focus on these and other types of situational factors that counter implicit biases is an important and promising agenda for future research. Such work is especially important given evidence on the prevalence of implicit racial biases in American society (Gaertner and Dovidio, 2005; Pager and Shepherd, 2008) and the possibility that these biases may continue to affect social interactions, despite increases in explicit egalitarian attitudes. We believe that a better understanding of both the breadth of situations in which racial bias affects behavior, as well as the ways in which these effects can be circumvented, provide a challenging but important research agenda for social scientists.

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## Appendix A

**Table A1**

Pairwise correlations among variables used as predictors in the model reported in Table 3.

	IAB	Prosocial SVO	Male participant	Male partner
Prosocial SVO	.108 (.407)			
Male participant	.133 (.306)	.220 (.089)		
Male partner	-.008 (.952)	-.081 (.535)	.169 (.193)	
First IAT block: European American/good	.198 (.126)	.150 (.247)	.331 (.009)	.239 (.064)

Notes:  $N = 61$ . IAB = implicit anti-black bias. SVO = social value orientation.  $p$ -values from two-tailed tests in parentheses.

**Table A2**

Standardized coefficients from multivariate linear regression models of generosity (dollars sent) toward white partners.

	Coeff.	SE	$p$ -value
Implicit anti-black bias	-.063	.540	.587
Prosocial SVO	.409	.395	.001
Male participant	.019	.410	.870
Male interaction partner	.187	.391	.097
First IAT block: "European American/good"	-.031	.457	.805

Notes:  $N = 63$ . SVO = social value orientation. SE = robust standard error. All participants are non-Hispanic whites.  $p$ -values are from two-tailed tests.

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