Cooperation across income and racial categories: Pre-analysis plan

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Abstract

Ethnically diverse communities are often found to have lower levels of solidarity and cooperation than homogeneous communities. However, ethnically diverse communities are usually also poor communities, and it is not clear whether racial diversity rather than diffused poverty may undermine their cooperative capacity. In our project we study how prosocial behavior is affected by the ethnicity and economic status of alters, and test a few hypotheses concerning how ethnic bias and expectations about alter's strategic behavior affect prosocial behavior. We developed a cooperative investment game in which the optimal outcome is only realized when the two partners cooperate, and payouts are only made after two weeks. We will employ this measure to test for differences in cooperation in a pool of participants recruited on Amazon Mechanical Turk (N ≈ 1200). The participants will engage in the cooperation task with an interaction partner whose identity varies along racial (white or black) and income (earning 10,000–20,000\$/year or 60,001–80,000\$/year) lines. This design will allow us to compare cooperative behavior toward low-income Blacks, low-income Whites, high-income Blacks, and high-income Whites. We will also measure altruistic behavior using a standard dictator game, and will record demographic and income data. These additional measures will allow us to assess whether discriminatory behavior is due to ethnic bias or strategic considerations about alter's behavior, and to analyze results for subgroups of participants.

Keywords: Ethnoracial diversity; cooperation; poverty

JEL classification: C90, D71, I32, J71, Z13

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1 Motivation and background

Various research findings show that ethnoracially diverse communities have lower levels of solidarity and cooperation than homogeneous communities (Schaeffer 2014; Van der Meer and Tolsma 2014; Alesina, Baqir, and Easterly 1999; Alesina, Devleeschauwer, et al. 2003; Costa and Kahn 2003; Putnam 2007). A few reasons have been advanced: cooperation in diverse communities might be hindered by prejudice and outgroup discrimination, by cultural differences and disagreement concerning norms and preferred outcomes, or by weak social networks and difficulties in communication and social control across ethnic groups (Habyarimana et al. 2009; Koopmans and Veit 2014; Kimenyi 2006; Algan, Hémet, and Laitin 2011; Miguel and Gugerty 2005; Lieberman and McClendon 2013; Enos and Gidron 2016).

However, ethnically diverse communities are often also poor communities, and thus diffused poverty, rather than ethnoracial diversity, might be at the basis of their lower cooperative capacity (Robert J. Sampson and Groves 1989; Robert J. Sampson, Raudenbush, and Earls 1997; Robert J Sampson 2012; Bruinsma et al. 2013; Abascal and Baldassarri 2015). Recent behavioral research suggests that scarcity produces a specific mind-set: in particular, people who are subjected to the stress of poverty 1) tend to discount the future more than people who do not live in conditions of chronic disadvantage, and 2) suffer from cognitive burden (Banerjee and Duflo 2011; Mani et al. 2013; Mullainathan and Shafir 2013; Haushofer and Fehr 2014). Here we theorize that these effects of poverty may influence cooperative behavior, as poor individuals might discard the future benefits of cooperation, and might be more erratic in their decision-making. In addition, poverty may also affect expectations: poor people might be considered less reliable cooperation partners, and might have fewer opportunities to participate in cooperative endeavors in the first place. In sum, poverty, as well as diversity, may be related to lower levels of cooperation. We turn to an experimental design to disentangle these two factors.

To test various hypotheses concerning the relative effect of ethnic diversity and poverty on cooperative behavior we developed a cooperative investment game and experimentally manipulate the identity of the interaction partner along racial and income lines. In addition, we compare behaviors in the cooperative investment game and a dictator game to distinguish between an underlying discriminatory *bias* against racial out-groups (and the poor) and discriminatory behavior based on *expectations* about alter's behavior. Taken together, our results will contribute to the understanding of the mechanisms that bring about cooperation in diverse communities. Given that poor people often live in communities

that are both poor and racially diverse, our research findings might have far-reaching consequences for overall cooperation levels in contemporary societies.

2   Methods and procedures

We plan to implement an online experiment, recruiting around 1200 participants on Amazon Mechanical Turk.

2.1   Experimental Design

The planned online experiment consists of three elements. First, participants are asked to provide socio-demographic information about themselves: their age, sex, household income, and race. Second, participants are matched with another MTurker and shown his/her basic demographic information. We manipulate the matching process in order to randomize alter's gender, income (alternating between either '10,000-20,000\$/year' or '60,001-80,000\$/year'), and race (althernating between 'White' and 'Black or African American') and keep age constant. We thus implement a 2^3 factorial design, although we are mainly interested in the effect of alter's income and race on the participants' decision. Namely, we focus our analysis on the four treatment conditions depicted in Table 1.

Table 1: Treatment conditions

		Race	
		'White'	'Black'
Income	10-20k\$/year	White & Poor	Black & Poor
	60-80k\$/year	White & Rich	Black & Rich

Third, participants will engage in two decision tasks with their assigned alter: a cooperative investment game and a dictator game. Participants are presented with these tasks in a random order so that about half of them take part to the dictator game first, and about half to the investment game first. Participants are informed about their payoffs after they have taken both decisions.

In the cooperative investment game, participants are given an endowment, and will have to decide whether they want to keep the endowment, or whether they want to invest their endowment. Keeping the endowment results in participants having the amount paid out immediately. Investing promises a 33% return on their investment after a two weeks wait. This return is only realized if alter chooses to invest, too, however. If the partner chooses not to invest, participants lose 20% of their endowment

and still have to wait two weeks to be paid (Table 2). Since it is prohibitive to implement real-time matching, our participants are matched with a person whose sociodemographic profile corresponds to the alter described in the experiment. The person's decision in the cooperative investment game was recorded in a pre-test.

Table 2: The cooperative investment game

Interaction partner

		Keep	Invest
Participant	Keep	100% immediately / 100% immediately	100% immediately / 80% in two weeks
	Invest	80% in two weeks / 100% immediately	133% in two weeks / 133% in two weeks

In its raw payouts, the cooperative investment game has the structure of a stag-hunt game (Skyrms 2004), which is a less punitive version of a prisoner dilemma game. In this game, cooperation is the optimal solution if ego is confident that alter will cooperate (and believes that the other person also holds this belief, and so on). However, our cooperative investment game adds a time dimension, which captures the extent to which individuals tend to discount future gains in favor of an immediate reward. According to recent psychological research (Mullainathan and Shafir 2013; Mani et al. 2013; Haushofer and Fehr 2014), this 'present bias' is quite common among the poor, and, we argue, could be at the origin of their reduced propensity to cooperate.

We speculate that this present bias may vary across individuals. In an extreme scenario, for individuals with very high time discounting rates, the cooperation payoff (133% of the endowment) may be discounted to the point of being lower than the value of the endowment that is received immediately. For such individuals, it would always be optimal not to invest. Moreover, participants in the cooperative investment game should also gauge their partner's time-discounting rate, and how their partner will assess their own time-discounting rate. The game was intentionally constructed this way to give us a measure of cooperation that sensitively depends on expectations about alter's willingness to cooperate, but also to reflect the fact that many real-life cooperation situations involve a time dimension.

In sum, the main factors that guide decision making in the cooperative investment game are: Individual cooperative propensity (which, in itself, may partly be affected by risk aversion), individual present bias, expectations about alter's cooperative propensity, and expectations about alter's present bias.

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Since alters' profiles are randomized, we can rule out the possibility that differences in cooperation across the four cells of Figure 1 are due to participants' individual propensities and present bias. Thus differences in behavior can be ascribed to expectations about alter's behavior as a function of alter's identity. Here we can't tell apart whether expectations are about alter's propensity to cooperate or present bias, but we can control for any underlying bias against (or in favor) of alter due to his ethnicity or economic status. Namely, we measure prosocial inclination toward alter using a dictator game, an allocation task that does not entail strategic interaction with alter.

In the dictator game, participants are allocated 100 monetary units and told that either they or their partner will be asked to decide, anonymously, how to split the amount between themselves. All participants are assigned to the role of the decider. The resulting dictator allocations will be given to individuals in our sample that fit the profile of the interaction partner shown. For example, white low-income individuals in our sample will receive amounts allocated to alters of this profile. These payments will be made after the conclusion of the data collection.

2.2 Additional survey questions

Besides the answers to the initial questionnaire and the game decisions, we will collect additional information about our subjects' education, occupation, household size, ability to save and difficulty in paying bills. These data will be collected after the participants have made their decisions. The post-decision questionnaire will also include questions on participants' self-rated risk-proneness and preference for immediate payments, and will include a manipulation check, asking people to recall the characteristics of their interaction partner.

2.3 Sample and payment

We will run our experiment on Amazon Mechanical Turk (AMT), an online crowdsourcing marketplace operated by Amazon.com. We aim to recruit a sample of N = 1208 participants. This sample size will allow us to discover main effects in the propensity to invest (our main dependent variable of interest) with a relative risk ratio of 1.2 at a significance level of 0.05 and with a power of 0.8, assuming the base-level propensity to invest is 0.4 (which a pre-test has shown to be realistic). [1]

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[1] We will restrict our sample to workers who have worked on at least 100 tasks and have an approval rating of over 85% to ensure the quality of responses(cp. Peer, Vosgerau, and Acquisti 2014).

Participants will receive a fixed payment of $0.20 and a variable payment from the dictator game and cooperative investment game of $0.32–$0.80. Overall, participants will receive between $0.52 and $1.00 for a task that should take no longer than 4 minutes to complete. Thus, our hourly wage is between $7.80 and $15.00, well above the US federal minimum wage of $7.25.

3 Hypotheses Testing

Our research design allows us to test hypotheses concerning the causal effect of our treatments, as well as gather empirical evidence from observational data, and estimate heterogenous treatment effects for subgroups of our sample.

Our major hypotheses concern the causal effect of alter's identity – namely his/her ethnicity and economic status – on ego's cooperative behavior. First of all, we expect that participants matched with a 'poor' alter will be less likely to invest. We speculate that this is because poor people tend to be more present-biased, while cooperation typically requires foresight and appreciation of future gains. Assuming that participants are (intuitively) aware of this, they will be more hesitant to invest when interacting with poor rather than rich subjects.

H1 Participants invest at lower rates in low-income partner treatment as compared to the high-income partner treatment

Based on previous observational research, we also expect to find a lower propensity to invest in the cooperative game when participants are matched to Black partners.

H2 Participants invest at lower rates in the Black partner treatment as compared to the White partner treatment

Interestingly, lower levels of cooperation with ethnic minorities can be due to a variety of reasons, from imbued prejudice towards them (e.g., dislike of Blacks) to specific expectations about minorities' strategic behavior in cooperative contexts. If negative feelings toward Blacks were driving behavior, we would find lower contributions to Black partners in the dictator game and also find that contributions in the dictator game largely predict behavior in the cooperative investment game.[1]

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[1] We do not have sufficient theory and priors to believe that differential cooperation with poor people is due to a dislike of them, but we will also control for this aspect in our analysis.

H2.a Participants give less to black recipients in the dictator game than to white recipients; and lower cooperation in the investment game is largely accounted for by behavior in the dictator game.

In contrast, if lower cooperation is mainly due to expectations about Blacks' behavior, then we need to figure out whether these negative expectations are related to ethnicity per se – i.e., the belief that Blacks are unreliable – or whether ethnicity is used as a proxy for other factors, such as poverty. In particular, it is possible that part of the discriminatory behavior toward Blacks is driven by considerations regarding the economic conditions of most Blacks. In the latter case, varying information about the economic conditions may affect these expectations. Our research design, allowing us to compare cooperation with high- and low-income Blacks and Whites is mainly intended to address this aspect. Namely, if ethnicity is simply a proxy of economic conditions, we expect that:

H2.b There are no differences in levels of cooperation towards Blacks and Whites once we consider their income status.

In contrast, if negative expectations about Blacks exist, beyond economic considerations, we would find that:

H2.c Blacks elicit less cooperation than Whites who are in their same income category.

We do not have strong expectations as to how gender may affect cooperative behavior, but anticipate that when interacting sex with the other two treatments, male, low-income Blacks will elicit the lowest rates of cooperation, as this is the most-widely negatively stereotyped group (cp. Fershtman and Gneezy 2001, for a similar logic of argument and results from Israel).

H3.a Male, low-income minority members will elicit the lowest rates of cooperation.[1]

3.1 Additional analysis

Some of our hypotheses imply that individuals are less likely to cooperate with ethnic minorities and poor people because they expect these categories to be themselves less cooperative. Whether this is true or not may not matter for our subjects,[2] but it is of theoretical and policy interest. Building on

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[1]Note: we do not have an explicit hypothesis about an interaction effect between income and race, but do not exclude the possibility that there is some non-linear effect.

[2]Expectations are often based on prejudice and stereotypes that are not always accurate.

previous experimental research, we advance the hypothesis that poor people are greatly affected by present-bias, and therefore expect them to invest at a lower rate in the cooperative investment game. Although we do not have strong reasons to believe that Blacks, or ethnic minorities in general, are less prone to cooperate, there is ample evidence suggesting that ethnic minorities report lower levels of trust (Simpson, McGrimmon, and Irwin 2007; Abascal and Baldassarri 2015), and some literature concerning different levels of giving in a dictator game (Abascal 2015; Habyarimana et al. 2009; Whitt and Wilson 2007). For descriptive purposes, we will therefore analyze levels of cooperation of low-income and minority participants. We will perform several descriptive analyses to check for possible confounders and eventually include them in our analysis as controls.

3.2 Conditional treatment effects

We also formulate hypotheses with regard to heterogenous treatment effects for subgroups of our participants. For the cooperative investment game we hypothesize that low-income participants may be the most likely to respond negatively to a poor partner, because, being themselves poor, they could have more precise expectations about the behavior of low-income people. For other demographic groups, we do not have strong expectations with regard to heterogenous treatment effects.

4 Data analysis

We will present balance statistics comparing treatment and control groups for our three treatment variables, and will test for the assumption that assignment to treatment is independent of individual characteristics of the participants with the F-statistic from a regression of the treatment on all included covariates.

All hypotheses will be tested using OLS. For the cooperative investment game, we will additionally provide probit estimates. We use heteroskedasticity-robust (White) standard errors to account for the fact that our treatment groups will most likely be slightly unbalanced (as we use a simple randomisation procedure, where participants are allocated to conditions as they arrived) (Samii and Aronow 2012). We will control for pre-treatment characteristics of our subjects (sex, age, race, education, income, household size, occupation) to improve the precision of our estimates.

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Appendix

A   Script

A.1   Basic Socio-Demographic Profile

1. How old are you (in years)?

   years

2. Please indicate your sex?

   - Male
   - Female

3. What is your current annual household income before tax?

   - Currently have no income
   - under 10,000$/year
   - 10,000-20,000$/year
   - 20,001-30,000$/year
   - 30,001-40,000$/year
   - 40,001-60,000$/year
   - 60,001-80,000$/year
   - 80,001-100,000$/year
   - over 100,000$/year

4. Which category describes you best?

   - Hispanic
   - Black or African American
   - White
   - Asian
   - American Indian or Alaska Native
   - Middle Eastern or North African
   - Native Hawaiian or Other Pacific Islander
   - Another race, ethnicity, or origin

A.2   Tasks and Partner Introduction

You will now work on two decision tasks involving money. In the tasks we use the currency ₵, where $1.00 is equal to ₵375.[1] For both tasks, you will be matched with another MTurker. For data protection reasons, matching is random and anonymous, so you will not learn the identity of the other worker, nor will s/he learn yours. The only information you will receive about the other MTurker will be his/her answers to the preselection questionnaire.

[next page]

You have now been matched with the other MTurker and can start working on the decision tasks. Below you see the answers that the other MTurker gave in the preselection questionnaire:

How old are you (in years)?

- 42

Please indicate your sex:

- Male
- Female

What is your current annual household income before tax?

- 10,000-20,000$/year
- 60,001-80,000$/year

Which category describes you best?

- Black or African American
- White

After clicking 'Next', you will be asked to work on the first decision task.

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[1]Amounts are presented to the participants in the artificial currency ₵ to make the amounts involved and the relative differences between them more tangible.

A.3 Task I [Dictator game]

For this task, the two of you receive a total of ₵100.[1]

One person, the Decider, has to allocate the money between her/himself and the other person, the Receiver.

The Decider will take home whatever s/he has decided to keep for her-/himself, and the Receiver will take home whatever s/he has been allocated by the Decider.

On the next page, you will be randomly assigned to be either the Decider or the Receiver.

[next page]

You have been assigned to be the Decider.

Please decide how many of the ₵100 you want to keep for yourself. You can choose any number between 0 and 100.

Whatever you do not allocate to yourself will be given to the other MTurker.

Of the ₵100, I allocate ₵

[amount]

to myself.

B Task II [Cooperative investment game]

In this task, you have the opportunity to earn some extra money.

There are two ways of earning the extra money: You can choose to be paid a fixed amount immediately, or you can invest the money in a project together with the other MTurker. If you decide to invest, you will receive your payment in two weeks.

You and the other MTurker receive an initial amount of ₵150 each. Each of you can either choose to have the ₵150 paid out immediately, or, alternatively, can invest the amount in the project.

- If you both choose to be paid out immediately, each of you will receive your ₵150 within the next 24 hours (by [tomorrow's date] the latest).

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[1]Amounts are presented to the participants in the artificial currency ₵, whereby $1 correspond to ₵325. This is done to make the amounts involved and the relative differences between them appear more meaningful.

- If both you and the other MTurker decide to invest in the project, each of you will receive ℂ200 on [date in two weeks].
- If you decide to be paid out immediately, but the other MTurker decides to invest, you will receive your ℂ150 within the next 24 hours, and the other MTurker will receive back 80% of his or her investment in two weeks time. That is, the other worker will be paid ℂ120 on [date in two weeks].
- If you decide to invest, but the other worker decides to be paid out immediately, the other MTurker will receive ℂ150 within the next 24 hours, while you will be paid ℂ120 in two weeks time ([date in two weeks]).

These options are summed up in the table below.

Possible outcomes:	Your bonus:	The bonus will be transferred on:
Both you and the other MTurker choose to have the amount paid out immediately	ℂ150	[tomorrow's date] (within 24 hours)
You choose to have the amount paid out immediately, while the other MTurker invests in the project	ℂ150	[tomorrow's date] (within 24 hours)
Both you and the other MTurker choose to invest in the project	ℂ200	[date in two weeks] (in two weeks)
You choose to invest in the project while the other MTurker chooses to be paid out immediately	ℂ120	[date in two weeks] (in two weeks)

[next page]

Please decide if you want to have the ℂ150 paid out immediately, or if you want to invest the amount in the project.

- Have the amount paid out immediately
- Invest the amount in the project

B.1 Additional information

1. What is the highest level of education you have completed?
   - No formal schooling completed, or less than 1 year
   - Some primary schooling (not completed)
   - Primary school completed

- Some high school (not completed)

- High school completed (or equivalent)

- Some college (1-4 years, not completed)

- Associate's degree (including occupational or academic degrees)

- Bachelor's degree (BA, BS, AB, etc)

- Master's degree (MA, MS, MENG, MSW, etc)

- Professional school degree (MD, DDC, JD, etc)

- Doctorate degree (PhD, EdD, etc)

2. What is your principal occupation?

- Doing housework, looking after children or other persons

- Full-time work

- Part-time work

- In education

- Unemployed/looking for a job

- Retired

- Other

3. Including you, how many people live in your household?

- 1

- 2

- 3

- 4

- 5

- 6

- 7

- 8

- 9 or more

4. How much money do you manage to save each month?

- Practically none

- Under $50

- $50-$100

- $101-$200

- $201-$500

- $501-$1,000

- $1,001 or more

5. During the last month, did you experience financial difficulties in paying your regular bills?

- Yes

- No

6. Do you have children?

- no

- yes, 1 child

- yes, 2 children

- yes, 3 children

- yes, 4 children

- yes, 5 children

- yes, 6 children

- yes, 7 children or more

7. How much do you like to take risks?

- I like to take risks

- I don't mind taking risks

- I am careful not to take too many risks

- I do not like to take risks

8. Imagine you could choose to be paid $15 today, or you could choose to be paid $30 in two weeks.

Which of the following describes best what you feel:

- I much prefer to be paid $15 today

- I slightly prefer to be paid $15 today

- I don't mind whether I am paid $15 today, or $30 in two weeks

- I slightly prefer to be paid $30 in two weeks

- I much prefer to be paid $30 in two weeks

B.2 Motivation and manipulation checks

- Please let us know, in a few words, what motivated you to decide the way you did in the investment task. Please write at least 60 characters (~12 words).

- Please also let us know how you went about making your decision in the money-allocation task. Please write at least 60 characters (~12 words).

What do you remember about the other MTurker?

- How old was the other MTurker?
- Please indicate the sex of the other MTurker:
- What was the other MTurker's current annual household income before tax?
- Which category did the other MTurker use to describe him-/herself?

C Schedule of tasks and treatments

The participants will be presented with the tasks and treatments in the following order:

1. Survey 1
2. Priming with interaction partner
3. Dictator game *or (order randomly alternates)*
4. Cooperative investment game
5. Motivation and manipulation checks
6. Survey 2