Southern Africa Labour and Development Research Unit

Accents, Race and Discrimination: Evidence from a Trust Game

by

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Working Paper Series
Number 158

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This paper is dedicated to the memory of Dr. Neville Alexander, who devoted his lifetime to advocate mother-tongue based multilingualism in South Africa. We are especially grateful to Justine Burns for helpful guidance and advice. We also thank seminar participants of the Research Unit in Behavioural and Neuroeconomics (Ruben) and the Southern Africa Labour and Development Research Unit (Saldru). Funding of this research is gratefully acknowledged from the National Research Foundation of South Africa.

Recommended citation
Yagman, E., Keswell, M. (2015). Accents, Race and Discrimination: Evidence from a Trust Game. A Southern Africa Labour and Development Research Unit Working Paper Number 158 Cape Town: SALDRU, University of Cape Town.

ISBN: 978-1-928281-19-1

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Accents, Race and Discrimination: Evidence from a Trust Game

Ece Yagman and Malcolm Keswell*

Abstract

We investigate discrimination according to accent and race on trust behaviour. Proposers were randomly paired with responders of the same/different race, and asked to play the trust game after looking at a photograph and hearing a 10 second audio clip of the responders reading a standardised script in English. This allows us to check for within and across-group favouritism in both race and accentedness. We find that accentedness is a statistically significant predictor of trust and is strongly non-linear in the race of the paired subjects for males but not for females. In the case of males, offers decrease by 11.3% if the responder has a mother-tongue English accent and does not share the same race as the proposer, but increases by about 6.6% if there is racial similarity. This effect is especially pronounced for Black males who are paired with other Black males: offers are 19.5% higher if responders have a mother-tongue English accent. By contrast, females in general seem less sensitive to the signal package. These large gender differences are not because men behave any more strategically than women.

Keywords: Experiments, Trust, Accents, Discrimination, Race

JEL Codes: C91, D03, J15

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1 Introduction

There is a vast literature connecting trust to discrimination. For instance, Fershtman and Gneezy (2001), focusing on ethnic discrimination, showed systematic mistrust towards men of Eastern origin in Israeli Jewish society. Similarly, Wilson and Eckel (2006) found that minority groups in the United States are trusted less in strategic settings, and Haile, Sadrieh and Verbon (2008), Simpson, McGrimmon and Irwin (2007), and Naef and Schupp (2009), all point to some evidence on higher rates of trust towards lighter-skinned individuals. Similarly, in post-apartheid South Africa, both Ashraf, Bohnet and Piankov (2006) and Burns (2012) found that Black subjects are trusted less compared to White subjects.

There is also a growing literature on the gender differences that emerge in social exchange settings. This is especially true of situations involving trust, which has been demonstrated under a number of variations of the original investment/trust game of Berg, Dickhaut and McCabe (1995), including settings involving repeated play. For example, Davis, Ivanov and Korenok (2015) show that for pairs of subjects who play a repeated game, each subject's gender plays a strong role in predicting cooperative outcomes and remains fairly stable across a variety of game contexts.[1]

Linguistic background can also play a decisive role in terms of discrimination. A classic example here is Fershtman, Gneezy and Verboven (2005) who ran a trust game in Belgium, where the linguistic segmentation between the Flemish and the Walloons is very pronounced. They found strong in-group biases according to the languages of the paired subjects. In this same spirit, Tanaka and Camerer (2015) show that a majority group with high status (Vietnamese) exhibits no disfavoritism towards a lower-status out-group (Khmer) and typical disfavoritism to a second out-group (Chinese). In this study, language and ethnicity obviously combine to signal status in some way. The contribution of our paper is part of this broader research agenda that looks at the causal role of ethnicity and language in contributing to group-favouritism (or parochialism, in the parlance of Bowles and Gintis (2004)). However instead of language, we focus on accent as a source of discrimination.[2]

Why accentedness? Without information on the background or reputation of others, individuals may use an array of cues, ranging from the most apparent to very subtle, to form impressions of others. In that regard, one's accentedness could serve as a signal of social status, and may therefore play a role in developing initial perceptions and shaping social biases. In contemporary South Africa – the site of our study – accentedness is much more closely tied to social class than in other countries, because of the sharp delineation of the schooling system, even today, along racial lines. At the same time, only ten percent of the population speaks English as their home language in South Africa, yet it remains the *lingua franca* in the post-apartheid period (SSA 2011).[3] Under the contemporary schooling system

[1] See also Eckel and Grossman (1996) for an earlier example and more recently Gong, Yan and Yang (2015), Kamas and Preston (2015), Etang, Fielding and Knowles (2011), Cadsby, Servtka and Song (2010), Greig (2010), Slonim and Guillen (2010), Croson and Gneezy (2009), Buchan, Croson and Solnick (2008), Castillo and Cross (2008), and Croson and Buchan (1999).

[2] In linguistics, the concept of accent is viewed along a continuum. Below we define the term more precisely, but throughout the paper, and with some abuse of the English vocabulary, we shall refer to an individual's "accentedness" in a two-person sequential game setting, where signalling the accent of the second mover is processed by the first mover in binary terms. In other words, while it might be true that there might be subtle variations in the accent of the second mover, we assume that the first mover will process the signal by making a binary judgement call along the lines of "does this person have a Black sounding accent" before making their decision.

[3] The official languages of South Africa are Afrikaans, English, IsiNdebele, IsiXhosa, IsiZulu, Sespedi, Sesotho, Setswana, SiSwati, Tshivenda and Xitsonga. The following languages are also mentioned in the constitution despite not being official languages: Khoi, Nama and San languages, sign language, Arabic, German, Greek, Gujarti, Hebrew, Hindi, Portuguese, Sanskrit, Tamil, Telegu and Urdu.

in South Africa, English is taught by a first-language English speaker in very few schools, and in the vast majority of schools where this is not the case, Black learners are in the minority. These facts generate a wide amount of variation in accentedness among learners that make it into tertiary education (the source our subject pool). Undoubtedly, Blacks whose mother tongue is English will most likely have attended schools with broader racial compositions and therefore will have had the opportunity to acquire a non-Black sounding accent (a concept we will define more precisely below). Since it is widely accepted that schools with a greater level of integration (or less integration but where Black learners are in the minority) will have been better resourced (Burns 2012), accentedness will almost surely signal something about social status.

This leads us to the central question of this paper: to what extent is race/ethnic discrimination non-linear in accent? Stated differently, is there any evidence to suggest that accents hinder or amplify the race effect, when it comes to trust? In order to answer this question, we set up a trust game incorporating visual and audial signals that the proposer receives from the responder before the proposer is allowed to make their decision.

In real world day to day interactions, visual and audial signals are packaged together because individuals see and hear each other simultaneously in many, perhaps most, strategic interactions. To control for this, we vary the race of pairs of subjects playing the trust game, and expose the proposers to a signal package before they make their choices. Player As (the proposers) were randomly paired with player Bs (the responders) of the same/different race, and asked to play the trust game after looking at a photograph and hearing a 10 second audio clip of their player B partners reading a standardised script in English.[4] The audio clip was designed to reveal the extent to which the player B subject spoke with a discernible Black sounding accent. This allows us to check for within and across group favouritism in both race and accentedness.

Another somewhat unique feature of our design is that there are no cross-gender pairings of the proposer and responder. Recently, Slonim and Guillen (2010) ran a variant of the trust game where in one treatment, subjects could select their partners and in another treatment partner allocation was randomly assigned. They found little evidence of discrimination without selection but significant discrimination with selection. Specifically, they found that subjects select and send more to partners of the *opposite* gender and argue that this behaviour evidences tastes and beliefs towards each gender's trustworthiness. However, it could be argued that the very act of selection is in fact a form of discrimination, so *ex ante* one would expect trust to be higher in the treatment where players get to select their partners, than when selection is disallowed. The fact that they found trust to be higher in the selection treatment *across* gender pairings therefore implies two things for our design. Firstly, pairings are random. If proposers select responders on the basis of latent characteristics (of both parties), it becomes impossible to disentangle the causal effect we are trying to isolate. Secondly, we disallow cross-gender pairings. We do this precisely because the results of Slonim and Guillen (2010) make it impossible to know if proposers would have selected responders of the opposite gender in the first place, or whether in the treatment where selection was disallowed, whether trust would have been higher in any event, had the "right" cross-gender match been achieved. Indeed, as the literature in social psychology has demonstrated, women are far more likely than men to benefit from positive discrimination.[5] One obvious example of why this might be the case is (perceived) attractiveness. Within gender pairings will

[4]For examples of the clips, see the accompanying supplemental material to the paper.

[5]See Slonim and Guillen (2010) and the studies they cite in footnote 7 of their paper.

partly ameliorate this potential confound. However, in addition to this, we admit the possibility that something like attractiveness could still pose a potential confound even with a within-gender design like ours. We therefore also control for a measure of attractiveness.

A final innovation of our paper concerns interpretation. Ultimately, in estimating our treatment effects this boils down to paying special attention to underlying distributional assumptions, which is especially important in our context since our response variable is bounded on the unit interval. To tackle this problem, we employ a variant of Beta Regression that generalises to responses on the closed unit interval, by employing a mixture of degenerate distributions to model the extreme values and the Beta distribution to model responses on the open unit interval. Choice data that is experimentally elicited often embodies some or other type of pile-up problem (from below, above or both) and it is often the case that the normality assumption poorly approximates the distribution of these data so researchers often resort to converting responses into fractional data. However this practice in and of itself does not resolve the distributional choice problem for the researcher and it is not obvious that employing the double-limit tobit estimator is the correct approach to adopt (which is our reading of the standard practice in the literature on testing social preferences). The main problem is that with bounded data, but especially fractional data, the conditional variance is a function of the mean and this problem is exacerbated with modal mass points at zero and one. The beta distribution has the attractive feature of being able to handle this problem in quite a flexible way and has recently been extended to contexts where modelling of the conditional mean is the object of analysis.(Ferrari and Cribari-Neto 2004, Simas, Barreto-Souza and Rocha 2010, Ospina and Ferrari 2012). We employ a variant of this new approach dubbed zero-one inflated beta regression.[6]

We find that accentedness is a statistically significant predictor of trust and is strongly non-linear in the race of the paired subjects for males: offers decrease by 11.3% if player Bs have a mother-tongue English accent and do not share the same race as Player A, but increases by about 6.6% if they do share the same race as Player A. This effect is especially pronounced for black males who are paired with other black males: Player A trusts Player B about 19.5% more if Player B has a mother-tongue English accent. By contrast, females in general seem less sensitive to the signal package. This finding accords with the spirit of Visser and Roelofs (2011) who find that women generally give less in a modified dictator game, and are also less sensitive to the price of giving. However our findings show further that women display strong out-group biases and are not responsive to the accentedness of the trustee, whereas men are much more sensitive to the signal package and show evidence of strong in-group favouritism. In particular, men discriminate on at least one more salient dimension (accent) than women do. For men, hearing an accent can change the direction of discrimination in trust (from negative to positive) if similarity is high in race and accentedness is low, whereas, on average a female Player A distrusts a female player Player B if they share the same race as they do, irrespective of their accent. In contrast to Buchan et al. (2008), we find that these results cannot be explained by the hypothesis that men view the interaction any more strategically than women do.

The rest of the paper is structured as follows: in section 2, we review the relevant evidence on accent discrimination (as distinct from language discrimination). Much of this literature stems from audit studies and the main objective here is to illustrate that the treatment we employ is likely to

[6]Compared to the double-limit Tobit model, this approach predicts well. While our focus is not on comparing results across the two approaches, our experimentation with both approaches (results available upon request) provide vastly different answers to the same questions, with the Tobit estimator substantially over-predicting outside the support of the dependent variable and producing marginal effects that do not lend themselves to straightforward interpretation.

be salient as an audial signal. Section 3 then outlines the key features of our design, and covers how we measure trust and accent, before describing the experimental setting. We give special attention in section 3.4 to how we measured other factors that might confound our visual-audial signal treatment. Section 4 then outlines our econometric approach, before moving on to discussing the results (section 5) and concluding in section 6.

2 Accent Discrimination

It is now widely accepted that the acquisition of a second language after a certain age in early childhood inevitably leads to speech that differs from that of native speakers, mainly because established knowledge of the sound system of the first language impacts the perception and production of the phonetic patterns of the second language (Flege, Munro and MacKay 1995, Long 1990, Oyama 1976, Scovel 1988, Tahta, Wood and Loewenthal 1981). The human ability to detect different accents after receiving an audial cue is strong, even for phonetically untrained listeners. For instance, Flege (1984) has shown in a perceptual study that phonetically untrained listeners are able to detect a foreign accent in tiny segments of speech as short as .03 seconds.

Along with being easily distinguishable by individuals, accents also serve the listeners as immediate signals for assessing the character and background of the speakers (Giles 1970, Giles 1973, Ryan, Hewstone and Giles 1984). For example, Purnell, Idsardi and Baugh (1999) demonstrate that a group of untrained listeners hearing a voice over the telephone could guess the race of speakers after hearing them say only the word "hello". These assessments play a key role in determining listeners' perceptions of, and actions towards, the speakers. In other words, our speech reveals information beyond the message communicated for the listeners and it can play a major role in shaping the assessment of the speakers.

Given the evidence that the way we sound can serve as a signal to the listeners, do accents constitute a further dimension over which stereotyping can occur? Giles (1970) Giles and Sassoon (1983) and Stewart, Ryan and Giles (1985) provide evidence that an accented speech influences the listener's assessment of the speaker's personality, social status, social attractiveness, competence, and social distance. This influence might in turn stimulate negative or positive stereotypes and instigate discriminatory behaviour. Similarly, Ryan, Gallois and Forbes (1983) argue that speech accents can stimulate stereotypes and prompt illegal and discriminatory behaviour against accented speakers. To the extent that accents can be used as costless observable cues, they may also lead to negative group stereotypes. For instance, a study of the housing market by Purnell et al. (1999) found that callers who use standard American English versus African American vernacular English received a significantly higher number of confirmed appointments to view apartments.

Brennan and Brennan (1981) and Lambert (1967) argue that an accent might be a trigger for a person to react negatively as a result of prejudices held against a particular group of people. For instance, a study conducted with 730 undergraduate students in the USA revealed that an unseen speaker with a prominent non-English accent is rated as less interesting, less convincing, and even less physically attractive than another unseen speaker with a native English accent (Raisler 1976). Similarly, Ryan, Carranza and Moffie (1977) showed a positive correlation between the degree of accentedness and ratings of negative assessments on status, solidarity, and speech characteristics.[7] There is also some

[7]The degree of accentedness in this study was measured by a group of undergraduate students evaluating taped readings of an English text by Spanish-English bilingual speakers. The degree of non-standardness of an accent was rated by employing a seven-point rating scale.

evidence that suggests that listeners adjudicate the credibility of statements made by accented speakers negatively. For example, Lev-Ari and Keysar (2010) found that individuals judged trivia statements such as "Ants don't sleep" as less true when spoken with a foreign accent rather than a native one.

While a high degree of accentedness may lead to more negative assessments, the opposite may hold true for "standard" accents. For instance, in the United States, it has been found that higher status ratings (i.e. intelligence, wealth, education, and success) are mostly given to speakers with native accents even by the listeners who are foreign and who speak with an accent (Abrams and Hogg 1987, Ryan and Carranza 1975, Ryan and Sebastian 1980). Similarly, according to the social-psychological concept of Accent Prestige Theory (APT), speakers in the United Kingdom who have an English accent that is categorised as "first-class", are generally granted better evaluations; not only on a competence dimension that centres on intelligence, education, social class, and success, but also on a solidarity dimension which entails friendliness, trustworthiness, and kindness (Giles 1970).

Positive and negative connotations associated with accents also appear socially entrenched in some societies to the point that a market that capitalises on negative accent stereotyping has emerged where companies offer internet-based courses that promise to alter a "foreign sounding" accent into an "American sounding" one. Blommaert (2009) analysed some of these courses and concluded that (1) the rush towards English is as a result of the global perception that English is the key to an upwardly mobile trajectory, and (2) the positive effect is even more prominent if the individuals sound American, so there is a strong incentive to sound more American as this is widely perceived as instrumental to success, especially by people who are socio-linguistically different.

A study from Sweden by Rödin and Özcan (2011), which investigates the influence of accented speech in the dominant language, also finds strong negative beliefs about performance for candidates who speak Swedish with a foreign accent. When both looks and speech were presented for performance evaluation, they found a strong negative effect of speaking Swedish with an accent. In fact, their results indicate that these ethnic stereotypes associated with speech override stereotypes that are caused by appearances.

In essence, these studies highlight that (1) Accents can be easily and quickly discerned, (2) accents can be used as signals that can shape perception and behaviour, (3) negative stereotypes and auditory redlining can be based on accents, and (4) these accent stereotypes can even overpower other kinds of profiling. Evidently, accents do matter in everyday life, especially in contexts where informational asymmetries are present.

3 Experimental Design

3.1 Eliciting Trust

We employ a standard trust/investment game (Berg et al. 1995) to elicit trust. In this decision making task, two individuals (most often strangers) need to make a snap decision to interact with each other in order to increase their individual and collective welfare. This experimental design more or less simulates a type of market exchange where asymmetric information and contractual incompleteness leads people to make strategic decisions on whether to trust a stranger or not.[8]

[8] Of course, the amount sent in the trust game could be confounded by altruism (Cox 2004), or could be explained by betrayal aversion (Bohnet, Greig, Herrmann and Zeckhauser 2008, Fehr 2009) or a range of other factors (Ben-Ner and Halldorsson 2010, Ermisch, Gambetta, Laurie, Siedler and Noah Uhrig 2009). We abstract from these specific issues

The interaction consists of two stages: during the first stage, both of the players are given the same endowment by the experimenter, after which Player A is asked whether he or she would like to send any of their money to Player B. Should player A choose to do so, the experimenter subsequently doubles the amount sent by Player A, and Player B receives this multiplied amount.[9] The second stage of the game involves Player B making a decision about transferring money back to Player A. Although the sub-game perfect equilibrium dictates that Player A should send zero, the socially optimal outcome requires Player A to transfer all of the initial endowment to Player B and for the latter to return 50% of the doubled amount. Of course, Player A would only make a transfer if he/she has an expectation of getting at least half of the doubled amount in return. As the name suggests, the amount that Player A sends is indicative of trusting behaviour that would maximise the overall pie, whilst the money Player B transfers back is considered as trustworthiness/reciprocity.

3.2 Measuring Accentedness

Broadly speaking, every regional variety of English has a sociolinguistic continuum from 'standard' (educated, non-stigmatised, favoured by the schools, normal for public discourse) to 'vernacular' (non-standard and stigmatised by at least some of the standard-speaking community) (Lass 2002). In South Africa, these variations in English are particularly manifested in distinct ethnic varieties (ethnolects), such as Black South African, along with the traditional British English spoken by White communities that is considered as the standard English (SAE) (Gough 1996). Black South African English (BSAE), which can be briefly defined as the variety of English commonly used by mother-tongue speakers of South Africa's indigenous African languages, is characterised by clearly separate and distinguishable sound systems (Hundleby 1964, Lanham 1967, Adendorff and Savini-Beck 1993, van Rooy 2000, Van Rooy and Van Huyssteen 2000).

The roots of BSAE lie in the history of institutionalised segregation where the apartheid government deprived black South Africans free access to English. The 1953 Bantu Education Act effectively separated black South African learners from the native English speaking community and the mother-tongue English speaking teachers in the system were slowly phased out (Lanham 1996). This limited contact with native-speaker norms and the deliberate under-provision of educational infrastructure gave rise to deviance from standard English, which, in time, became naturalised by the large numbers in successive generations (Wright 1996). In the post-apartheid South African context, the structural inequalities of the past do still play out: many black parents insist on English-medium instruction in former black primary schools; however, in reality most of the teachers in these schools are a product of the apartheid policy of "Bantu Education" (De Klerk and Gough 2002) and by dint of this fact are BSAE speakers themselves. This deficient use of English as a medium of instruction in schools bolsters the social divide between Blacks who speak BSAE and Blacks who have access to privileged education and thus can speak "standard" English (Silva 1997). Although race and home language are highly correlated, being a black South African is not synonymous with being a BSAE speaker. These different and predominantly ethnically marked varieties of English become salient on the basis of accent – a combination of phonetic details and phonological properties – eliciting the social status, educational level, and the

because our reading of the literature is that these factors seem highly contextually dependent. See also footnote 19.

[9] The original game by Berg et al. (1995) triples the money passed to the receiver. While many replications of the trust game across numerous countries kept the convention of tripling the amount sent by Player A, it is also common to find studies where the quantity sent is doubled to lower the cost of conducting the study. For further discussion on the effect of rate of return on trusting behaviour see (Coleman and Coleman 1994).

mother-tongue of the speakers (Lass 2002).

Our measure of whether Player B is a BSAE speaker is given by the variable *Mother Tongue is English*, which is a self-reported measure by the subject of whether or not they deem English to be their mother tongue. To check the salience of this measure, we also collected data from so called third-party evaluators (see section 3.4 for more details). These individuals, who were not players in the trust game, were asked to rate the extent of what they saw and heard in the signal package as being representative of someone whose mother tongue was likely to be English. Each responder in the trust game was rated in this way by 6 third-party evaluators. Out of this data we constructed another binary measure of accentedness: *Mother Tongue is English (3rd party)*. This measure turns out to be highly correlated with the self-reported measure.

3.3 Experimental Setting

The experiment was conducted with undergraduate students at the University of Cape Town (UCT) in two separate sessions between May and October 2012. The students were invited to participate in a "decision-making" study and told that they had an opportunity to earn extra cash based on the decisions they made during these tasks. Students, who were interested in being a part of the study, completed a short questionnaire designed to elicit demographic as well as linguistic background. This information was later used to create a binary self-report measure which indicates if the subjects identify themselves as a first language English speaker or not. Given that BSAE is defined as the variety of English commonly used by mother-tongue speakers of indigenous African languages, our way to measure this variable is to use the propensity to speak English as a mother-tongue. As mentioned before, while it is true that having an African mother-tongue is highly correlated with the variety of English spoken, socioeconomic status and privileged education are also significant contributors. In that regard, Black South Africans who speak an indigenous African language at home can still be regarded as first-language English speakers if they were able to master its linguistic and communicative aspects during the critical stages of language acquisition (cf. Johnson and Newport (1989) and Pokorn (2005)).

Prior to the experiment, the participants were invited to a pre-study session by the experimenter. The main purpose of these one-on-one sessions was to record the voice of each of the subjects whilst also probing questions about the linguistic background. This way, we could clarify the concept of first-language English and correct for any misreporting. In these sessions, each of the participants read the same standard script aloud and their voices were recorded by the same recording device.[10] In other words, all participants were asked to read grammatically correct English in order to diminish the effect of language proficiency while highlighting varying degrees of standardness. In addition to the voice clips, we also obtained subjects' permissions to retrieve their student identification photos from the university intranet. These photos were used to reveal the subjects' racial identities. The treatment package then constituted a 10 second voice clip alongside the photo of each participant. These clips were uploaded to an online video-sharing website called Vimeo, and a private link with a password was created for each participant clip.[11]

[10] While the script is contextually meaningful, it doesn't allow for any revelation of personal information.

[11] One of the biggest advantages of using an online video-sharing website is that it provides detailed statistics on how many times the videos get watched and if the viewers watch the entire clip. Since the links are designed to be private, only the students with the right link address and password could watch the clip that had been assigned to them. By using Vimeo, we could monitor the online procedure closely and check if the subjects followed the instructions properly – that is, if they saw the photo and heard the voice of their partners before making their decisions.

Once all the videos were uploaded to Vimeo, we divided the sample pool into two groups along two dimensions: race and first language. The gender of participants in a given pairing was held constant for possible confounding cross-gender effects that might arise. Following the pair-up process, Player A's received their decision tasks in their emails. The instructions stated that they were endowed with 50 South African Rand and they now had a chance to send any amount from this R50 to their partner, Player B.[12] They were also told that any amount that they decided to send would be doubled before passing it on to Player B. The decision could only take place after watching the video that allowed them to see and hear Player B, who was also endowed with R50. The instructions also provided a private link and password so that Player A's could gain access only to their partner's clip. A similar process was also followed for all Player B's, whereby they saw and heard their partners before making a decision on the amount they were going to send back, if any.

3.4 Measurement of confounding factors by 3rd Party evaluations

The treatment package that was used in the trust game includes a combination of self-reported variables on race and accent. While these are the main variables we use to measure the causal effect of accent on trust, we cannot rule out the possibility that subjects may be responding to a different set of attributes when they see a picture and hear a voice clip. There are several studies suggesting that physical appearance may affect how a person is perceived and treated by others. Of direct relevance for us are the findings of Wilson and Eckel (2006), who tested whether attractive subjects gain a "beauty premium" in strategic interactions. They found that attractive trustees are viewed as more trustworthy and are trusted at higher rates in the first stage of a two-stage trust game. There is also other evidence which lends credence to a potential attractiveness confound in our signal package. For instance, Mobius and Rosenblat (2006) found a positive relationship between attractiveness and beliefs about productivity while Biddle and Hamermesh (1995) showed a positive correlation between earnings and beauty.

In addition to attractiveness, we also include measures of Player Bs perceived trustworthiness and nationality as it is possible that player As make snap judgments along these dimensions in processing the signal package. While it is not clear to us what it means to say "this person *looks* trustworthy", it is not impossible that priors concerning certain types of attributes about a person's appearance could play a role in the formation of beliefs about trustworthiness, even in the absence of evidence about a person's actual trustworthiness. Similarly, when it comes to accent, it certainly is possible that people make snap judgements about country of origin after hearing an accent.

To obtain an objective assessment on personal attributes of the trust game participants, a new group of students (called "evaluators") were asked to rate each participant's picture and voice recording in a non-strategic setting. These evaluations include assessments of trustworthiness and linguistic background of the subjects. As the subjects participating in the trust game and evaluators are all undergraduate students at the same university and recruited the same way, how the subjects are perceived by the evaluators would be a good approximation of how they are perceived by their pairs in the trust game.

In order to incentivise the evaluators to offer honest assessments (instead of randomly ticking boxes), each evaluator was told that the experimenter already had data on the subjects for these attributes based on self-report measures from the survey interviews, experimental decisions and psychometric

[12] At the time of the experiment, R50 was equal to $9.52 using the 2012 World Bank PPP conversion factor. For more details see http://data.worldbank.org/indicator/PA.NUS.PRVT.PP/countries?display=default

testing. Evaluators only had to guess what these scores would be and the closer their assessment was to the data, the more money they would receive. Put simply, an evaluator's compensation was directly linked to how many correct answers they could get.

A total of 72 UCT students were recruited as picture and voice evaluators. The evaluators had not participated in the trust game and therefore had no interaction with the participants. Each of these evaluators received an assessment task that included an online private link which directed users to a playlist of videos. These videos contained the pictures and voice clips of 21-22 trust game participants who are randomly selected. The link also included a set of evaluation questions on a range of characteristics about these subjects. They were asked to make their best assessment on a host of attributes regarding the candidate they were assessing, including our main variables of interest. In particular, evaluators were asked to rate the candidates on characteristics such as trustworthiness, confidence, attractiveness and timidity, as well as on linguistic features, i.e.: speaking English as a first language, after they watched their clips. In total, there were 8 different attribute questions with a rating scale from 1 to 10 for each clip (10 being "very likely" to exhibit the trait, 1 being "very unlikely"). Assessments were then done by the evaluators who watched a set the clips and then answered the assessment questions. In order to make sure that the assessments were as objective as possible, we assigned 6 evaluators – 3 White and 3 Black – per voice clip. Similar to the trust game design, the gender of the evaluators and candidates in the clips was held constant. In total, we collected 1572 unique observations for these picture and voice evaluations.

4 Econometric Approach

4.1 Modeling fractional responses

In this section we turn our attention issues of estimation. Our data structure poses several challenges that requires a departure from the normal distribution. Figure 1 below shows the distributions of offers in the trust game as a fraction and also as a rand amount. There are two issues that we clearly need to contend with. Firstly, the dependant variable (in levels) is clearly truncated from below (at zero) and from above (at 50). Specifically, about 30% of the responses in our experiment fall into one of these extremes.

An obvious choice in this instance would a two-limit Tobit model. However as Figure 1 makes clear, in our case even for values of the dependant variable falling in (0,50), merely eyeballing the distribution suggests that the data is not normally distributed, so one would need to log-transform the data before applying the Tobit estimator. Of course this raises the issue of how to handle the zeros. A standard practice would be to make an arbitrary adjustment to the zeros thereby shifting the lower limit point to something slightly less than the smallest non-limit observation (see Cameron and Trivedi (2010) for an example) but this in effect compounds the problem.[13] An alternative approach would be to transform the dependant variable into a fraction and then run a Two-limit Tobit model. Since our dependent variable has a pile-up at both 0 and 1, a Two-limit Tobit model would seem logically consistent (since the limit points can be seen as corner solutions). However, even in this instance, as Wooldridge (2010)

[13]For example, with a mass point at zero and 50, what would result is a further mass-point at $\ln(0.99) = -0.01005034$ and $\ln(50) = 3.912023$. One option if one were wedded to the idea of a Two-limit Tobit, would be to apply an inverse hyperbolic sine transformation to the data. We indeed experimented with both of these options, but both approaches generated a non-trivial number of predictions lying outside the support of the dependant variable.

has pointed out, if one is interested in the effects on the conditional mean – as we are – the two-limit Tobit will generally produce inconsistent estimates of the conditional mean function.

Another approach, also suggested by Wooldridge (2010), would be to take a log-odds transform of the dependent variable. The idea here is that since a fraction is mathematically equivalent to a probability, one can view $y/(1-y)$ as an odds-ratio. Thus log-transforming this pseudo odds ratio will map the result back into the reals and then one can apply OLS. Again however, the problem lies with the fact that this quantity will be undefined for the limit observations.[14] A further concern is that even if $0 < y < 1$, interpretation is not straightforward.

Given the above considerations, there are two options. Firstly, one can employ what Wooldridge (2010) has called "fractional logit" (or probit). This approach is a straightforward extension of the binary logit or probit model but essentially the log-likehood function as applied to a Bernoulli distributed random variable will take on exactly the same structure for a fractional response and has the added benefit of mapping predictions into (0,1) (see Papke and Wooldridge (1996) for the details). The key limitation however is that the zeros and ones a not treated any differently. A further limitation is that one is forced to assume either the logistic or normal distribution for responses on $0 < y < 1$.

A further limitation is that even though the Bernoulli log-likelihood belongs to the linear exponential family, fractional logit or probit do not directly handle the fact that the conditional variance is a function of the mean. On the other hand, the beta distribution exhibits this attractive feature. In a series of papers Ferrari and Cribari-Neto (2004) and Simas et al. (2010) developed regression models for beta distributed random variables using a parameterization of the beta law that is indexed by the mean and dispersion parameters. Ospina and Ferrari (2012) extended this original framework to handle fractional responses involving limit mass points. This new approach, which they dub zero-or-one inflated beta regression forms the basis of our approach, albeit with some slight differences.[15]

4.2 Zero-One Inflated Beta Regression

We first outline the basic framework for the case where there are no mass points at 0 or 1. Our dependent variable is the fraction of the endowment offered by player A in the trust game. For the moment, let us restrict this response to $0 < y < 1$. As is well known, the beta distribution can take on a variety of shapes. Let a and b define these two shape parameters, with increases in a pulling the density toward zero and b pulling the density towards 1. Under the assumption that y follows a beta distribution, its density will be

$$f(y; a, b) = \frac{1}{\mathcal{B}(a, b)} y^{a-1}(1-y)^{b-1}, \qquad 0 < y < 1$$

and zero otherwise, where the normalizing factor $\mathcal{B}(a, b)$ can be written is terms of the gamma function

$$\mathcal{B}(a, b) = \frac{\Gamma(a)\Gamma(b)}{\Gamma(a+b)}$$

which then implies

[14] Applying OLS to the untransformed fractional data obviously will also not do the trick as the conditional expectation function will be clearly non-linear and the variance will decline as a function of the mean (as either limit point is approached).

[15] See also Kieschnick and McCullough (2003) for an early applications of this approach and more recently Cook, Kieschnick and McCullough (2008) for Beta regression in a self-selection framework.

$$f(y;a,b)=\frac{\Gamma(a+b)}{\Gamma(a)\Gamma(b)}y^{a-1}(1-y)^{b-1}, \qquad 0<y<1$$

It can then be shown that

$$\begin{aligned}\mathrm{E}(y) &= \frac{a}{a+b}\\ \mathrm{Var}(y) &= \frac{ab}{(a+b)^2(a+b+1)}\end{aligned}$$

The goal now is to define a regression model for this beta-distributed random variable y. Following Ferrari and Cribari-Neto (2004), we sketch the framework using a different parameterisation of the beta density. Since interest in a regression context centres on modelling the conditional mean, it makes sense to set

$$\begin{aligned}\mathrm{E}(y) &= \frac{a}{a+b}=\mu\\ \mathrm{Var}(y) &= \frac{\mathrm{Var}(\mu)}{1+\phi}\end{aligned}$$

where μ is a location parameter and $\phi = a+b$ is a "precision" parameter. Note that this definition now implies that $\mu\phi = a$, $(1-\mu)\phi = b$ and $\mathrm{Var}(\mu) = \mu(1-\mu)$. This therefore means that the density of y can now be written using this new parameterisation:

$$f(y;\mu,\phi)=\frac{\Gamma(\phi)}{\Gamma(\mu\phi)\Gamma((1-\mu)\phi)}y^{\mu\phi-1}(1-y)^{(1-\mu)\phi-1}, \qquad 0<y<1$$

where $0<\mu<1$ and $\phi>0$

This density is very flexible: it accommodates bell-shaped, left or right skewed as well as the uniform distribution (as is the case when $\mu = 1/2$ and $\phi = 2$). To use these distributional features in a regression context, it is standard to employ a GLM framework. Let $y_1 \ldots, y_n$ be independent random variables such that $y_i \sim \mathcal{B}(\mu, \phi)$, $i, \ldots, n$. We can then define the beta regression model as

$$g(\mu_i)=\mathbf{x}_i\boldsymbol{\beta}=\eta_i$$

where η is a linear predictor. In this formulation $g(\cdot)$ is a link function that maps the conditional mean into the reals. In our specifications, we choose a logit link function.[16] Up to this point, estimation would proceed more or less in the same way as does fractional regression, with the exception that instead of using the binomial distribution in setting up the likelihood function, we use the beta distribution, and we model the zeros and ones as discrete choices. Since we in fact are dealing with a choice problem, where the outcome is observed after an experimentally induced treatment, a discrete choice approach for the limit points makes more sense, as opposed to assuming that the zeros and ones result purely because of sampling variability.

In this unbounded context, estimation of μ and ϕ would proceed by maximum likelihood. Taking the log of the above likelihood function (suppressing subscripts for notational convenience) we have:

$$l(\mu,\theta)=\log\Gamma(\theta)-\log\Gamma(\theta\mu)-\log\Gamma((1-\mu)\theta)+(\mu\theta-1)y^{*}+(\theta-2)y^{\dagger}$$

[16] The link function is always necessary as we want to avoid predictions outside of the unit interval.

where, as already stated we are using the logit link function, so $y^* = \log[y/(1-y)]$ and $y^\dagger = \log(1-y)$ if $y \in (0,1)$ and $y^* = 0$ and $y^\dagger = 0$ otherwise.

Ospina and Ferrari (2012) showed that this model can be generalised to a context involving extreme values on the closed unit interval.[17] Their extension of the GLM framework to cover this case requires degenerate probability statements that produce a mixture density, which in turn effectively boils down to an additive term to the log-likehood function given above. Specifically, one can think of 3 possible cases: (a) the case of zero-inflation (which is the case covered by Ospina and Ferrari (2012)) where a new parameter is added to account for the probability of observing values at zero. This leads to the mixture density of the form:

$$f(y; p_0, \mu, \phi) = \begin{cases} p_0 & \text{if } y = 0 \\ (1-p_0)f(y;\mu,\phi) & \text{if } 0 < y < 1 \end{cases}$$

or, (b) the case of one-inflation (which is also a case covered by Ospina and Ferrari (2012)) where a new parameter is added to account for the probability of observing values at one. This leads to the mixture density of the form:

$$f(y; p_1, \mu, \phi) = \begin{cases} (1-p_1)f(y;\mu,\phi) & \text{if } 0 < y < 1 \\ p_1 & \text{if } y = 1 \end{cases}$$

or, (c) the case of zero-one inflated Beta Regression giving the following mixture density:

$$f(y; p_0, \mu, \phi) = \begin{cases} p_0 & \text{if } y = 0 \\ (1-p_0)(1-p_1 f(y;\mu,\phi) & \text{if } 0 < y < 1 \\ p_1 & \text{if } y = 1 \end{cases}$$

Although adding in both zero and one inflation complicates the likelihood function, this complication is merely additive (in the sense that two new terms are added to the likelihood function). As Ospina and Ferrari (2012) show, this estimator can be operationalised by separately fitting logit/probit regression for the binary outcomes p_0 and p_1 and then using the resulting predicted probabilities for $y = 0$ and $y = 1$ to construct the terms $(1-p_0)$ and $(1-p_1)$. The product of these terms is then used to "inflate" the Beta density.

5 Results

5.1 Descriptive Statistics

Table 1 shows the summary statistics on the key demographic characteristics and offers of the participants who took part in the experiment. The 262 students who participated in the experiment are on average 20 years old and the majority of them are South Africans. The average offer is R21.16 which amounts to 42% of the initial endowment. Out of the total 131 pairs, 57 of them are non co-ethnic (Black-White or White-Black) and 74 are co-ethnic (White-White or Black-Black) pairings. Table 2 shows that there are virtually no statistically significant differences between co-ethnic and non co-ethnic pairs.[18] So without conditioning on any other variables, there appears to be no in/out group differences.

[17] See their paper for further details regarding inference and diagnostics.

[18] It is interesting to note that the likelihood of co-ethnic pairs to know each other is 10% higher than non co-ethnic pairs.

However, our hypothesis is that the effect of co-ethnicity could be non-linear in accent. We now turn to investigating this hypothesis. In all the regressions that follow, our dependent variable y is the fraction of the endowment offered by Player A to Player B, after receiving a signal package.

5.2 Empirical Estimates

As already outlined, subjects responded to visual and audial cues which revealed race, gender and an indicator for whether or not Player B (the trustee) is a Black South African English (BSAE) speaker. Our measure of whether Player B is a BSAE speaker is given by the variable *Mother Tongue is English*, which we abbreviate to *MTE* in all of our regression tables. Furthermore, we do not control for risk preferences in any of our regressions.[19]

We report two different kinds of marginal effects. The first marginal effect, labelled AME, corresponds to the mixture model. These effects therefore take into account the mass points at zero and one. The second type of marginal effect, labelled, AMEno01, corresponds to the Beta regression estimated for responses that excludes the extreme values. It is instructive to compute these additional marginal effects to get a sense of the extent to which the extreme values matter for interpretation purposes. In general, we find that these magnitudes are about twice as large as the marginal effects for the mixture model. This suggests two things. Firstly, it illustrates the importance of correcting for the bounded nature of our response variable. Secondly, it evidences the need to employ a flexible enough distribution that is capable of correcting for the skewness evident in our data and better handling the heteroscedasticity that naturally arises in data bounded on the unit interval.

We begin by reporting our most basic specifications in Table 3. In these specifications, we do not control for the other ways in which audial and visual cues might have an impact. In the first set of regressions, there are no significant differences in the offers conditional on the gender, race, co-ethnicity, and mother-tongue English variables. The last two columns include an interaction term between co-ethnicity and mother-tongue English; in other words measuring the effect of Black-Black and White-White pairings where Player B's are mother-tongue English speakers. Here too the interaction effects are not statistically significant. However, in these specifications we ignore the possibility that the signal package might be endogenous due to omitted variables. However this assumption is quite strong. For instance, *MTE* could reflect other things as well as accent since the subjects saw a photograph and listened to a voice clip simultaneously. Since visual and audial cues are packaged together, it might be confounded with other effects. In addition to race, gender and accent, we hypothesise three additional factors that could also be perceived by Player A when processing the signal package: attractiveness, trustworthiness, and citizenship. In order to isolate the non-linearity between race and accent, we need

[19] Etang et al. (2011), Slonim and Guillen (2010), as well as Eckel and Wilson (2004) all find no relationship between trust and behavioural risk measures. This also turns out to be true of distrust. McEvily, Radzevick and Weber (2012) introduce a novel behavioural measure of (dis)trust, based on individuals' willingness to pay to avoid being vulnerable to the target of trust and find that risk aversion and altruism do not correlate highly with their measure of (dis)trust. Furthermore, Houser, Schunk and Winter (2010) show that while risk attitudes predict individual investment decisions in risk games, this does not hold true in trust games. Somewhat relatedly, Fetchenhauer and Dunning (2012) finds study subjects were significantly more willing to choose a risky option in a trust game than in a lottery task with identical probabilities. All of these recent findings present convergent evidence that trust decisions are not strongly (if at all) correlated with a person's risk attitudes. This might be because the standard elicitation method of Holt and Laury (2002) has very low test-retest reliability (Lonnqvist, Verkasalo, Walkowitz and Wichardt 2015). Either way, there is, at best, very weak evidence that a potential risk confound in the trust game plays an important role in undermining the interpretation that trusting behaviour is a stable individual characteristic. The Fetchenhauer and Dunning (2012) result in particular would suggest that if low offers in a trust game is explained by beliefs about trustworthiness of the responder, then it cannot be because the proposer is risk-*averse*.

to control for these other potential ways in which the signal package could be perceived.

The estimates presented in Table 4 controls for these potential confounding factors. Our measures of attractiveness, trustworthiness and citizenship are taken from third party evaluations of these attributes of the Player Bs.[20] When we control for these confounds, we see that neither *Coethnic-pair* (which is our measure of the race effect) nor *Player B is MTE* (our measure of BSAE), are individually statistically significant. However when we include the interaction term (shown in the last two columns in the table), it is clear that race and accent affect trust non-linearly. Column 3 of the table, which shows the average marginal effects of the mixture model, shows that offers decrease by about 6% if player Bs share the same race but do not have a mother tongue English accent. However, although not statistically significant, the inclusion of the interaction term suggests that offers *increase* by about 7% if Player Bs are mother tongue English speakers. This means that initially, the effect of co-ethnicity is negative (supporting the hypothesis of out-group bias). However, this result is reversed when co-ethnicity and mother-tongue English is interacted. In other words, a mother-tongue English accent has some advantage to negate the out-group bias.

Next, we estimate the models separately by gender. This is justifiable because there were no cross-gender pairings in the experiment (in other words females only interacted with females and males only with males).[21] Tables 5 and 6 shows the gender-differentiated models. Again we focus on the average marginal effects of the mixture model. Looking at the column labelled "AME" in Table 5, we see very strong non-linearities at work for males. Offers are 17.8% *higher* if Player B is of the same race as Player A (*Co-ethinic pair = 1*) and Player B is also mother-tongue English speaking. By contrast offers are 11.3% *lower* if Player B is mother-tongue English speaking, but not of the same race as Player A (*Co-ethinic pair = 0*). On the other hand, Table 6 shows that females make about 9% lower offers in co-ethnic pairs and this does not appear to depend on whether or not Player B is mother-tongue English. In other words, females always have negative in-group bias and this effect is not mediated by accent. This finding is consistent with several studies on discrimination by gender. For example, (Fershtman and Gneezy 2001) also find that discrimination is driven by males in their study.

Finally we split the sample further to focus only on the behaviour of Black Player Bs. While being White and speaking English as a mother tongue is almost synonymous, this is not true for Black Player Bs.[22] Thus, if the race effect is non-linear in accent, this would manifest itself most sharply among Black Player Bs. Table 7 confirms this hypothesis. Specifically, Black Player As make significantly lower offers to Black Player Bs (*Co-ethinic pair* = 1), compared to White Player As offers to Black Player Bs (*Co-ethinic pair* = 0). This result by itself suggests that Blacks exhibit negative in-group bias relative to White Player Bs who are paired with Black Player Bs. However, this apparent in-group bias of Black Player As is attenuated if the Black Player B has a mother-tongue English accent. Again the interaction term is not significant in the model when we pool both genders but restrict the sample to Black Player Bs. However the non-linearity of race in accent becomes much more evident when we

[20] Citizenship score is a binary variable. If the average score is less than 0.5 then it takes the value of 0 indicating that the subject was not rated as a South African citizen by the third-party evaluators. Attractiveness and trustworthiness are measured on a scale of 1-10, and is taken as an average of the scores provided for each Player B from six-distinct evaluators who did not participate in the experiment.

[21] Although it is an open question of whether it is appropriate to assume separate error processes for males and females, this assumption greatly simplifies the analysis since we are also interested in gender-differentiated effects, which in a pooled model would require the inclusion of the three main effects, and four interaction effects. Clearly that many interaction effects would greatly complicate interpretation. Estimating the models separately by gender therefore has the added benefit of parsimony.

[22] 93% of White students are mother-tongue English speaking, whereas only 38% of Black students are mother-tongue English speakers in our sample.

estimate the models separately by gender, as is shown in Tables 8–9: accent is an important mediator for Black males but not so much for females. For black males who are paired with other black males, Table 8 shows that Player A trusts Player B about 11.5% *more* if Player B has a mother tongue English accent. By contrast (and consistent with the results of Table 6), females seem less sensitive to the signal package. Table 9 shows that female Player As trust female Player Bs about 9% *less* if Player B has a mother tongue English accent.

Of course we do not rule out the possibility of a risk confound, but in our context risk probably matters even less because we are focusing on the interaction effect between race and accent. It could be that a measure of risk turns out to have an independent effect in our trust regressions, but if it wipes out the interaction effect, this by itself would not alter any of our qualitative findings, as it would mean, for example that Black males paired with other Black males that do not speak with a BSAE accent view the exchange as a less risky prospect. It's not obvious whether knowing if this could be true would add much insight as, it would not fundamentally alter the fact that this particular pairing exhibits strong non-linearities in in-group favouritism.

Evidently, the insignificant interaction term shown in the pooled results of Table 7 reflects the fact that men and women respond differentially (and in different directions) to the signal package. Men are much more sensitive to the audial signal than women. This finding stands in contrast to Croson and Gneezy (2009) who's reading of the literature on gender differences in preferences is that women are generally more sensitive to social cues than men. Our findings suggest that men discriminate on at least one more salient dimension (accent) than women. For men, hearing an accent can change the direction of discrimination in trust (from negative to positive) if similarity is higher in race and low in accentedness, whereas, on average a female Player A distrusts a female player Player B if they share the same race as they do, irrespective of their accent. Although we find that the amount expected in return from player B is positive and significant in all of our regressions, the magnitudes are extremely small (less than a a third of a percent for men and about half a percent for women). It appears therefore, in contrast to Buchan et al. (2008), that men do not view the interaction any more strategically than women, so this cannot account for the large gender differences we have found in terms of race-accent discrimination.

Finally, Tsutsui and Zizzo (2014) report that low status subjects are deferential to high status subjects in terms of comparatively higher trust. This is similar to our findings for males (if the race-language interaction terms serves as a signal of status), except we show that this holds true irrespective of the status Player A.

6 Conclusion

Race stereotyping based on visual cues may result in different types of discrimination. Adding an extra dimension by incorporating audial cues reveals how behaviour is updated in the face of the new information. This paper focused on how mother-tongue English accent interacts with the race effect especially for Black subjects. The results suggest that accents do matter and this result is especially pronounced for Black males as they exhibit higher levels of trust when they hear a mother-tongue English accent.

An important question is why we observe such differential treatment based on accents. We speculate that this is a systematic pattern of high-status vs. low-status language legacy that still reverberates in contemporary South Africa. More specifically, for reasons connected with colonial history, English has widespread use in the high-status domains of politics, media and education. Barkhuizen & Gough (1996) assert that during the apartheid era, colonial languages such as English were endorsed with a perception of "power" by being sanctioned as the sole means to education and societal mobility. The other side of the coin is that African languages were given a "lower-status" as they were merely categorized as a method of interaction within "native" communities. Our results suggests that in non-market interactions characterised by asymmetric information where trust is vital, this fragmentation along high-status/low-status language remains salient in the post-apartheid context of South Africa.

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Figure 1: Modelling Trust

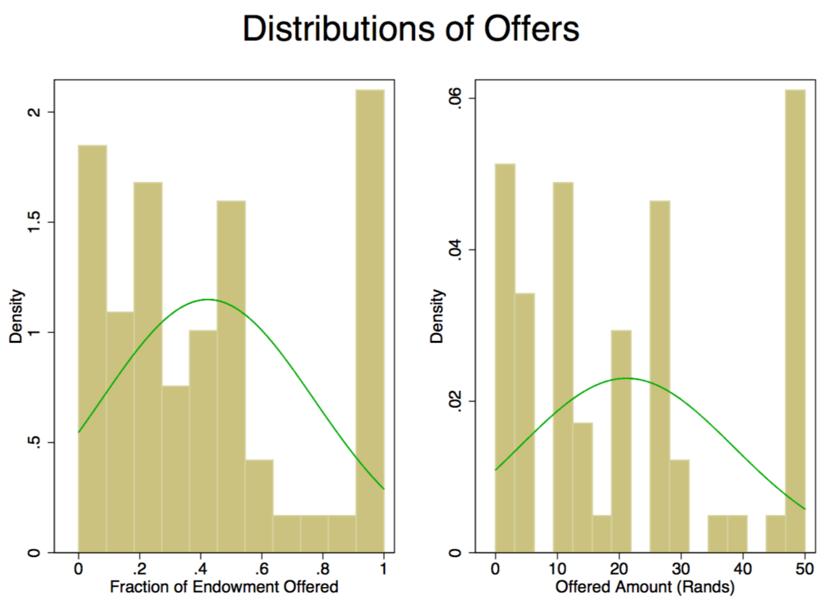

Table 1: Sample Characteristics by Co-ethnicity

	Non Co-ethnic Pair	Co-ethnic Pair	Total
Offers:			
Amount sent by Player A	23.40	19.43	21.16
	(18.18)	(16.61)	(17.36)
Fraction of offer	0.468	0.389	0.423
	(0.364)	(0.332)	(0.347)
Offer expected in return	33.09	24.93	28.48
	(31.17)	(22.04)	(26.61)
Non-anonymous interaction	0.0175	0.122	0.0763
	(0.132)	(0.329)	(0.267)
Demographics:			
Age in years today	20.18	20.07	20.12
	(1.869)	(1.885)	(1.871)
Player B is MTE (self-assessed)	0.596	0.514	0.550
	(0.495)	(0.503)	(0.499)
Player A receives financial aid	0.255	0.343	0.305
	(0.440)	(0.478)	(0.462)
Player A is a South African citizen	0.839	0.775	0.803
	(0.371)	(0.421)	(0.399)

Table 2: Test of Differences in Means by Co-ethnicity

	(1) diff.	
Amount sent by Player A	3.971	(1.30)
Fraction of offer	0.0794	(1.30)
Offer expected in return	8.155	(1.75)
Non-anonymous interaction	-0.104*	(-2.25)
Age in years today	0.108	(0.32)
Player B is MTE (self-assessed)	0.0830	(0.94)
Player A receives financial aid	-0.0884	(-1.03)
Player A is a South African citizen	0.0646	(0.91)
Observations	131	

Table 3: Trust, Ethnicity and Mother Tongue (no controls for OVB)

	AME b/se	AMEno01 b/se	AME2 b/se	AMEno012 b/se
Player A is male	0.0228	0.0349	0.0245	0.0376
	(0.021)	(0.032)	(0.021)	(0.032)
Player A is Black	0.0014	0.0021	0.0131	0.0201
	(0.026)	(0.040)	(0.031)	(0.047)
Co-ethnic pair	-0.0105	-0.0161	-0.0338	-0.0518
	(0.024)	(0.036)	(0.034)	(0.052)
Offer expected in return	0.0042*	0.0064*	0.0042*	0.0065*
	(0.001)	(0.001)	(0.001)	(0.001)
Player B is MTE (self-assessed)	-0.0282	-0.0433	-0.0525	-0.0804
	(0.023)	(0.035)	(0.042)	(0.065)
Co-ethnic pair × Player B is MTE (self-assessed)			0.0373	0.0572
			(0.049)	(0.075)
Observations	117	117	117	117

† Sig: ***$p < 0.1$, **$p < 0.05$, *$p < 0.001$.

‡ Std. errors reported in parenthesis, robust to arbitrary forms of heteroscedasticity.

†† Dependent variable: fraction of endowment offered in trust game; Additional controls: Player A receives financial aid; Player A is South African; Age of player A; Age squared of player A; Interaction is anonymous. MTE refers to “Mother tongue is English” .

Table 4: Trust, Ethnicity and Mother Tongue

	AME1 b/se	AMEno011 b/se	AME2 b/se	AMEno012 b/se
Co-ethnic pair	-0.0144	-0.0220	-0.0593***	-0.0909***
	(0.024)	(0.036)	(0.032)	(0.049)
Offer expected in return	0.0042*	0.0065*	0.0043*	0.0066*
	(0.001)	(0.001)	(0.001)	(0.001)
Player B is MTE (self-assessed)	-0.0302	-0.0463	-0.0762**	-0.1168**
	(0.024)	(0.037)	(0.037)	(0.056)
Attractiveness score of Player B (3rd party rated)	-0.0106	-0.0162	-0.0105	-0.0161
	(0.009)	(0.014)	(0.009)	(0.014)
SA citizen score of Player B (3rd party rated)	0.0513***	0.0787***	0.0622**	0.0954**
	(0.030)	(0.046)	(0.029)	(0.044)
Trustworthiness score of Player B (3rd party rated)	0.0149	0.0229	0.0161	0.0246
	(0.020)	(0.030)	(0.018)	(0.028)
Co-ethnic pair × Player B is MTE (self-assessed)			0.0704	0.1079
			(0.044)	(0.066)
Observations	117	117	117	117

***

† $p < 0.1$, ** $p < 0.05$, * $p < 0.001$.

‡ Std. errors reported in parenthesis, robust to arbitrary forms of heteroscedasticity.

†† Dependent variable: fraction of endowment offered in trust game; Additional controls: Player A receives financial aid; Player A is South African; Age of player A; Age squared of player A; Interaction is anonymous. MTE refers to "Mother tongue is English" .

Table 5: Trust, Ethnicity and Mother Tongue: Males

	AME	AMEno01
	b/se	b/se
Co-ethnic pair	-0.0677	-0.1134
	(0.046)	(0.075)
Offer expected in return	0.0031*	0.0053*
	(0.001)	(0.001)
Player B is MTE (self-assessed)	-0.1126**	-0.1887**
	(0.051)	(0.083)
Co-ethnic pair × Player B is MTE (self-assessed)	0.1783*	0.2987*
	(0.055)	(0.086)
Attractiveness score of Player B (3rd party rated)	-0.0206	-0.0345
	(0.020)	(0.033)
SA citizen score of Player B (3rd party rated)	0.0887	0.1487
	(0.067)	(0.111)
Trustworthiness score of Player B (3rd party rated)	0.0330	0.0553
	(0.022)	(0.037)
Observations	61	61

***

† $p < 0.1$, ** $p < 0.05$, * $p < 0.001$.

‡ Std. errors reported in parenthesis, robust to arbitrary forms of heteroscedasticity.

†† Dependent variable: fraction of endowment offered in trust game; Additional controls: Player A receives financial aid; Player A is South African; Age of player A; Age squared of player A; Interaction is anonymous. MTE refers to “Mother tongue is English” .

Table 6: Trust, Ethnicity and Mother Tongue: Females

	AME b/se	AMEno01 b/se
Co-ethnic pair	-0.0892***	-0.1248***
	(0.053)	(0.074)
Offer expected in return	0.0058*	0.0081*
	(0.001)	(0.001)
Player B is MTE (self-assessed)	-0.0162	-0.0226
	(0.045)	(0.063)
Co-ethnic pair × Player B is MTE (self-assessed)	-0.0159	-0.0222
	(0.063)	(0.089)
Attractiveness score of Player B (3rd party rated)	-0.0018	-0.0025
	(0.013)	(0.018)
SA citizen score of Player B (3rd party rated)	0.0539**	0.0754*
	(0.021)	(0.029)
Trustworthiness score of Player B (3rd party rated)	0.0052	0.0072
	(0.028)	(0.039)
Observations	56	56

***

† $p < 0.1$, ** $p < 0.05$, * $p < 0.001$.

‡ Std. errors reported in parenthesis, robust to arbitrary forms of heteroscedasticity.

†† Dependent variable: fraction of endowment offered in trust game; Additional controls: Player A receives financial aid; Player A is South African; Age of player A; Age squared of player A; Interaction is anonymous. MTE refers to "Mother tongue is English" .

Table 7: Trust, Ethnicity and Mother Tongue – Black player Bs

	AME b/se	AMEno01 b/se
Co-ethnic pair	-0.0623**	-0.0923**
	(0.030)	(0.044)
Offer expected in return	0.0044*	0.0066*
	(0.001)	(0.001)
Player B is MTE (self-assessed)	-0.0074	-0.0109
	(0.062)	(0.092)
Co-ethnic pair × Player B is MTE (self-assessed)	0.0300	0.0445
	(0.066)	(0.097)
Attractiveness score of Player B (3rd party rated)	0.0067	0.0099
	(0.012)	(0.018)
SA citizen score of Player B (3rd party rated)	0.0653***	0.0968***
	(0.038)	(0.055)
Trustworthiness score of Player B (3rd party rated)	0.0101	0.0149
	(0.026)	(0.038)
Observations	79	79

***

† $p < 0.1$, ** $p < 0.05$, * $p < 0.001$.

‡ Std. errors reported in parenthesis, robust to arbitrary forms of heteroscedasticity.

†† Dependent variable: fraction of endowment offered in trust game; Additional controls: Player A receives financial aid; Player A is South African; Age of player A; Age squared of player A; Interaction is anonymous. MTE refers to "Mother tongue is English" . The race dummy is excluded as it is perfectly collinear with *Co-ethnic pair* when restricting the sample only to Black player As.

Table 8: Trust, Ethnicity and Mother Tongue: Males – Black player Bs

	AME b/se	AMEno01 b/se
Co-ethnic pair	-0.0607	-0.1028
	(0.047)	(0.079)
Offer expected in return	0.0031*	0.0053*
	(0.001)	(0.001)
Player B is MTE (self-assessed)	0.0089	0.0152
	(0.046)	(0.078)
Co-ethnic pair × Player B is MTE (self-assessed)	0.1151**	0.1950**
	(0.050)	(0.079)
Attractiveness score of Player B (3rd party rated)	-0.0327	-0.0554
	(0.022)	(0.036)
SA citizen score of Player B (3rd party rated)	0.0529	0.0896
	(0.056)	(0.093)
Trustworthiness score of Player B (3rd party rated)	0.0590*	0.1000*
	(0.016)	(0.022)
Observations	37	37

***

† $p < 0.1$, **$p < 0.05$, *$p < 0.001$.

‡ Std. errors reported in parenthesis, robust to arbitrary forms of heteroscedasticity.

†† Dependent variable: fraction of endowment offered in trust game; Additional controls: Player A receives financial aid; Player A is South African; Age of player A; Age squared of player A; Interaction is anonymous. MTE refers to "Mother tongue is English" . The race dummy is excluded as it is perfectly collinear with *Co-ethnic pair* when restricting the sample only to Black player As.

Table 9: Trust, Ethnicity and Mother Tongue: Females – Black player Bs

	AME b/se	AMEno01 b/se
Co-ethnic pair	-0.0905*** (0.053)	-0.1210*** (0.069)
Offer expected in return	0.0057* (0.001)	0.0076* (0.002)
Player B is MTE (self-assessed)	0.0180 (0.072)	0.0241 (0.097)
Co-ethnic pair × Player B is MTE (self-assessed)	-0.0444 (0.086)	-0.0594 (0.115)
Attractiveness score of Player B (3rd party rated)	0.0072 (0.017)	0.0096 (0.022)
SA citizen score of Player B (3rd party rated)	0.0611** (0.027)	0.0817** (0.035)
Trustworthiness score of Player B (3rd party rated)	-0.0012 (0.035)	-0.0017 (0.047)
Observations	42	42

***

† $p < 0.1$, **$p < 0.05$, *$p < 0.001$.

‡ Std. errors reported in parenthesis, robust to arbitrary forms of heteroscedasticity.

†† Dependent variable: fraction of endowment offered in trust game; Additional controls: Player A receives financial aid; Player A is South African; Age of player A; Age squared of player A; Interaction is anonymous. MTE refers to “Mother tongue is English” . The race dummy is excluded as it is perfectly collinear with *Co-ethnic pair* when restricting the sample only to Black player As.

southern africa labour and development research unit

The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy. In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.

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