

# An Experimental Test of Prejudice toward Foreign People<sup>1</sup>

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First version: August 2010; this version: May 2012

## Abstract

This paper offers two related issues: (*i*) an application of beliefs about the cooperative behavior of others to policy-oriented issues; and (*ii*) a method of exploring racial prejudices where the subjects are oblivious of its purpose. We studied contributions and guesses about others' contributions in an experimental game. Prejudice is examined as a two-sided, implicitly held belief by Spanish college students toward any of the specified foreign population groups (i.e. Africans, Asians, Latin Americans and Westerners).

The results show that subjects tend to harbor mixed feelings toward foreigners. However, racial prejudices do not have unique determinants across the foreign groups under study nor do the determining factors work in similar directions as observed with some significant variables such as individual net worth, beliefs about income status, religious intensity and societal cooperation.

**JEL:** C91, H41, J15

**Keywords:** Beliefs, Prejudice, Public Good Game

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<sup>1</sup>We acknowledge and warmly appreciate the comments and suggestions from Fernando Aguiar, Natalia Jimenez, Nikos Georgantzis, Ramon Cobo-Reyes, Rosemarie Nagel and Tibor Neugebauer; and also the financial aid from MCI (ECO2010-17049) and Junta de Andalucía (PO7-SEJ-02547). Martha Gaustad revised the English grammar

# 1 Introduction

”It required years of labor and billions of dollars to gain the secret of the atom. It will take a still greater investment to gain the secrets of man’s irrational nature. It is easier...to smash an atom than a prejudice” (p. xvii).

Gordon Allport (1954/1988)

Dasgupta (2009) points out that cooperation is based on mutual trust, and trust is based on beliefs. There are many papers in Experimental Economics that deal with the extraction of beliefs. Notwithstanding, in this paper we present a methodology for exploring the beliefs a group of people hold about others (foreign groups of people) as an instance of the utility of beliefs for policy-oriented issues in particular. The specific question we pose is: Do Spanish students believe that Asians are more/less/equally cooperative than/as Spanish people?

Why should one care about the beliefs about others’ cooperative behavior? Firstly, beliefs about others’ behavior are at the basis of strategy selection (see Dasgupta, 2009). On the other hand, in a country with a great number of immigrants it is of interest to investigate whether natives hold prejudices about certain foreign groups or not. Thus, beliefs about the cooperative behavior of foreigners in a country are not necessarily fallouts from xenophobia, but could rather be a means of discerning how foreigners are expected to adapt to the labor market and the public life of the host society. In other words, these beliefs depict the hosts’ expectations of how foreigners will cooperate in the host community when working as team members in the job market, behaving responsibly by paying taxes and avoiding criminal tendencies.

Prejudice can be defined as an implicitly held belief about an individual or a group of individuals based solely on a faulty or inflexible generalization about the classes or groups to which they belong; most often in terms of orientation, race, gender, age and religion.<sup>2</sup> This prejudice can be expressed in the form of a negative (positive) feeling toward an individual or a group of individuals that does not (does) belong to one’s choice group. In support of the former perspective is Becker’s (1957, 1971) formal depiction of racial preferences as “an aversion to cross-racial interaction”, while in support of the latter view, Goldberg (1982) models racial sentiment not as distaste for blacks, but instead as nepotism or favoritism toward whites.

Prejudice can negatively impact on a target individual or group through physical, psychological, and structural harm. This occurs physically in terms of stress and physical attacks that can affect the victims’ health; psychologically,

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<sup>2</sup>Orientation in this context refers to the predisposition of an individual or a group of individuals in favor of something e.g. ideology, sexual orientation, etc. For instance, prejudice can be against a socialist, a homosexual, etc.

in terms of creating and internalizing negative beliefs about oneself thereby resulting in lowered self-esteem or a damaged personal identity; and structurally, in terms of restrictions of access to opportunities or information that can be used for personal or group advancement (see Barrett and Swim, 1998).

A direct approach of eliciting racial prejudices among people is seldom feasible as the strong normative prohibition against discrimination in modern societies tends to make the overt expression of prejudicial views by people or in institutional policies archaic as was the case of apartheid in South Africa. Thus, it becomes an arduous task to devise an alternative, credible and indirect approach of eliciting the real underlying racial beliefs without the subjects being aware. Our paper makes a contribution in this regard by presenting a method to explore prejudices (toward others) through a laboratory experiment.

This study examines the existence of prejudices toward foreigners among 152 college students through guesses about contributions of others within the framework of a public good game. We: *(i)* test the hypothesis that there is no racial prejudice among college students; and *(ii)* examine the causal factors of racial prejudice. Prejudice is examined as a two-sided, implicitly held belief toward any of the specified foreign population groups: Africans, Asians, Latin Americans and Westerners;<sup>3</sup> and models of racial beliefs are then fitted for the four foreign groups.

The results show that subjects tend to harbor mixed feelings toward foreign groups (negative feelings toward Africans and Latin Americans, and warm glows toward Asians and Westerners). In a similar vein, at the individual level there exist some subjects that tend to harbor strong positive (and negative) prejudices toward foreigners. The fitted prejudice models also show that *individual net worth*, *beliefs about income status*, *religious intensity* and *societal cooperation* have significant influences on racial prejudice, but the main result of the study is the absence of unique determinants of racial prejudice across all the foreign groups.

The remainder of this paper is structured as follows. The next section reviews the related literature, while the third section focuses on the methodology employed by describing the experimental design, the data used, and the method of analysis. The fourth section presents the results in two forms: aggregate behavior, and individual behavior. The fifth section is dedicated to the discussion of the results. Finally, conclusions are presented in the sixth section.

## 2 Some Previous Work

Following Allport's (1954/1988) treatise entitled "The Nature of Prejudice", extensive research on prejudice and its correlates such as discrimination and stereotypes, among others, has focused on: *(i)* the people, that is, the perpetrators and victims of prejudice; *(ii)* the contextual environment in which prejudice occurs such as employment, sports, politics, academics, housing and the likes;

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<sup>3</sup>Westerners are defined in this study as "native English language speakers" such as the British, the Americans, etc.

(*iii*) disciplinary perspectives such as sociology, social psychology, behavioral economics etc.; and (*iv*) the types or forms of prejudice.

Existing works that focus on people tend mostly toward people holding prejudiced beliefs at the expense of the target individuals or victims of prejudice. This category includes [25] classic work on stigma, and the treatises on the social psychology of prejudice by Duckitt (1992) and Brown (1995). Researchers that focus on the victims of prejudice usually employ a three-process approach to conduct their investigations which involves (*i*) encountering prejudice; (*ii*) consequences of prejudice; and (*iii*) coping with prejudice. Included in this category is Feagin and Sikes' (1994) report from targets of discrimination. Importantly, any one-sided research conducted solely from either the perpetrators' perspectives or the victims' perspectives will have strong limitations. For instance, under-reporting is common among perpetrators because of the strong normative prohibition against discrimination in modern societies and the attendant risk of legal sanctions; while perceptions rather than reality are often captured in many victim-based works on prejudice which often result in over-statements of the material facts.

From the contextual perspective, of note is Becker's (1957, 1971) classic study on prejudice, which centers on labor market discrimination. His formal analysis focuses on the relationship between racial prejudice among whites and discrimination against racial minorities in a competitive model. He shows that, in equilibrium, "black" relative wages are determined by the most prejudiced employer (the marginal discriminator) with whom they come into contact. Thus, the racial wage gaps in Becker's models are determined by the prejudice of this marginal discriminator, and not by the average levels of prejudice among employers (see Kerwin and Guryan, 2007). An extension of this result to other spheres may likely provide explanations for racial gaps in housing, wealth, health and criminal justice as well. Other explanations put forth for discrimination that do not depend on racial prejudice include: (*i*) imperfect information in statistical discrimination models (see Aigner and Cain, 1977; Altonji and Pierret, 2001); (*ii*) imperfect competition in dual labor markets and local monopsony models (see Doeringer and Piore, 1971; Black, 1995); and (*iii*) racial differences in productivity (see Neal and Johnson, 1996).

From the disciplinary perspective, economists use several models to examine the existence and effects of racial prejudices. These include border models, search models, and the prisoner dilemma game, among others (see Bailey, 1959; Courant, 1978; Smolensky et al., 1968), while psychologists deconstruct prejudice using paradigms such as authoritarian personality, social learning, social identity and others to explain how individual prejudice is acquired and maintained (see Adorno et al., 1950; Bandura, 1977; Tajfel et al., 1986). As an attitude, prejudice also has functional utilities such as knowledge, adjustive (instrumental), value-expressive and ego-defensive functions as suggested by Katz (1960) in his theory on attitudinal functions.

Research on the types or forms of prejudice explore such concepts as: (*i*) old and new prejudice; (*ii*) implicit and explicit prejudice; (*iii*) automatic prejudice;

(*iv*) modern or symbolic prejudice etc.<sup>4</sup> This category includes Gonsalkorale et al. (2009), Kinder and Sears (1981), and Uhlmann et al. (2006). In general, the new forms of prejudice are subtle in nature and are opposed to changes in implicitly held beliefs based on ethical standards that a target individual or group will conform to or violate such as traditionally-held values on free enterprise, inter-personal relationships, personal liberty, religious freedom, etc.

Audit studies which employ a quasi-experimental methodology are also used to detect prejudice; the principal motivating force behind discrimination in employment and housing. Such studies include Pager (2003), Bertrand and Mullainathan (2004), Riach and Rich (1991) and Bendick et al. (1994) in the labor market; and [42], Turner and Ross (2005), Wienke et al. (1979) and [39] in the housing sector. Two weaknesses of the approach put forth by Heckman and Siegelman (1993) are that: (*i*) audit studies are not double-blind, which tends to increase the likelihood of the auditors altering their behavior to confirm the purpose of the audit exercise, which is to detect prejudice and discrimination; and (*ii*) holding other factors affecting the outcome constant may, for instance, exaggerate the race effect since the only differentiating factor among the tester-pairs is now race (see [34]).

Most measures of prejudice and discrimination, in particular old and new racial prejudices (that is, pre- and post-Civil Rights era racial prejudices), rely on surveys and interviews. However, through the use of laboratory procedures, empirical evidence can be documented that shows the influence of implicit primes on behaviors toward individuals that belong to non-choice groups even among persons that scored low on prejudice in surveys and interviews (see [34]). This may concur with Merton's (1949) assertion that "conformity with social norms can cause non-prejudiced persons to discriminate or prejudiced persons to refrain from discrimination".

## 3 Methodology

### 3.1 The Design

The experiment used the linear public good game context and was carried out in three waves at the University of Granada, Spain. The first wave was conducted in 2007 and the last two waves in 2011 with sample sizes of 48, 48 and 56, respectively.<sup>5</sup> Thus the experiment was run with 152 participants in total, who were selected from among first-year economics students at the university via public calls. The subjects were divided into groups of four each, and the game was played with the same partners in each group over five rounds. In addition to the first public good task, three other tasks were also included in the experiment as explained below.<sup>6</sup>

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<sup>4</sup>Automatic prejudice is conceptualized as a negative automatic association with a target group (see [40]).

<sup>5</sup>The two experimental waves conducted in 2011 were combined together as *wave 2011* data since there were no significant differences across the two.

<sup>6</sup>For details on Tasks 1 & 2 see Brañas-Garza and Espinosa (2011).

## Tasks 1 & 2

In Task 1, subject  $i$  makes decisions on how much to allocate between his or her private account, and a public account jointly held with the other subjects in his or her group. An endowment of 100 coins (of 2 euro cents each) is given to each subject at the beginning of each round. Contributions into the public account are expressed in a number of coins ranging from 0 to 100, i.e.  $c_{i,t} \in [0, 100]$ . Subject  $i$ 's total earnings here equal the sum of the payoffs obtained from the two accounts in the five rounds.<sup>7</sup> The private account benefit equals each subject's allocation into the account and is independent of the other subjects' decisions. In contrast, the public account benefit is a function of the sum of the allocations into the account by all four group members, which is multiplied by a constant factor 1.5 and where the product is shared equally among them at the end of the five rounds.

When the participants complete Task 1, the second task begins. This task requires subject  $i$  to make guesses (beliefs) about the mean contributions into the public account (in number of coins) of the entire group of participants (48, 48, 56 respectively for each wave) in the experiment for each of the five rounds ( $g_{i,t}$ ,  $t = 1, \dots, 5$ ). An incentive scheme contingent upon errors,  $e_{i,t} = g_{i,t} - \bar{c}_t$  (where  $\bar{c}_t$  is the observed mean contribution for each round  $t$ ) is then used as stated below:

- if  $|e_{i,t}| > 10$ , subject  $i$  receives 0 euros;
- if  $5 < |e_{i,t}| \leq 10$ , subject  $i$  receives 1 euro;
- if  $0 < |e_{i,t}| \leq 5$ , subject  $i$  receives 2 euros; and
- if  $e_{i,t} = 0$ , subject  $i$  receives 20 euros.

Subject  $i$ 's payoff in this second task is determined by using only one of the five rounds selected at random.

On completion of this task, subjects are instructed on how to compute the "Mean of the Mean Contributions (*MMC*)", that is, the mean of these mean contributions ( $\bar{c}_t$ ) which is the sum of the observed mean contributions for each round over the five rounds divided by T:  $MMC = \sum_{t=1}^5 \bar{c}_t / 5$ .

## Tasks 3 & 4

Task 3 requires subject  $i$  to make guesses about the *MMC* for each of the four foreign population groups (*African, Asian, Latin American & Westerner*). The basis of this task is that some experiments similar to this one took place in other parts of the world. Thus, for the four foreign groups under study, the real *MMC* data used in computing the payoffs in this task are sourced from previous studies (see Herrmann et al., 2008 and Cardenas and Carpenter, 2008). The

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<sup>7</sup>Private feedback on subject  $i$ 's payoff,  $\pi_{i,t}$  was given at the end of each period.

payment system and the benefit to each subject are the same as in the second task described above. In other words, the subjects' *MMC* guesses about the foreign groups are compared to the real values obtained from previous experiments performed with the four foreign groups. Subjects with small deviations from the real value get the prize (see previous subsection).

Finally in Task 4, subjects complete a set of questions which are designed to elicit information on the subjects' personal and family characteristics, and beliefs.<sup>8</sup> The English translation of the questionnaire is shown in the Appendix. The complete experiment lasted about an hour with subjects earning 13.47 euros on average.

### 3.2 Data

The research employs two types of data: *(i)* experimental data; and *(ii)* survey data, which comprises data on personal and family characteristics, and beliefs. The variables used are listed in Table 1 and explained below in four categories as experimental variables, personal characteristics, family characteristics and beliefs.

Firstly, for the experimental variables *average contribution* is calculated as the average of actual contributions made by the subjects in the five rounds, i.e. it takes values between 0 (no contribution) and 100 (max contribution). The variable *guess for locals* is obtained in Task 2 and is calculated as the average of the guesses of the contributions made in the five rounds of the experiment. The four variables, *guess for the  $j$ th-foreign group*, where  $j \in [African, Asian, Latin American \& Westerner]$  are obtained in Task 3. Identically to the contributions in Task 1, the five *guess* variables assume values ranging from 0 to 100.

**Table 1: COLLECTED VARIABLES**

Experiment	Survey		
	Personal Char.	Family Char.	Beliefs
average contribution	female	parental education	income status
guess for locals	foreign exposure	household chore	cultural status
guess for Africans	sport exposure	household culture	religious intensity
guess for Asians	political belief		societal cooperation
guess for Latin Americans			
guess for Westerners			

Secondly, for the personal characteristics gender is captured by the variable *female*. *Foreign exposure* is a measure of the number of foreign trips previously taken by the subject and takes the value 0 if the number of country-trips is lower than 3, and the value 1 otherwise. *Sport exposure* is a measure of the number of expensive sporting activities engaged in by the subjects and takes the value 1 if

<sup>8</sup>The evidence on whether belief elicitation may affect contributions is mixed (see Gächter and Renner, 2006). Here, belief elicitation was done ex-post.

the subject plays at least one expensive sport, and the value 0 otherwise.<sup>9</sup> The last two variables are used as proxies for the wealth or net worth of the subjects. The last personal characteristic is *political belief*; a variable whose values range from  $-3$  (least conservative) to  $+3$  (most conservative).

Thirdly, for the family characteristics *parental education* is a measure of the joint educational status of both parents and is computed as the product of the father’s and the mother’s educational levels – variables whose values range from 1 (basic education) to 4 (highest education). Thus, *parental education*  $\in [1, 16]$ .<sup>10</sup> *Household chore* is a measure of the allocation of household duties among family members and takes negative values if chores are borne by the mother alone, and positive values if chores are shared by all, with the values ranging from  $-3$  (most poorly divided) to  $+3$  (equally divided). This variable helps us to know if a subject’s family is of the “traditional or modern” type. *Household culture* is a measure of the schedule of cultural activities among family members and takes negative values if they only engage in indoor activities and positive values if they also engage in “high” cultural activities (theatre, cinema, etc.), with these values ranging from  $-3$  (least household cultural activities) to  $+3$  (highest household cultural activities).

Finally, for the belief variables *income status* is a measure of subject  $i$ ’s belief about the per capita income status of each foreign group. We recode the original variable so that it takes the value 0 for Spain as a reference point. This variable takes values ranging from  $-100$  (least per capita income status) to  $+\infty$  (highest per capita income status). In a similar vein, the two variables *cultural status* and *religious intensity*, which are measures of beliefs about the cultural standard and religious activism of each foreign group, also assume values ranging from  $-100$  (least cultural status/least religious intensity) to  $+\infty$  (highest cultural status/highest religious intensity). *Societal cooperation* measures subject  $i$ ’s belief about the within-group cooperative attitude of each foreign group and takes values from  $-3$  (least societal cooperation) to  $+3$  (highest societal cooperation).<sup>11</sup>

### 3.3 Prejudice Indices

Based on the variables obtained directly from the experiment, we define four more indices: prejudice toward each of the four foreign groups. First we compute the difference between the guess for the respective  $j$ -th foreign group minus the average (real) contribution by this foreign group as

$$Deviation(j\text{-th group}) = Guess(j\text{-th group}) - Contribution(j\text{-th group}),$$

<sup>9</sup>*Expensive Sport*  $\in$  [Golf, Paddle Tennis, Rugby, Skiing, Surfing, and Tennis].

<sup>10</sup>The choice of *parental education*—the combined educational status of both parents—as a variable and its subsequent specification as a multiplicative model is due to the enhanced robustness of its results relative to those from specifications using an individual model—separate educational status for each parent—and an additive model.

<sup>11</sup>Other variables are excluded (see Appendix 6.1).



where  $j \in [African, Asian, Latin American \& Westerner]$ . Contributions for  $j$ -th group, that is [Africans, Asians, Latin Americans and Westerners] are [51.75, 24.89, 48.75, 20.30] respectively.

Second, we repeat the same computation for predictions about participants' behavior, that is, the guess for locals minus the average contribution by locals in the current study (contributions for Locals, that is, [wave 2007, wave 2011] are [28.47, 38.55] respectively) as

$$Deviation(local\ group) = Guess(local\ group) - Contribution(local\ group).$$

We compute *prejudices* as

$$Prejudice(j\text{-th}\ group) = Deviation(jth\ group) - Deviation(local\ group)$$

where  $j \in [African, Asian, Latin American, Westerner]$ . Accordingly, we are able to compute four indices. These indices take values from  $-200$  (highest downside prejudice) to  $+200$  (highest upside prejudice). Thus, they capture subject  $i$ 's feelings toward each of the four foreign groups from a two-sided perspective, that is, from the left-side negative feelings to the right-side positive feelings. The utility of this approach to eliciting prejudice beliefs lies in its ability to capture subject  $i$ 's racial feelings in an unobtrusive manner.

### 3.4 Analysis

The data is analyzed through two platforms: (i) *Aggregate Behavior*, using summary statistics and hypothesis testing; and (ii) *Individual Behavior*, using regressions. For the hypothesis testing, the mean values and their significance levels are shown in section 4. The null hypothesis in each of these tests is:

$$H_0 : \text{mean of prejudice for } j\text{th foreign group } (\mu_p^j) = 0,$$

Finally, to analyze the determinants of individual behavior, quantile regression is used to fit the models of prejudice for all the foreign groups (except for the African model which uses the least squares approach) due to its robustness in response to large outliers which are observed in the data. Quantile regression is gradually emerging as a unified statistical methodology for estimating models of conditional quantile functions<sup>12</sup> and offers a more comprehensive strategy than the least squares estimators for completing the regression picture (see Koenker, 2005).<sup>13</sup> Discrete choice models are also fitted in Table 5 as checks.

## 4 Results

This section presents the results in two formats: aggregate and individual behaviors as stated below.

<sup>12</sup>Quantiles can be used to characterize a distribution (e.g. median, inter-quartile range, inter-decile range, symmetry and tail weight).

<sup>13</sup>The least squares method provides a general approach to estimating conditional mean functions. Its appeal stems from its computational tractability and the Gaussian distribution assumption for the observational noise, often an ex-post rationalization (see Koenker, 2005).

## 4.1 Aggregate Behavior

The summary statistics for all the variables of interest using the parameters' mean, standard deviation, minimum and maximum values are shown in Table 2 (excluding belief variables) and Table 3 (including only belief variables).

Firstly, in Table 2 regarding the prejudice indices: in the context of public goods contributions, *prejudices toward Africans* and *Latin Americans* have negative but significant (1% level) mean values, that is,  $-11.4$  and  $-14.3$ , respectively, thus indicating that, on average, subjects view Africans and Latin Americans as being less cooperative than they really are. In contrast, *prejudices toward Asians and Westerners* have positive but significant (1% level) mean values, that is,  $2.7$  and  $15.0$  respectively, indicating that, on average, subjects perceive Asians and Westerners as being more cooperative than they really are.

**Table 2: DESCRIPTIVE STATISTICS (EXCLUDED BELIEFS)**

	Mean	Std. Dev.	Min.	Max.
a) Prejudice Indices				
prej. toward Africans	$-11.4^c$	25.8	$-70.2$	56.6
prej. toward Asians	$2.7^c$	13.1	$-42.4$	33.9
prej. toward Lat. Amer.	$-14.3^c$	15.8	$-56.2$	38.1
prej. toward Westerners	$15.0^c$	12.2	$-14.8$	65.2
b) Exptal. Variables				
average contribution	35.36	20.7	0.0	100.0
guess for Locals	40.15	14.5	3.0	78.0
guess for Africans	45.11	24.4	0.0	100.0
guess for Asians	45.63	19.5	0.0	92.0
guess for Lat. Americans	39.25	16.1	2.0	90.0
guess for Westerners	40.12	16.6	3.0	90.0
c) Personal Char.				
female	0.45	0.5	0.0	1.0
foreign exposure	0.37	0.5	0.0	1.0
sport exposure	0.29	0.5	0.0	1.0
political belief	$-0.02$	1.2	$-3.0$	3.0
d) Family Char.				
parental education	5.29	5.7	1.0	16.0
household chore	0.00	1.6	$-3.0$	3.0
household culture	$-0.29$	1.3	$-3.0$	3.0

<sup>a</sup>=10% sig. level, <sup>b</sup>=5% sig. level, <sup>c</sup>=1% sig. level

Secondly, regarding the experimental variables, the mean values for *average contribution* and guesses for the five groups (locals inclusive) all fall below the focal (mid-point) point of 50, with those for the guesses being slightly higher, indicating that, on average, subjects' decisions tend to reflect their true feelings devoid of extraneous influences or noises.

Thirdly, regarding personal characteristics, *female*'s mean value of 0.45 indicates that experimental subjects are almost half female. *Foreign exposure*'s mean value of 0.37 indicates that, on average, subjects have low foreign exposure (that is, they have made less than three trips to foreign countries), while *sport exposure*'s mean value of 0.29 indicates that, on average, subjects hardly engage in expensive sporting activities. *Political belief*'s mean value of  $-0.02$  indicates that, on average, subjects are slightly left of the center.

Finally, regarding family characteristics, *parental education* has a mean value of 5.3. This indicates that, on average, the educational status of subjects' parents hovers around the medium-educational level (bachelor's degree). *Household chore*'s mean value of 0.0 indicates that, on average, household chores in the subjects' families is unequally shared by the members, that is, the families are mostly traditional. *Household culture*'s mean value of  $-0.29$  indicates that, on average, the schedule of cultural activities in the subjects' families tends toward "low cultural" outdoor activities.

In Table 3, the summary statistics for the four belief variables about *income status*, *cultural status*, *religious intensity* and *societal cooperation* are reported and explained as follows for the four foreign groups (Africans, Asians, Latin Americans and Westerners): the respective mean values for *income status* [26.9, 76.1, 63.9, 122.2] are indicators that, on average, subjects perceive Africans as the poorest, Asians as richer than the Latin Americans, and Westerners as the richest.

**Table 3:** DESCRIPTIVE STATISTICS (BELIEF VARIABLES)

	Mean	Std. Dev.	Min.	Max.
a) Income Status				
Africans	26.9	19.4	0	80
Asians	76.1	42.4	10	230
Latin Americans	63.9	29.2	15	200
Westerners	122.2	37.8	20	300
b) Cultural Status				
Africans	42.9	40.6	0	200
Asians	81.3	43.1	0	200
Latin Americans	81.6	42.0	0	250
Westerners	115.6	40.6	20	300
c) Religious Intensity				
Africans	132.3	53.1	5	300
Asians	107.5	48.7	0	200
Latin Americans	115.9	41.6	20	300
Westerners	90.3	28.6	15	190
d) Societal Cooperation				
Africans	1.3	1.4	-3	3
Asians	0.6	1.5	-3	3
Latin Americans	0.7	1.3	-3	3
Westerners	-0.1	1.4	-3	3

The respective means for *cultural status* [42.9, 81.3, 81.6, 115.6] indicate that, on average, subjects perceive Africans as having the poorest cultural heritage, Asians and Latin Americans as having their cultural heritages almost at a par, and Westerners as having the richest cultural heritage. The respective mean values for *religious intensity* [132.3, 107.5, 115.9, 90.3] are indicators that, on average, subjects perceive Africans as the most religiously active group, Asians as less religiously active than Latin Americans, and Westerners as the least religiously active.

Finally, the respective means for *societal cooperation* [1.3, 0.6, 0.7, -0.1] indicate that, on average, subjects perceive Africans as the most cooperative group, Asians as slightly less cooperative than Latin Americans, and Westerners as the least cooperative.

## 4.2 Individual Behavior

Tables 4 & 5 show the foreign prejudice models I & II of individual behavior<sup>14</sup> for the four foreign population groups with the discrete choice models in Table 5 used as checks. The results, however, indicate that racial prejudice does not have unique determinants across foreign groups and that the determining factors do not work in similar directions. In both tables, the influence of a predictor on each response variable increases, the higher its coefficient value in absolute terms, with the sign indicating the direction of this effect. That is, a positive sign indicates a direct influence on the response variable, while a negative sign connotes an inverse effect on the response variable.

In Table 4, a least square model is fitted for the Africans and Asians, while quantile regression models with  $q$  ( $= 0.5$ ) are fitted for the other two groups.<sup>15</sup> These quantile regression models estimate conditional median functions. Further tests of the robustness of the estimations are conducted using conditional quantile functions with  $q$  ( $= 0.25$  &  $0.75$ ), respectively, but the results are similar to the conditional median functions fitted in this paper. The dependent variables ( $\rho^j$ ) are *prejudices toward Africans* (column 1), *Asians* (column 2), *Latin Americans* (column 3) and *Westerners* (column 4). The independent variables are those mentioned in Table 1 as *average contribution*, personal and family characteristics, and beliefs.

Firstly, regarding the experimental variable, *average contribution* is a mixed and non-significant predictor of racial prejudices. However, in version B of the model (that is, model I-B which includes belief variables), the sign effects remain mixed but the regressor becomes significant at 1% for Asians as it attracts negative feelings toward them – an indicator that contribution to public good matters in a subject’s racial inclinations toward Asians only.

Secondly, regarding personal characteristics, *female* is a significant positive

<sup>14</sup>The two prejudice models I & II (in Tables 4 & 5, respectively) have two versions A & B. While version A is a partial model (as it excludes belief variables), version B is a full model.

<sup>15</sup>Shapiro-Wilk Tests for normality of the four prejudice distributions show that only prejudices toward Africans and Asians are normal. While prejudices toward Latin Americans and Westerners are both non-normal.

predictor of prejudice toward Asians only, elsewhere it is insignificant thus indicating that the sex of a subject is material in racial preferences toward Asians only. *Foreign exposure* exerts positive and significant influences on prejudices toward Africans and Latin Americans, but is insignificant elsewhere, suggesting that foreign trips enhance appreciation of racial diversities among subjects. In model I–B, the effects remain the same except that the regressor loses its significance for Latin Americans. *Sport exposure* exerts negative and significant effects on prejudice toward Latin Americans, and mostly negative and insignificant effects elsewhere. However, in model I–B the regressor acquires significance for Africans, while losing it for Latin Americans – an indicator that wealth status tends to impact negatively on racial affinity. *Political belief* is a significant negative predictor of prejudice toward Latin Americans, but is mixed and insignificant elsewhere – a surprising result.

**Table 4:** FOREIGNERS’ PREJUDICE MODEL I

Dep. var. ( $\rho^j$ ) = [Guess (jth) - Contribution (jth)] - [Guess (local) - Contribution (local)]								
	Model 1A				Model 1B			
	Afr. OLS	Asn. OLS	Lat. QR	Wes. QR	Afr. OLS	Asn. OLS	Lat. QR	Wes. QR
a) Exp. Var.								
average contribution	-0.02	-0.21	0.01	-0.06	0.001	-0.20 <sup>a</sup>	-0.02	-0.05
b) Pers. Char.								
female	0.60	3.77 <sup>a</sup>	0.23	-0.43	-0.57	4.74 <sup>b</sup>	0.29	-0.18
foreign exposure	9.77 <sup>a</sup>	2.32	4.51 <sup>b</sup>	-1.54	9.61 <sup>a</sup>	2.78	3.47	-0.74
sport exposure	-8.14	-3.11	-6.09 <sup>c</sup>	-2.72	-9.13 <sup>a</sup>	-2.53	-5.68	-2.94
political belief	0.56	-0.09	-1.21 <sup>a</sup>	-0.27	0.04	-0.46	-0.57	0.22
c) Fam. Char.								
parental education	-0.34	0.31	0.28 <sup>a</sup>	-0.14	-0.40	0.22	0.24	-0.18
household chore	-0.90	0.85	0.04	0.18	-0.71	0.77	0.54	0.18
household culture	2.34	-0.34	-0.69	0.85	2.55	-0.47	-0.22	0.66
d) Beliefs								
income status	-	-	-	-	-0.09	-0.04	-0.001	-0.05 <sup>a</sup>
cultural status	-	-	-	-	0.003	0.02	0.05	0.01
religious intensity	-	-	-	-	0.07 <sup>a</sup>	-0.003	-0.06	-0.01
societal cooperation	-	-	-	-	4.46 <sup>c</sup>	1.42 <sup>a</sup>	1.94	0.56
constant	-4.79	7.16 <sup>c</sup>	-14.58 <sup>c</sup>	21.59 <sup>c</sup>	-17.76 <sup>b</sup>	7.71 <sup>a</sup>	-9.97	26.77 <sup>c</sup>

<sup>a</sup>=10% sig. level, <sup>b</sup>=5% sig. level, <sup>c</sup>=1% sig. level; Dummy variable = wave 2007 (not reported)

Thirdly, with respect to family characteristics, *parental education* is a significant positive predictor of prejudice toward Latin Americans, and a mixed but insignificant predictor elsewhere; an indicator that the predictor can exert dual influences on racial preferences. In model I–B, this significance is lost for Latin Americans. *Household chore* exerts mixed but insignificant effects across all racial groups, suggesting that belonging to traditional or modern family does

not matter in a subject’s racial preferences. In model I–B, the effects remain the same for all racial groups. Also, *household culture* with its mixed influences has no significance in any of the foreign prejudice models, indicating that household cultural activities are immaterial to a subject’s racial inclinations. In model I–B, the effects remain mixed and insignificant.

Finally, regarding the belief variables, *income status* exerts negative but significant effects on racial prejudices toward Westerners, and is insignificant elsewhere, indicating that perceptions about per capita wealth of a foreign group impacts negatively on racial preferences toward Westerners only. *Cultural status* exercises positive but insignificant effects in all models; an indicator that perceptions about the cultural heritage of foreigners is immaterial in racial preferences. *Religious intensity* exerts positive but significant influences on prejudices toward Africans, and a negative and insignificant predictor elsewhere, suggesting that perceptions about religious activism matter in racial preferences toward Africans only. *Societal cooperation* is a significant positive predictor of racial prejudices toward Africans and Asians, and positive but insignificant elsewhere; an indicator that perceptions about within-group cooperation among foreigners impact positively on racial views.

### 4.3 Negative prejudice

To further explore the determinants of negative prejudices toward foreigners, we run new logit models<sup>16</sup> as shown in Table 5 where the dependent variables are *negative prejudices* toward the  $j$ th-foreign group ( $\rho_j^j$ ).

These models are fitted and depicted as prejudice model II. The models have two versions A & B which are fitted following a similar approach used previously in Table 4. The values for the four dependent variables are obtained by recoding the values of the prejudice indices (in section 3.3 page 8) into binary outcomes such that negative prejudice toward the  $j$ th-foreign group (where  $j$  is defined as earlier) assumes value (= 1) if the prejudice index is less than 0, and assumes value (= 0) otherwise. In essence, our consideration here is one-sided and is limited to examining the predictors of negative prejudices.

Firstly, regarding the experimental variable, *average contribution* is negative and a significant predictor of negative racial prejudices toward Asians, and is insignificant elsewhere; an indicator that the contribution to public good matters in a subject’s racial inclinations to Asians only.

Secondly, as regards personal characteristics, *female* is an insignificant predictor of negative racial prejudices (except in Asian model II–B where it is negative and significant), thus indicating that a subject’s sex is inconsequential to his or her racial preferences. *Foreign exposure* captured by trips to three or more countries is negative and a significant predictor of negative prejudices toward Africans, but is insignificant elsewhere, suggesting that the predictor is only material in racial inclinations toward the Africans. *Sport exposure*, which

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<sup>16</sup>The distributions of the four negative prejudice variables are statistically normal for Africans and non-normal elsewhere.

is captured by engagement in expensive sporting activities, is positive and a significant predictor of negative prejudices toward Asians, and is insignificant on other response variables, thus indicating that this predictor exerts influences on negative racial prejudices on Asians only. *Political belief* is also a mixed but insignificant predictor of negative racial prejudices, an indicator that political belief is inconsequential in racial preferences.

**Table 5:** FOREIGNERS PREJUDICE MODEL II

Dependent variable ( $\rho_{-}^j$ ) = Negative Prejudice for jth-group								
	Model 2A				Model 2B			
	Afr. probit	Asn. logit	Lat. logit	Wes. logit	Afr. probit	Asn. logit	Lat. logit	Wes. logit
a) Expt. Var.								
average contribution	-0.001	-0.03 <sup>a</sup>	-0.01	-0.002	-0.002	-0.04 <sup>b</sup>	-0.002	-0.004
b) Pers. Char.								
female	-0.15	-0.64	0.06	0.37	-0.22	-1.08 <sup>a</sup>	0.25	0.58
foreign exposure	-0.54 <sup>a</sup>	-0.23	-0.37	-0.02	-0.55 <sup>a</sup>	-0.29	-0.63	0.01
sport exposure	0.42	1.16 <sup>a</sup>	0.27	0.59	0.39	1.05	0.64	0.72
political belief	0.01	-0.12	0.26	0.36	0.08	-0.22	0.17	0.43
c) Fam. Char.								
parental education	0.01	-0.05	-0.05	-0.02	0.02	-0.07 <sup>a</sup>	-0.03	-0.01
household chore	0.12	-0.36 <sup>a</sup>	0.06	0.19	0.12	-0.40	-0.05	0.17
household culture	-0.14	-0.18	0.06	0.01	-0.13	-0.13	0.01	0.07
d) Beliefs								
income status	-	-	-	-	0.02 <sup>b</sup>	-0.01	0.01	-0.001
cultural status	-	-	-	-	-0.003	-0.01	-0.001	-0.01
religious intensity	-	-	-	-	-0.004	-0.02 <sup>b</sup>	0.02 <sup>b</sup>	0.01
societal cooperation	-	-	-	-	-0.13	-0.35 <sup>a</sup>	-0.59 <sup>b</sup>	-0.20
constant	0.25	-1.21 <sup>a</sup>	2.05 <sup>c</sup>	-2.75 <sup>c</sup>	0.65	2.53 <sup>a</sup>	0.43	-2.41

<sup>a</sup>=10% sig. level, <sup>b</sup>=5% sig. level <sup>c</sup>=1% sig. level; Dummy variable =, wave 2007(not reported)

Thirdly, with respect to family characteristics, *parental education* is a mixed but insignificant predictor of negative racial prejudices. However, in model II–B the effects remain the same save its acquired significance for the Asians; an indicator that the predictor can exercise dual influences on negative prejudices. *Household chore* is a significant negative predictor of negative prejudices toward Asians, and is positive and insignificant elsewhere; an indicator the predictor enhances warm glow to Asians only. While, *household culture* is an insignificant predictor of negative racial preferences though with mixed sign effects.

Finally, with respect to personal beliefs, *income status* is a significant positive predictor in the African model, and mixed and insignificant elsewhere, indicating that beliefs about per capita income status is only consequential in racial preferences toward the Africans. *Cultural status* is also insignificant on all the response variables; an indicator of the predictor’s inconsequential influence

on negative racial inclinations. *Religious intensity* is a mixed and significant predictor of racial prejudices in Asian and Latin American models, suggesting that beliefs about foreigners' religious activism have dual effects on negative racial perceptions. In contrast, *societal cooperation* is a significant negative predictor of negative racial prejudices in the Asian and Latin American models; an indicator that perceptions about within-group cooperation among members of a foreign group matter in negative racial preferences.

## 5 Discussion

Inherent in human nature is the capacity for erroneous generalization and prejudgment, which Allport (1954/1988) suggested is due to the mind's limited ability to process information. Consequently, the mind resorts to categorizing stimuli in accordance with the "least-effort principle" such that the constituents in each of these categories typifies an oversimplification of the real world (see [27]).<sup>17</sup> The existence in our results of prejudices toward foreigners whose category-based (foreign group) expectations are all significant, lends credence to Allport's assertion. The positive or negative sign associated with prejudice toward a foreign group might not be unconnected with the subjects' perceptions of how close or distant a foreign group's characteristics are to their own local group (in-group), respectively.

Within the purview of prejudice research focusing on people, this study circumvents limitations that might result from one-sided research that focuses on either the perpetrators or the victims of racial prejudices by using subjects that are oblivious of its real objectives, and can also potentially assume memberships in either of the two groups. These unique characteristics enhance the credibility of our results. In a similar vein, the public good contribution context also captures a non-competitive environment that is able to reveal subject *i*'s altruistic self via his or her contribution decisions; but more importantly for this study, it is able to decipher the subjects' racial beliefs unobtrusively via their guesses about others' contributions. Furthermore, from the behavioral economics perspective, this study explores the multiple causation paradigm suggested by many prejudice researchers to unravel the determinants of implicit racial prejudices among college students by using a set of predictors that highlight salient attributes of each subject, namely the experimental context, personal and family characteristics, and individual beliefs.

Our findings about the influences of these determinants on racial prejudices are discussed below.

Firstly, regarding experimental variable, the contrasting effects of *average contribution* on racial preferences toward Asians in the two models and its insignificant effects on prejudices toward other racial groups are unexpected and

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<sup>17</sup>The "principle of least effort" is a broad theory that covers diverse fields from evolutionary biology to webpage design. It postulates that animals, people, and even well-designed machines will naturally choose the path of least resistance or effort (<http://en.wikipedia.org>).



really surprising, given that the literature suggests that individual behavioral value orientation influences individual expectations about other's behavior.

Secondly, regarding personal characteristics, the significance of individual wealth proxied by *foreign exposure* and *sport exposure* are expected, independently of the divergent effects of the two proxies and their non-uniqueness as prejudice determinants across all the groups. These can be explained as follows. *Foreign exposure* broadens knowledge and appreciation of both human diversities and similarities, and this is supported by our results where its effects are significant and also attract warm glows to Africans and Latin Americans. These effects are, however, mitigated by the predictor's loss of significance for the latter group in model II. In contrast, *sport exposure*, which is captured by engagement in expensive sporting activities, is a value expression that manifests an ego or status symbol, and with the likelihood that individuals or groups not sharing this value are perceived to be anachronistic. This is supported by our results where its effects are significant and also enhance negative feelings toward Africans and Latin Americans. These effects contrast with those in model II due to the predictor's non-significance, but is however supported by its acquired significance on Asians. Also, the negative effect of *political belief* on prejudice toward Latin Americans is not unexpected as it might reflect ripples from past historical linkages on conservatives. However, these effects are mitigated on the Latin Americans in model II due to the predictor's loss of significance.

Thirdly, regarding family characteristics, our expectation is that given the importance of socialization on individual attitude formation as described in the literature, the trio of *parental education*, *household chore* and *household culture* should significantly impact on racial prejudices. In the case of *parental education*, the combined though contrasting results in both models support this view as the predictor's influences are mixed and significant with the exception of Westerners. A logical explanation for this is that in their role as social models for their children, parents influence individual prejudice formation positively or negatively through their own behaviors (which often capture their inherent values, nuances and sentiments), and not necessarily through pre-determined parental indoctrinations.

Finally, with regards to beliefs, the *income status* results of mixed effects and significance on racial prejudices from the combined results in both models are not unexpected – increased perceptions of affluence lead to resentment toward Africans and Westerners. For the former these are likely due to a gloomy view of Africans as poverty-stricken, while for the latter these are likely due to a splendid view of Westerners as wealthy. The warm glows exhibited by *religious intensity* and its significant impact on racial prejudices (save its contrasting effect on Latin Americans in model II) is not unexpected; a plausible explanation being that the Christian religious background of the Spanish subjects might be responsible. *Societal cooperation* exhibits the expected significance and warm glows on racial prejudices; a plausible explanation being that self-respect within a foreign group positively impacts on how outsiders view individuals within that group.

## 6 Conclusion

This paper offers two related issues: (i) an application of beliefs about the cooperative behavior of others to policy-oriented issues; and (ii) a method for exploring racial prejudices where the subjects are oblivious of its purpose. We test the hypothesis that there is no racial prejudice among college students, and examine the causal factors of racial prejudices among college students. In general, the results show that, on average, subjects harbor mixed feelings toward foreigners, specifically negative feelings toward Africans and Latin Americans, and warm glows toward Asians and Westerners.

The fitted models show that racial prejudices do not have unique determinants across foreign groups nor do the effects of observed determining factors work in similar directions. For instance, individual wealth whose proxies are *foreign exposure* and engagement in *expensive sporting activities*, exhibits mixed influences on racial prejudices as *foreign exposure* enhances warm glows toward Africans and Latin Americans, while engagement in *expensive sporting activities* tends to cause negative feelings toward Africans and Latin Americans – a trend which tends to diminish due to the predictor’s non-significance in model II.

An investigation of the invariance of prejudice distribution over time may perhaps be of research interest. In other words, how would personal growth stages in terms of aging, career advancement etc. impact on individual racial beliefs? Further, a similar study of prejudice that fits a three-regime switching model for the three states of negative-, zero-, and positive-prejudice may provide a basis for comparison with the quantile regression models fitted in this paper. Moreover, a role reversal for the subjects may also be of theoretical interest, that is, investigating how subjects will behave or react to others’ racial beliefs (e.g. by the four foreign population groups) about them.

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