

# Markets and Morality: How Markets Shape Our (Dis)Regard for Others

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**Abstract** Theorists since David Hume and Adam Smith have debated possible causal connections between economic market experiences and “moral sentiments”—that is, beliefs concerning what constitutes right and wrong, and the nature of one’s responsibilities to others. Some have hypothesized that participation in market competition may encourage an increasing prioritization of self-interest over social responsibilities to others while other theorists have proposed that competitive markets may foster greater altruism, mutual understanding, and broader social ties through the disruption of geographical and tribal isolation—what eighteenth-century political philosophers called the *doux commerce* thesis. We use an international experimental design to evaluate this thesis by measuring the impact of market interactions on utilitarian versus deontological values, others-regarding preferences, and charitable donations. Through a labor-market intermediary, we randomly assign workers to different market conditions: competitive (tournament) or commodifying (piece-rate). We find that in contexts with lower levels of income, competition increases others-regarding preferences, deontological commitments towards out-group members, productivity, and charitable donations by productive workers (but decreases donations by less productive workers). In contexts with higher levels of income, these effects flip: competition decreases others-regarding preferences and decreases deontological commitments as utilitarian principles of maximization assume greater prominence in decision-making. The effect of competition on deontological commitments to others thus reverses with increasing income. In light of growing economic inequality and reduced social cohesion observed in many wealthy nations today, our findings suggest a greater need for market regulation at higher levels of income to counteract the corrosion of social relations by unmitigated market forces.

**Significance** Whether and how participation in economic markets shapes moral beliefs, behaviors, and social relationships has long been a subject of debate. While many have argued that unregulated market interactions corrode individuals’ sense of responsibility to others and intensify self-interested behavior, others have speculated that market competition may increase empathy and generosity by fostering social ties across groups. This international experiment tests these claims by randomly assigning workers to either competitive or non-competitive market conditions. We find that at lower levels of income, competition increases moral commitments to others, but that at higher levels of income, competition increases self-interested behavior. Our findings suggest that market regulation becomes more important for protecting social cohesion and interpersonal responsibility as income levels increase.

## 1 Background and Overview

At least since Adam Smith and David Hume, scholars have offered hypotheses about the effect of a citizen’s economic experience on his or her moral convictions as an individual in a social group. Some have theorized that competition may foster a winner-take-all mentality and a lack of concern for others or that exposure to market values will lead market participants to abandon non-utilitarian forms of moral thought, treating every issue of social judgment in terms of costs and benefits stripped of sentiment. On the other hand, proponents of the *doux commerce* thesis—a theory popularized by eighteenth-century political philosophers—have proposed that a competitive market, with its disruptive effect on geographical and tribal isolation, should have effects that improve altruism and social ties, increasing individual actors’ care for and understanding of others.

Against this theoretical backdrop, which is elaborated in greater depth in Web Appendix A, this paper estimates the causal impact of market interactions on utilitarian versus deontological values, charitable donations, and on whether individuals subscribe to different in-group/out-group moral norms. Using a labor market intermediary, Amazon Mechanical Turk, we recruit workers to transcribe historical texts. We randomly assign workers to different market conditions—individual-based vs. tournament-based compensation that depends on transcription accuracy—in order to distinguish the self-selection into market settings from the causal effect of market experiences on moral values. The experiment has a 2x2x2 design that varies the form of compensation and four variations of the moral trolley problem described below.

Using a between-subject design, our first main finding is that workers who are assigned individual-based compensation become more utilitarian while workers who are assigned to tournament-based compensation become more deontological. After workers finish data entry, we administer the moral trolley test. The moral trolley hypothetical is a tool that is commonly used to measure normative commitments (Greene et al. 2001). In its most basic form, the moral trolley problem asks individuals whether they would kill one person in order to

save five. The trolley problem has many versions that measure various dimensions of moral decision-making. We use the standard modification to measure utilitarian versus deontological values and conceive of another modification to measure other-regarding preferences. In the bystander scenario, individuals are asked if they would divert a trolley to save five but kill one. Subjects who say they are willing to do so are considered utilitarian. In the footbridge scenario, individuals are asked if they would push someone in front of the trolley and kill him but save five. Subjects who say they are not willing to do so are considered deontological. The latter scenario emphasizes the utilitarian versus deontological contrast in moral values because it emphasizes the act involved in pushing an individual to his death vs. the duty not to do so. Of the 90 workers assigned individual-based compensation, 63% made the utilitarian choice; of the 90 workers assigned the tournament condition, 49% made the utilitarian choice. The difference comes entirely in the footbridge scenario, where 47% of non-tournament workers made the utilitarian choice but 13% of tournament workers made the utilitarian choice, an almost fourfold increase; in the bystander scenario, 83% of both groups of workers made the utilitarian choice.

Our second main finding is that workers who are assigned to individual-based compensation become more utilitarian towards out-groups while workers who are assigned to tournament-based compensation become more deontological towards out-groups.<sup>1</sup> To investigate whether subjects have differential in-group, out-group moral views and whether those views are shaped by their incentive treatment, in our modification of the moral trolley problem we vary the racial appearance of the individuals in an illustration of the moral trolley problem. All workers see an illustration of the choice between saving one individual or five individuals in the path of an oncoming trolley, but half see an illustration with light-skinned individuals and half see an illustration with dark-skinned individuals. Subjects only see one trolley problem in order to avoid contrast effects. We present moral trolley problems with

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<sup>1</sup>Laboratory experiments and theoretical studies suggest that market interactions affect the treatment of non-group members (Dufwenberg, Heidues, Kirchsteiger, Reidel, and Sobel 2008, Echebarria-Echabe and Guede 2003).

different racial appearances to investigate where people draw the line between in-groups and out-groups and whether competition makes them more utilitarian regarding out-group members.<sup>2</sup> White workers are 38% more likely than non-White workers to make the utilitarian choice when presented the dark-skinned illustration than when presented the light-skinned illustration in the individual-based compensation condition, but White workers are 24% less likely than non-White workers to make the utilitarian choice when presented the dark-skinned illustration than when presented the light-skinned illustration in the tournament condition.

Our third main finding is that tournament winners are more likely to donate than tournament losers or non-tournament workers, though on average non-tournament workers donate more than tournament workers. 51% of non-tournament and 41% of tournament workers choose to donate. Among the tournament workers, 54% of tournament winners and 32% of tournament losers donate. At first glance, the finding that tournament winners donate more than tournament losers contradicts an established literature in experimental economics that finds that individuals who feel they deserve their earnings are less generous (Hoffman et al. 1994). In those studies, however, subjects know that they have earned additional income. Importantly, our results suggest that, in studying the effects of market experiences, types of compensation should be distinguished from one another.

An important distinction between the labor market intermediary in our study and the laboratories in experimental economics studies is the representativeness of the laborers. In our case, drawing from a geographically diverse global labor base allows for the exploration of heterogeneous treatment effects, and in this application, an empirical analysis of the *doux commerce* thesis. Economists have widely thought that in the early stages of 'economic development'—that is, the development of economies premised on market principles—commerce increases subscription to existing morality, but that in the later stages of market development, commerce begins to erode and replace prior morality with market principles themselves

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<sup>2</sup>In this study, the term “other-regarding” refers to people who have greater sympathy with individuals of a different skin tone. Studies have found that people become more willing to sacrifice in the moral trolley problem when non-group members, such as non-human primates, are presented as the objects of sacrifice (Petrinovich et al. 1993; Petrinovich and O’Neill 1996).

(Hirschman 1982). We find that the effect of competition on deontological commitments reverses with income of the worker’s country, even though the transcription task is designed to be culturally neutral and the moral trolley problem too has been previously shown to be culturally neutral (Mikhail 2007). To explain why workers from countries at different levels of economic wealth respond differently, we might look to an established literature that documents how the social and affective conditions in which an individual is situated—such as exposures to and awareness of extreme poverty among their more immediate social contacts—inflects moral judgment. It is also possible the historical duration of market conditions in a specific context affects perceptions of competition; in locales where market-based competition is more developed and has a deeper historical roots, competition may be perceived as more fair or simply more taken for granted—that is, subject to lower levels of conscious awareness and scrutiny as it becomes more deeply embedded in social norms.

The potential for multiple equilibria is arguably our most interesting finding. The utilitarian tradeoff in the trolley problem may be more acceptable to participants in wealthy countries primed, by the tournament treatment, to think of the efficiency benefits from competition, while in poorer countries, the higher human costs of competition for the poor may make them more sensitive to the sacrificial victim in the trolley problem.

The rest of this paper proceeds as follows. Section 2 briefly reviews the empirical literature and presents a conceptual framework our experiments. Section 3 describes the experimental design. Section 4 presents and discusses the results. Section 5 draws conclusions.

## 2 Literature

**2.1 Measurement** The moral trolley problem asks individuals whether they would kill one person in order to save five. The trolley problem has many versions that measure various dimensions of moral decision-making (Thomson 1985). This study uses the standard modification (*bystander* vs. *footbridge* scenario) to measure utilitarian versus deontological values. The experimental literature generally labels the non-utilitarian choice in the moral trolley problem as deontological, so we use deontological and non-utilitarian interchangeably.

The philosophy literature tends to connote deontological commitments with ethical behavior (Bartels 2008; Nichols and Mallon 2006). Everett et al. (2016) found that participants who make deontological judgments are perceived as more moral and trustworthy and preferred as social partners.

In the *bystander* scenario, individuals are asked if they would divert a trolley to save five but kill one. Subjects who say they are willing to do so are considered *utilitarian*. In the *footbridge* scenario, individuals are asked if they would push someone in front of the trolley and kill him but save five. Subjects who say they are not willing to do so are considered *deontological*. A deontological perspective takes into consideration the Kantian categorical imperative to act in accordance with the moral law, regardless of whether doing so appears to produce good consequences. The footbridge scenario emphasizes the deontological aspect of moral values because it emphasizes the act involved in pushing an individual to his death versus the duty not to do so (Greene et al. 2001).

The modification we introduce to the moral trolley problem varies the racial appearance of the individuals being saved or sacrificed in the problem’s illustration. Researchers have presented the moral trolley scenario with names that are stereotypically White or Black (Uhlmann et al. 2009), but have not varied the skin tone, which may be a more effective means of priming possible relevant unconscious prejudices. All workers see an illustration of the choice between saving one individual or five individuals in the path of an oncoming trolley, but one half see an illustration with light-skinned individuals on the trolley tracks and footbridge and the other half see an illustration with dark-skinned individuals. There is also a decision-maker who has a question-mark for its face. We use the moral trolley illustration with different races to investigate where people draw the line between in-groups and out-groups and whether competition makes them more utilitarian regarding out-group members. Demographic information on the workers allows us to compare attitudes to saving or sacrificing people of the same or different racial appearance.<sup>3</sup>

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<sup>3</sup>Of note, interest in the trolley problem has received renewed attention with developments in artificial intelligence. Data collection efforts on people’s trolley views inform how computer programmers code driverless

### 3 Design of Experiment

**3.1 Setting** We recruit workers through Amazon Mechanical Turk (MTurk), a labor market intermediary. Three key characteristics allow implementing the experimental design. First, tasks are often done multiple times by different workers for quality-control purposes. Second, bonuses are useful for creating arbitrarily complex contracts. This allows us to vary the treatment across workers. Third, MTurk ensures the same person does not do the same task more than once by preventing unique worker IDs from accepting the same task and preventing users from generating multiple worker IDs by using e-mail addresses, IP addresses, and, in some cases, bank accounts. These measures prevent workers from entering the experiment more than once. Hundreds of thousands of jobs are posted each day. This allows us to present moral trolley problems with different races without subjects inferring that other subjects see different races in their trolley problem or seeing the race of the experimenter, which Cilliers et al. (2015) show can affect the response of subjects. MTurk has received attention for some of its weaknesses—Goodman et al. (2013) found that MTurk participants are less likely to pay attention—but Goodman et al. (2013) and Snowberg and Yariv (2018) nevertheless conclude that MTurk subjects behavior can be similar to other samples, such as those of university students or a representative population sample.

We post a single placeholder task containing a description of the work and a link for workers to follow if they want to participate (Appendix Figure A.1). The subjects are then randomized, via stratification in the order in which they arrived at the job, to one of several treatment conditions. Treatment is not revealed at this early state. All workers see identical instructions (Appendix Figures A.2 and A.3). This is important because attrition after treatment is revealed can affect causal estimates, while attrition before treatment is revealed does not. In all treatment conditions, workers face an identical “lock-in” task in order to minimize differential attrition before the treatment is revealed (Appendix Figures A.4a and A.4b). As lock-in task, subjects transcribe three paragraphs before treatment is revealed.

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cars.

In both the lock-in and the actual task, workers transcribe paragraphs from a Tagalog translation of Adam Smith’s *The Wealth of Nations*. This task is sufficiently tedious that no one is likely to do it “for fun,” and it is sufficiently simple that all market participants can perform it. The source text was machine-translated into Tagalog. Because the workers were not native-Tagalog speakers, this increased variance in the error rate of the transcriptions, thereby providing a more informative measure of work quality. Translating the text also prevented subjects from finding the text elsewhere on the Internet.

The placeholder request at MTurk asks workers to complete 6 paragraphs and states that the payment for the first paragraph is 10 cents and that workers can receive much more in bonuses, including a 50-cent bonus for completing a short survey at the end. A paragraph takes about 100 seconds to enter, so the offered payment of 10 cents per paragraph is equivalent to \$86.40 per day. The federal minimum wage in the United States at the time of this experiment was \$58/day. In India, it depends on the type of work done, although the "floor" for data entry positions appeared at the time of this experiment to be about \$6.38/day.<sup>4</sup> An example paragraph is displayed on the first page of the external hosting site so workers are aware of the high payment before entering the study.

The experiment was run between May 4-12 of 2009. The average time spent was 34 minutes. The total payment to subjects was \$101.

**3.2 Lock-In** Halfway through their task, i.e. after a lock-in task of 3 paragraphs at 10 cents per paragraph, we reveal treatment. This lock-in successfully reduces attrition (defined as having over 500 errors out of a maximum of 507 characters for any paragraph). Of 274 subjects who agreed to start work, 201 completed the lock-in task of 3 paragraphs; of the 201 who saw the first treatment revelation, 180 continued working and answered the survey questions. The 21 attriters are evenly distributed across treatment interactions (there are 3 treatment groups, so there are 8 treatment interactions) as shown in the lower half of Table 1. Pre-Treatment attrition in Table 1 is attrition that occurs before workers see whether

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<sup>4</sup>Pay-scale, Salary Snapshot for Data Entry Operator Jobs, [http://www.payscale.com/research/IN/Job=Data-Entry\\_Operator/Salary?](http://www.payscale.com/research/IN/Job=Data-Entry_Operator/Salary?), accessed June 17, 2011.

they are in the tournament-based or individual-based compensation. Pre-Treatment attrition does not affect causal estimates. Pre-Trolley attrition is attrition that occurs after workers see whether they are in the tournament-based or individual-based compensation but before answering the trolley problem. While the lock-in task may have independent effects, the lock-in task is identical across treatment groups and, as a separate study shows, does not have independent effects on the outcome (Chen and Horton 2014).

**3.3 Treatments** Treatments are interacted with each other rendering a 2x2x2 experimental design (Figure 2). Each stratification yielded roughly 90 workers. Our main treatment condition is as follows. In one stratification, for paragraphs 4–6, workers either continue entering paragraphs for a piece-rate of 10 cents per paragraph or are placed in a tournament condition. In the tournament, workers are randomly matched with two other workers who were also assigned the tournament condition. Of the three, whoever submits the most accurate transcription receives 30 cents for each paragraph, while the rest receive nothing. Thus, the expected value of the task to the worker stays the same (30 cents for 3 paragraphs), but the competitiveness factor is raised. Accuracy is measured using the Levenshtein distance, a commonly used measure of difference in computer science. The Levenshtein distance is the minimum number of operations needed to transform one string into another: “operation” is defined as an insertion, deletion, or substitution of a single character (Levenshtein 1966).

After workers complete data entry, we administer the moral trolley problem. In our second stratification, we ask either the Bystander version of the moral trolley problem (no italics are used in the experiment, and the language in the scenarios are standard):

A runaway trolley is hurtling down the tracks toward five people who will be killed if it proceeds on its present course. You can save these five people **by *diverting the trolley onto a different set of tracks, one that has only one person on it***, but if you do this that person will be killed. Is it morally permissible to turn the trolley and thus prevent five deaths at the cost of one?

or the Footbridge version of the moral trolley problem:

A runaway trolley is hurtling down the tracks toward five people who will be killed if it proceeds on its present course. You are standing next to a large man on a footbridge spanning the tracks. The only way to save the five people is *to push the man off the footbridge and into the path of the trolley*, but if you do that, the large man will be killed. Is it morally permissible to push the man off the bridge?

Roughly speaking, these two dilemmas are used to explore the morality of acting passively or actively in a moral situation such as the trolley problem. The second scenario is particularly useful for detecting deontological commitments because it requires the act of pushing someone to his death.

Workers in our study respond to the moral trolley problem in roughly the same way people do in other studies. The basic pattern that the bystander scenario increases deontological choices is found in our data as well: people are much less inclined to push someone to his death to save five others than divert the trolley to kill one to save five others. As shown in Table 1, the percentage of workers making the utilitarian choice is higher for the bystander scenario (80%) than for the footbridge scenario (31%). Among the 200,000 individuals who have taken the moral trolley problem (Miller 2008), 80% is also the percentage of subjects who make the utilitarian choice in the bystander scenario, while 30% is the percentage of subjects who make the utilitarian choice in the footbridge scenario (Copp 2010; Appiah 2008; Prinz 2007; Greene et al. 2010). Moreover, consistent with research on the universal moral grammar, demographic characteristics are not predictive of decisions in the moral trolley problem.

Our third stratification modifies the picture that accompanies the moral trolley problem. All the persons being saved or sacrificed are colored to appear light-skinned or dark-skinned (see Appendix Figure A.5 for the full set of illustrations that accompany the moral trolley problem). We vary skin color to investigate where people draw the line between in-groups and out-groups and whether competition makes them more utilitarian regarding out-group members.

Following the trolley problem, we ask workers whether they are willing to donate ten cents of their earnings to the Red Cross or the Red Crescent (Appendix Figure A.6). We then ask for demographic characteristics (Appendix Figure A.7), including gender, age, country (the categories in the subsequent regressions are the United States and India, and the omitted category is other), religion (the categories in the subsequent regressions are: Christian, Hindu, Muslim, and Atheist, and the omitted category is other<sup>5</sup>), frequency of religious attendance (never, once a year, once a month, once a week, or multiple times a week; these are coded as 0-4), and ethnicity (White, Black, Hispanic, Asian/Pacific Islander<sup>6</sup>, or Native American<sup>7</sup>).

Using self-reported ethnic identity is imperfect. We explore the extent to which this is a problem for workers from India, where skin color varies dramatically and self-identification for skin color may be more accurate than coding “Asian/Pacific Islander” as non-White. For the small subset of workers whose IP addresses can be traced to a geographic location, we recode Asians as White or non-White depending on the predominant skin tone in the region. The results that follow strengthen slightly with this recoding. We also find that some workers in India self-identify as White or Black, so it is possible that workers are actually reporting their self-perceived skin color. To the extent individuals are categorized based on their self-reported identity, the experiment is actually capturing a sense of self for in-group vs. out-group members. Moreover, if self-reports are leading to gross mis-measurements, all the results of the other-regarding preferences tests that follow would be underestimated. Furthermore, priming individuals with the skin tone of the illustration increased charitable donations when the skin tone matched their self-reported identity. For the remainder of the discussion we drop the adjective “self-reported”.

In a control experiment, we measure the baseline. This control experiment asks workers to enter one paragraph and then immediately answer the moral trolley dilemma.

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<sup>5</sup>These include Jewish, Buddhist, Sikh, Agnostic, Transcendentalism, and prefer not to answer.

<sup>6</sup>The omitted race category is Asian in the analyses that include White, Black, and Hispanic.

<sup>7</sup>There are no Native Americans in the study.

**3.4 Balance** Demographic characteristics are balanced across treatment groups, consistent with the randomization of workers across treatment. Table 1 displays summary statistics by treatment interaction. Males comprise 41% of the sample. 46% and 36% are from the United States and India respectively. 32% are Christian, 30% are Hindu, 24% are atheist, and 4% are Muslim. The average age is 30. The average religious attendance is between once a year and once a month. 53% are White, 39% are Asian/Pacific Islander, 5% are Black, and 5% are Hispanic.<sup>8</sup> After work has been completed, according to the original expiry date listed, bonuses are calculated and workers are notified of their earnings. To avoid the potential confound that self-knowledge may impart, tournament winners and losers *do not know their status as a winner or loser* at the time they are queried about their normative commitments.

**3.5 Specification** In the basic specification, we examine the effect of one treatment stratification at a time: *Tournament* versus *Individual-based* compensation, *Bystander* versus *Footbridge scenario*, and *Light* versus *Dark Illustration* of the moral trolley problem. Our 2x2x2 experimental design allows us to investigate heterogeneous treatment effects, so we can interact treatments with each other (e.g., *Tournament* with *Footbridge scenario* or with *Dark Illustration*) in order to investigate the effect of tournament-based compensation on other-regarding preferences. Because of the random assignment of workers to treatment conditions, the treatment effects will be unbiased, but including demographic controls will be more efficient and reduce the standard errors of the treatment effect being considered if the controls are significant predictors of the outcome variable. For instance, since the *Footbridge scenario* strongly negatively predicts the *Utilitarian* choice, *Footbridge scenario* will always be controlled for when predicting *Bystander* even when *Footbridge scenario* is not the treatment of interest in the analyses below. All results are presented in bar charts as well as regressions for ease of interpretation.

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<sup>8</sup>Most workers have a college education and the income distribution of workers follows the income distribution in the U.S. (<http://behind-the-enemy-lines.blogspot.com/2008/03/mechanical-turk-demographics.html>).

## 4 Results

**4.1 The Effect of Tournaments on Utilitarian Values** Tournament-based compensation increases deontological commitments, particularly in the footbridge scenario. This finding can be seen in Figure 3, which displays for each treatment interaction the percentage of workers making utilitarian choices in the moral trolley problem (the red Xs mark the baseline: how workers make utilitarian choices in the absence of treatment in the control experiment where workers enter one paragraph and then immediately answer the moral trolley dilemma).<sup>9</sup>

In the tournament setting, 38 out of 44 workers (86%) chose not to push someone to his death to save five others. With individual-based compensation, 26 out of 49 workers (53%) decided the same. Competition increases deontological commitments even when controlling for demographic characteristics. Table 2 displays estimates of the specification:

$$(1) \quad Utilitarian_i = \beta_0 + \beta_1 Tournament_i + \beta_2 FootbridgeScenario_i + \beta_3 Tournament_i \times FootbridgeScenario_i + \beta_4 X_i + \varepsilon_i$$

where  $\beta_3$  is the coefficient of interest. Marginal effects from probit regressions give similar results (compare Columns 5 with 7, and 6 with 8).<sup>10</sup> Workers responding to the footbridge scenario are over 50% less likely to make the utilitarian choice than workers responding to the bystander scenario (Column 1). Overall, stratifying only by market experience, tournament workers are 14% less likely to make the utilitarian choice than non-tournament workers (Column 2). Controlling for the footbridge scenario, other treatments, and demographic characteristics strengthens the impact of tournament-based compensation on utilitarian values

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<sup>9</sup>The sample size in the control experiment is 89. The summary statistics are as follows:

1.  $Pr \{Util|Bystander, Dark\} = 0.944$
2.  $Pr \{Util|Bystander, Light\} = 0.710$
3.  $Pr \{Util|Footbridge, Dark\} = 0.250$
4.  $Pr \{Util|Footbridge, Light\} = 0.211$

Only two workers did not answer the moral dilemma, conditional on seeing the moral trolley problem.

<sup>10</sup>Marginal effects from probit regressions give quantitatively similar estimates in all subsequent models and therefore will not be discussed further here.

(Columns 3 and 5). Including an interaction between the tournament treatment and the footbridge scenario treatment (Column 8) indicates that workers are 46% less likely to choose the utilitarian option in the footbridge scenario than in the bystander scenario, but tournament workers are an additional 38% less likely to make the utilitarian choice in the footbridge scenario than non-tournament workers. Comparable estimates for  $\beta_3$  are found in Columns 4 and 6 and they are statistically significant at the 5% or 1% level. This result highlights the central finding that tournament compensation increases deontological commitments, particularly in the footbridge scenario.

#### 4.2 The Effect of Tournaments on Differential in-group, out-group Moral Preferences

We find some evidence that the kind of market experiences affects whether subjects have differential in-group, out-group moral views and whether those views are shaped by their incentive treatment. To investigate whether market experiences increase utilitarian commitments towards out-groups, we estimate the following specification:

$$\begin{aligned}
 \text{(2)} \quad \text{Utilitarian}_i &= \beta_0 + \beta_1 \text{White}_i + \beta_2 \text{DarkIllustration}_i + \beta_3 \text{Tournament}_i + \\
 &\beta_4 \text{White}_i \times \text{DarkIllustration}_i + \beta_5 \text{White}_i \times \text{Tournament}_i + \\
 &\beta_6 \text{DarkIllustration}_i \times \text{Tournament}_i + \beta_7 \text{White}_i \times \text{DarkIllustration}_i \times \\
 &\text{Tournament}_i + \beta_8 X_i + \beta_9 \text{FootbridgeScenario}_i + \varepsilon_i
 \end{aligned}$$

One coefficient of interest is  $\beta_4$ , which captures whether Whites are more likely to make the utilitarian choice when presented with a dark illustration of the moral trolley problem (as compared to non-Whites and as compared to being presented with the light illustration). The second coefficient of interest is  $\beta_7$ , which captures whether tournament-based compensation increases utilitarian commitments towards out-groups. Table 3 illustrates White workers in individual-based compensation are 38% more likely than non-White workers to make the utilitarian choice when presented a dark-skinned illustration, but White workers in the tournament setting are 24% less likely to make the utilitarian choice when presented a dark-skinned illustration (0.384 – 0.627 in Column 6).<sup>11</sup> Estimates for  $\beta_7$  are statistically significant

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<sup>11</sup>The estimated effects from Column 6 are as follows:

at the 1% or 10% level and comparable across Columns 2, 4, and 6. This effect is shown in Figure 4 to come more strongly from non-Whites (47% of the sample).<sup>12</sup> The fifth and seventh bar indicate that non-Whites particularly become more deontological towards out-group members (light illustration) with tournament-based compensation. Note that the effects in the visual display of the raw data are not as strong as those in the table because the footbridge scenario, which is highly predictive of the *Utilitarian* choice, is not controlled for. Moreover, from both the visual display and the table, one can observe that workers are somewhat more utilitarian towards out-groups.<sup>13</sup> Thus far, the results indicate that tournament workers display more deontological commitments and more deontological commitments towards out-groups than do non-tournament workers.

**4.3 The Effect of Tournaments on Charitable Donations** The decision to donate is also affected by the market experience. Workers in the tournament setting are about 15% less likely to donate to the Red Cross or Red Crescent (Table 4), as can be seen from estimating:

$$(3) \quad Donate_i = \beta_0 + \beta_1 Tournament_i + \beta_2 X_i + \varepsilon_i$$

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1.  $Pr \{Util|White, Dark, PR\} - Pr \{Util|White, Light, PR\} = -.233 + .384 = .151$
  2.  $Pr \{Util|Non - White, Light, PR\} - Pr \{Util|Non - White, Dark, PR\} = .233$
  3.  $Pr \{Util|White, Dark, T\} - Pr \{Util|White, Light, T\} = -.233 + .384 + .515 - .627 = .039$
  4.  $Pr \{Util|Non - White, Light, T\} - Pr \{Util|Non - White, Dark, T\} = .233 - .515 = -.282$ 
    - 1+2 = .384 and 3+4 = .384-.627 = -.243 (DD: whites to non-whites)
    - 3-1 = -.112 and 4-2 = -.515 (DD: tournament vs. individual-based compensation)

<sup>12</sup>The Red Xs again indicate the baseline. They suggest that tournament-based compensation had a strong effect in increasing deontological commitments towards out-groups for non-white workers. The summary statistics from the control experiment described in the previous section are as follows:

1.  $Pr \{Util|Non - White, Dark\} = 0.522$
2.  $Pr \{Util|Non - White, Light\} = 0.553$
3.  $Pr \{Util|White, Dark\} = 0.579$
4.  $Pr \{Util|White, Light\} = 0.417$

<sup>13</sup>The coefficient on the interaction term between *White* and *Dark Illustration* displays this relationship in Table 3. From the previous discussion of Column 6 in footnote 15, 1+3 indicate how much more utilitarian Whites are in the dark illustration and 2+4 indicate how much more utilitarian non-Whites are in the light illustration.

An important outcome to study in the effect of markets on morality, moreover, is the behavior of market winners, as their behavior may be more likely to persist in an efficient market. Tournament winners are more likely to donate to charity. Table 5 presents estimates of the specification:

$$(4) \quad \text{Donate}_i = \beta_0 + \beta_1 \text{Winner}_i + \beta_2 X_i + \varepsilon_i$$

where  $\beta_1$  is the coefficient of interest. We restrict to the sample of individuals in the tournament treatment. The average donation rate is 46%, so the coefficient of 0.26 in Column 3 and comparable estimates of  $\beta_1$  in Columns 1 and 2 represent about 50% of the overall donation rate and are statistically significant at the 5% level.<sup>14</sup> These findings are consistent with the theory that competition fosters empathy, not among the competitors, but between competitors and third parties, (the beneficiary of donations in our study is the Red Cross / Red Crescent, not other participants in the experiment, at least for tournament winners).<sup>15</sup>

Do tournament winners donate more in the forgoing analysis because productive workers are more generous or because tournament-based compensation caused productive workers to become more generous? As falsification check, we examine the behavior of workers who would have been tournament winners but were assigned to the non-tournament condition. Table 6 repeats the analyses of Table 5 but compares these ‘placebo’ winners and losers in the non-tournament condition. The winners and losers are calculated by comparing with other workers assigned to individual-based compensation. Columns 1-3 of Table 6 show that these ‘placebo’ winners, when not told they are in a tournament, do not donate more in a statistically significant manner and the point estimates are half the size of those in Table 5. Figure 5 graphically displays the differences-in-differences analysis of the effect of tournament-based compensation on charitable donations by tournament winners. Moreover, in the control experiment, the relationship between log error rate and donation is small and slightly positive with a t-statistic of 0.87. Assuming that the tournament treatment does

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<sup>14</sup>Another study also found that tournament winners donate more (Kidd et al. 2013).

<sup>15</sup>Tournament winners are slightly but not significantly more deontological (Columns 4-6 of Table 5).

not affect the order of productivity among workers, these results suggest that tournament-based compensation caused productive workers to become more generous. These results are consistent with the evidence that individuals in more market-oriented countries tend to be more charitable (Alesina and Glaeser 2004).

#### 4.4 The Effect of Tournaments on Utilitarian Values over Market Development

An important distinction between the labor market intermediary in our study and the laboratories in experimental economics studies is the global labor supply, allowing the exploration of heterogenous treatment effects, in this application, the intellectual history of the *doux commercethesis*. In the early stages of market development, economists thought that commerce increased morality, but in the later stages of market development, economists thought that commerce decreased morality (Hirschman 1982). To explore whether the effect of tournament-based compensation on utilitarian values changes for workers from high-income countries, Table 7 displays estimates of the specification:

$$(5) \quad Utilitarian_i = \beta_0 + \beta_1 Tournament_i + \beta_2 LnGDP_i + \beta_3 Tournament_i \times LnGDP_i + \beta_4 X_i + \beta_5 FootbridgeScenario_i + \varepsilon_i$$

where  $\beta_3$  is the coefficient of interest. Income data is obtained from the World Economic Outlook Database (IMF 2009).<sup>16</sup> As documented above, for the entire sample, exposure to individual-based compensation makes workers 17% more utilitarian (Column 1 of Table 3), but interacting market treatment with the income of the worker’s country reveals that the effect of tournament-based compensation on increasing deontological values reverses with income, which is consistent with the intellectual history of the *doux commerce* thesis whereby markets increase morality for poorer countries. To interpret the estimates of  $\beta_3$  in Columns 2-5, around the mean level of Ln GDP PPP per capita, 9.54 (shown in Table 1), the effect of tournament-based compensation on utilitarian commitments reverses. This reversal is statistically significant at the 5% or 10% level and robust to using a threshold measure of income, e.g., splitting the sample roughly in half where high income is defined as GDP PPP per capita

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<sup>16</sup><http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx>

above 30,000.<sup>17</sup> The estimates of  $\beta_3$ , however, should be considered cautiously. Although the moral trolley problem is culturally neutral (Mikhail 2007), and although we designed the transcription task to be culturally neutral as well, correlates of income could explain this reversal and also explain Hirschman (1982)’s observations.<sup>18</sup> The effect of tournament-based compensation on donations also reverses with income and becomes negative at the highest income levels (Columns 6-10). As to why workers from countries at different stages of market development may respond differently, the distance between individual effort and pay is correlated with unhappiness (see, e.g., DeVoe and Pfeffer 2009), which can cause deontological responses to moral judgments (Wheatley and Haidt 2005; Schall et al. 2008). As markets develop, however, markets become perceived as fair or, at least, unsurprising as a reference point (Kahneman et al. 1986). This perspective provides an economic rationale for the changing views towards the *doux commerce* thesis.

**4.5 Limitations** In the experiment, tournament-based compensation increases deontological values, increases deontological values towards out-groups, and increases donations among productive workers relative to non-productive workers. The online appendix considers several limitations and alternative interpretations for these findings. The main limitation is that the briefness of the study makes it more akin to a priming experiment (see, e.g., Benjamin et al. (2010) arguing that the priming of social identity helps examine the causal effect of social identity on preferences). We do not know whether market experience has long-term effects on normative commitments once an individual is removed from that market environment. Also, the results on donation perhaps provide some information about selfishness vs. altruism, which would be relevant to the *doux commerce* thesis, but it is not clear what to make of them because donations of tournament winners and losers are ranked in opposite ways relative to subjects in the non-tournament condition.

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<sup>17</sup>Bahrain, Canada, France, Germany, Netherlands, Switzerland, and the United States are High Income countries. Argentina, Bahamas, Bolivia, Bulgaria, Egypt, Honduras, India, Israel, Macedonia, Malaysia, Morocco, Philippines, Romania, Serbia, Turkey, and Zambia are Low Income countries.

<sup>18</sup>When dummy variables for being American and being Indian are also interacted with market experience,  $\beta_3$  weakens in statistical significance.

## 5 Conclusion

At its largest theoretical scale, this paper interrogates the *doux commerce* thesis. Specifically, we test a key component of the thesis—that one’s experience with market incentives can shape one’s views of what constitutes right and wrong in social interactions. We find that workers randomized to tournament-based compensation displayed greater deontological commitments compared to workers randomized to individual-based compensation. To the extent that legal theorists and moral philosophers skeptical of markets have been concerned about the negative effects of market interactions on interpersonal social norms as guided by deontological commitments, these results suggest that, depending on levels of income in a given context, there may be less reason for concern with regard to market competition than previously thought.

Our results suggest that, in studying the theoretical and empirical effects of market experiences, the type of compensation received is significant, affecting differential in-group, out-group perceptions and charitable donations. Workers who are assigned to individual-based compensation become more utilitarian towards out-groups, while workers who are assigned to tournament-based compensation become more deontological towards out-groups. Additionally, tournament-based compensation increases productivity and causes tournament winners to make more charitable donations.

The effect of tournament-based compensation on deontological commitments reverses with increasing levels of income in the worker’s country of residence. This reversal suggests that the manner in which market forces shape normative commitments may be contingent on context. This differential effect is consistent with shifting theorizations of the *doux commerce* thesis over its history. During the 1700s, as markets developed, scholars theorized that markets had positive effects on moral virtue. As market development progressed, scholars later came to theorize that markets had negative effects on interpersonal relations and ethics. Psychologists have documented that negative emotions cause deontological responses and positive emotions generate utilitarian responses. Tournaments may be viewed as un-

fair in early stages of market development and thereby trigger negative emotions and deontological commitments. As markets develop more fully and associated moral norms are internalized by participants, competition comes to be perceived as fair and triggers positive emotions and utilitarian commitments. The promoting effects of market competition on others-regarding moral values may be particularly strong in contexts with less established markets and market-associated ideas of value and social relations; this hypothesis is consistent with earlier studies that have found greater cooperation in experimental games in developing societies with greater market integration. This may be because market interaction in less market-developed contexts are interpreted by market participants through non-market systems of meaning and value such that market interactions serve to stimulate and reinforce deontological commitments to others.

Although more specific empirical studies should be pursued in the future to test these hypotheses, our results may have broad implications for regulation in high-income market economies in which economic inequality is widely regarded as an increasing problem for social cohesion and the legitimacy of existing political-economic systems. Extrapolation from our findings, for example, suggests that restricting bonuses of financiers—a topic of great public interest following the financial crises of 2007-2009 that were widely viewed to have been set in motion by irresponsible market behaviors—may make them more deontological and duty-oriented, which may in turn alter how wealthy individuals and corporations with significant influence engage with political processes in relation to labor conditions for their employees, welfare, wider regulation, and taxation (Sandel 2010).

In what may now be an era of partial retreat from globalization and increasing nationalist sentiment, the *doux commerce* thesis is rarely promoted as a central, explicit justification for capitalist market expansion and market deregulation. It has nonetheless played a key role in shaping modern political economy and the colonial and postcolonial paradigms of economic development and structural adjustment that continue to exercise great influence over the contemporary world, and several of its assumptions remain embedded in international finan-

cial institutions whose mandate is to hasten market development in postcolonial nations. Our results suggest that interrogating and empirically testing the claims of the *doux commerce* thesis may be significant not only as a matter of theory but also for addressing several of the most pressing economic and political concerns at issue in both wealthy and poor nations, such as the role of state regulation of markets, the structure of labor incentives, and the social consequences of growing economic inequality along with rationales for its curtailment.

In the context of experimental social research that can often overlook the sociopolitical roots of the phenomena it tests, it should also be noted that our study reflects the fact that neither markets nor morality—the twinned themes of our analysis—should be regarded as natural phenomena. As influential historians and theorists from Karl Marx, Friedrich Nietzsche, and Max Weber to Karl Polanyi, Michel Foucault, and Thomas Piketty, for example, have noted, both morality and markets are historically contingent and are the products of political contestation and power. Such thinkers, among others, have argued that markets and morality are the interlocked cornerstones of liberal-capitalist, and later neoliberal, ideology—that is, systems of belief that present particular interested claims (e.g., what is good/bad; what constitutes value and who/what has or does not have value) as matters of natural, universal truth and then construct ramifying interpretations of the world and prescriptions for proper behavior on the basis these supposed truths. Our analysis reflects that market conditions and their interrelation with morality are both highly consequential for social life and also highly manipulable. Our findings suggest that, given the deep social consequences of markets that shape moral attitudes, assuming responsibility for the politically determined conditions and parameters of market interactions should be a central task of governance in order to ensure a distribution of wealth, labor, and responsibility that is compatible with sustaining human life, planetary health, and social cohesion.

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FIGURE 1.— Experimental Design

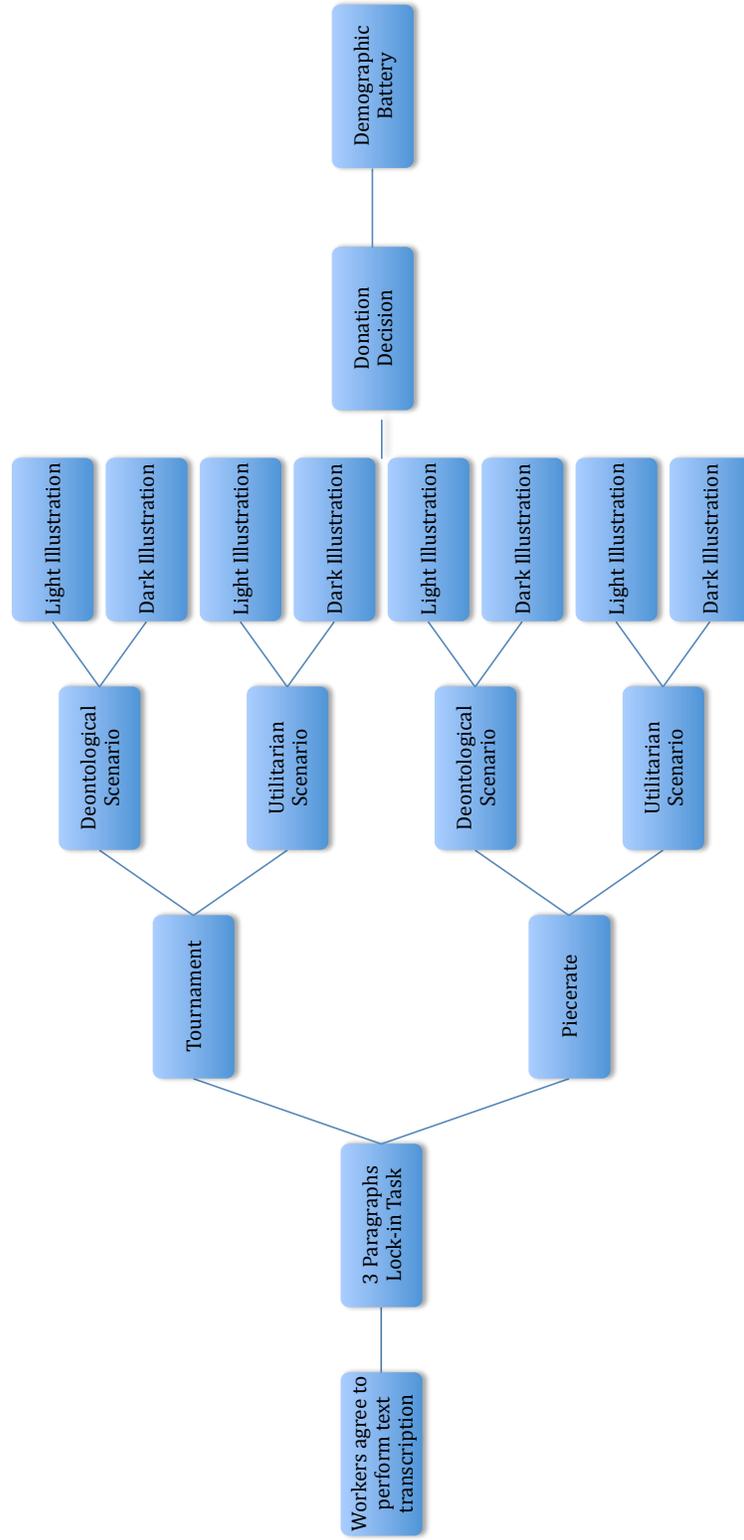


FIGURE 2.— The Effect of Tournament-based Compensation on Deontological Commitments

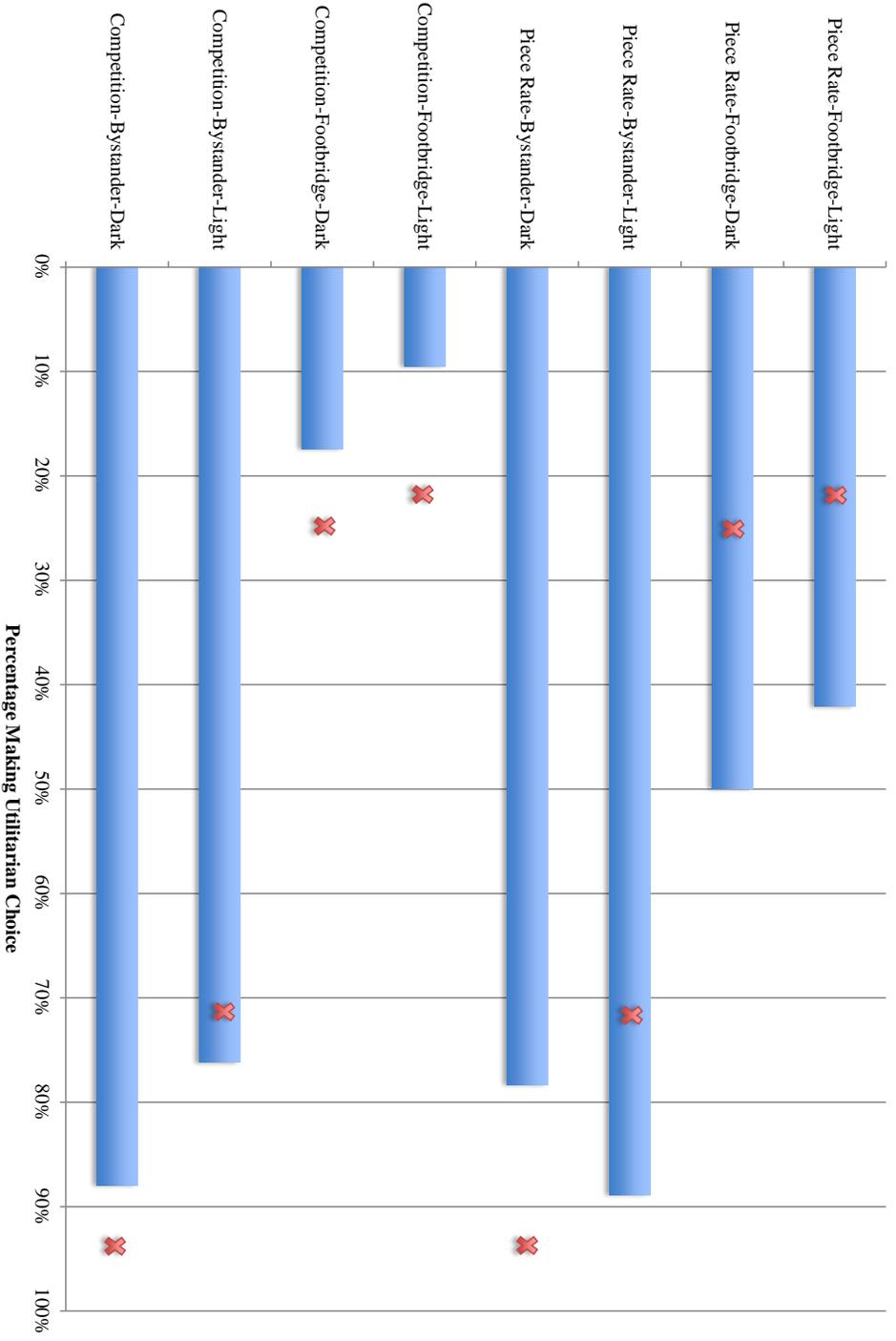


FIGURE 3.— The Effect of Tournament-based Compensation on Other-Regarding Preferences

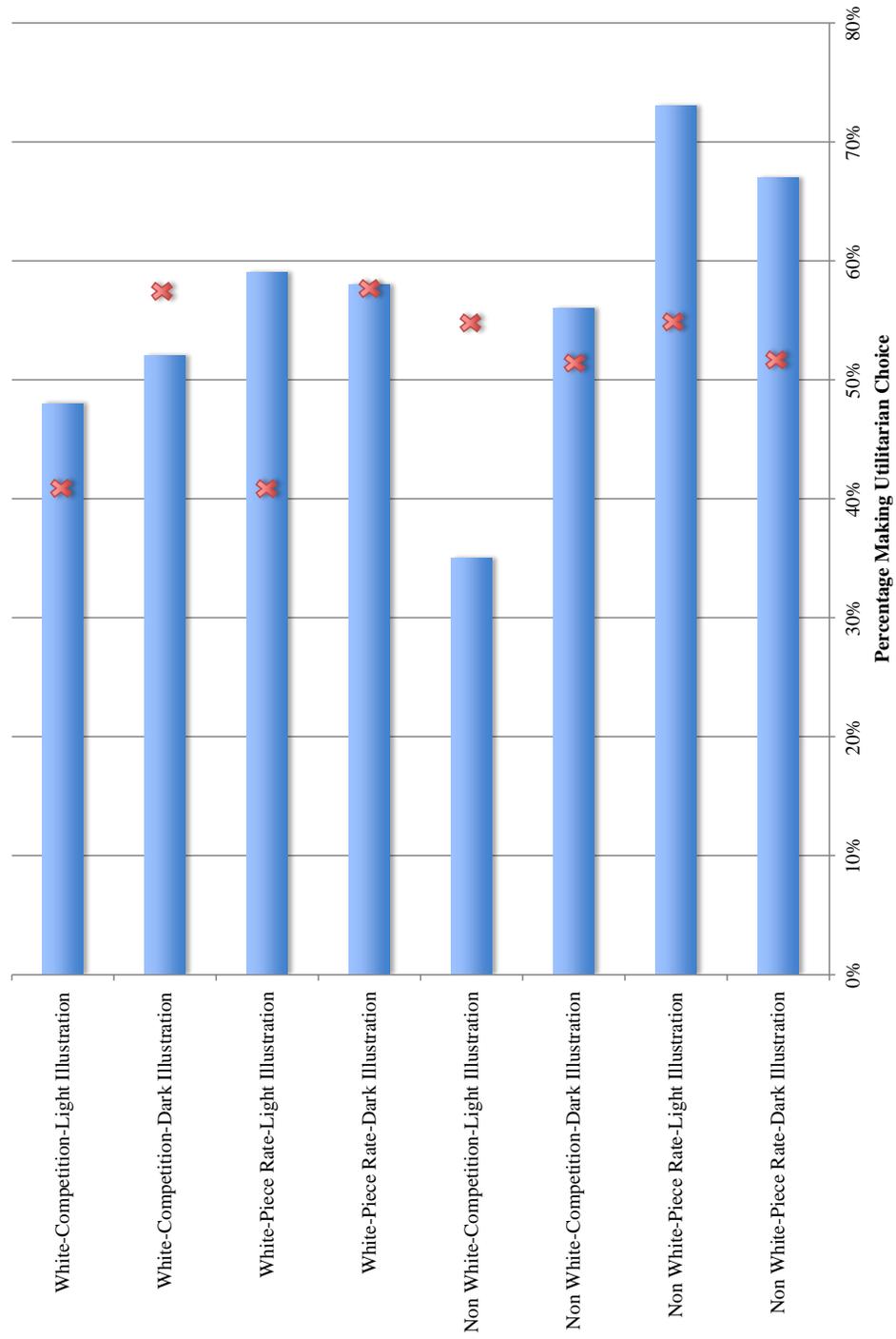


FIGURE 4.— The Effect of Tournament-based Compensation on Charitable Donations

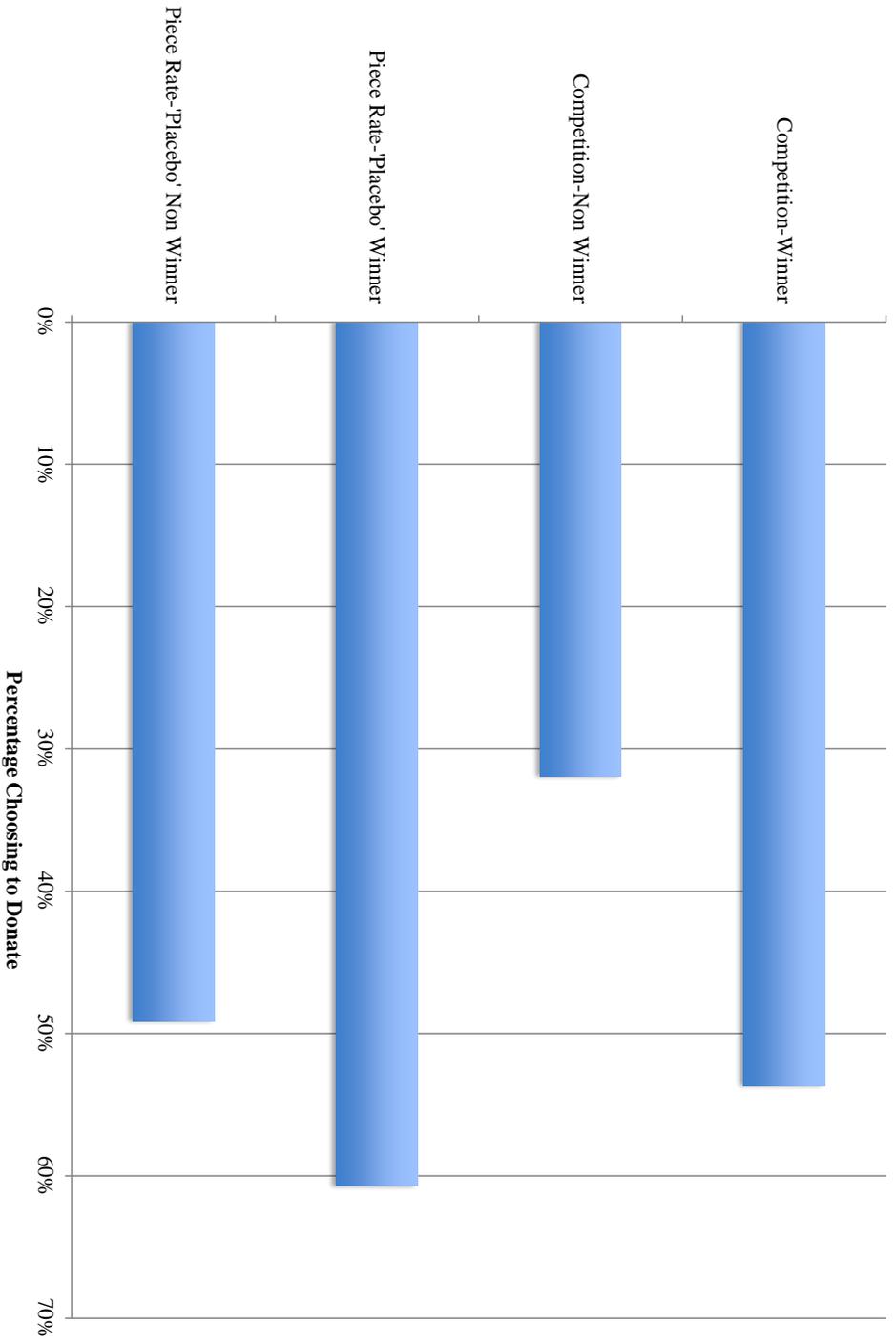


TABLE I  
SUMMARY STATISTICS

<b>Contract: Scenario: Illustration:</b>	Competition				Piece-Rate				Total (9)
	Bystander		Footbridge		Bystander		Footbridge		
	Dark (1)	Light (2)	Dark (3)	Light (4)	Dark (5)	Light (6)	Dark (7)	Light (8)	
Utilitarian	0.880 (0.332)	0.762 (0.436)	0.174 (0.388)	0.0952 (0.301)	0.783 (0.422)	0.889 (0.323)	0.500 (0.509)	0.421 (0.507)	0.561 (0.498)
Donate	0.480 (0.510)	0.381 (0.498)	0.391 (0.499)	0.381 (0.498)	0.522 (0.511)	0.667 (0.485)	0.433 (0.504)	0.474 (0.513)	0.461 (0.500)
Male	0.400 (0.500)	0.333 (0.483)	0.435 (0.507)	0.333 (0.483)	0.304 (0.470)	0.444 (0.511)	0.500 (0.509)	0.526 (0.513)	0.411 (0.493)
Age	32.36 (12.81)	29.57 (10.63)	28.96 (8.839)	31.71 (11.47)	30.22 (11.30)	31.56 (12.67)	27.20 (7.063)	29.32 (8.512)	29.99 (10.40)
American	0.400 (0.500)	0.429 (0.507)	0.478 (0.511)	0.476 (0.512)	0.478 (0.511)	0.500 (0.514)	0.500 (0.509)	0.368 (0.496)	0.456 (0.499)
Indian	0.280 (0.458)	0.286 (0.463)	0.435 (0.507)	0.286 (0.463)	0.348 (0.487)	0.222 (0.428)	0.467 (0.507)	0.474 (0.513)	0.356 (0.480)
Christian	0.440 (0.507)	0.381 (0.498)	0.478 (0.511)	0.333 (0.483)	0.304 (0.470)	0.111 (0.323)	0.267 (0.450)	0.211 (0.419)	0.322 (0.469)
Hindu	0.240 (0.436)	0.190 (0.402)	0.304 (0.470)	0.190 (0.402)	0.348 (0.487)	0.167 (0.383)	0.433 (0.504)	0.474 (0.513)	0.300 (0.460)
Muslim	0.0400 (0.200)	0.0476 (0.218)	0.0435 (0.209)	0.0476 (0.218)	0 (0)	0.111 (0.323)	0.0333 (0.183)	0.0526 (0.229)	0.0444 (0.207)
Atheist	0.240 (0.436)	0.286 (0.463)	0.174 (0.388)	0.143 (0.359)	0.261 (0.449)	0.500 (0.514)	0.200 (0.407)	0.158 (0.375)	0.239 (0.428)
Religiousness	1.080 (0.997)	1.667 (1.426)	1.783 (1.242)	1.857 (1.389)	1.435 (1.532)	1.389 (1.461)	1.267 (1.337)	1.895 (1.449)	1.522 (1.356)
White	0.520 (0.510)	0.619 (0.498)	0.435 (0.507)	0.571 (0.507)	0.435 (0.507)	0.722 (0.461)	0.533 (0.507)	0.474 (0.513)	0.533 (0.500)
Black	0.0400 (0.200)	0.0476 (0.218)	0.0435 (0.209)	0.0476 (0.218)	0.0870 (0.288)	0.0556 (0.236)	0 (0)	0.105 (0.315)	0.0500 (0.219)
Hispanic	0.0400 (0.200)	0.0476 (0.218)	0 (0)	0.0476 (0.218)	0.0435 (0.209)	0.167 (0.383)	0.0667 (0.254)	0 (0)	0.0500 (0.219)
Asian	0.400 (0.500)	0.286 (0.463)	0.522 (0.511)	0.381 (0.498)	0.435 (0.507)	0.167 (0.383)	0.433 (0.504)	0.421 (0.507)	0.389 (0.489)
Log GDP PPP per capita	9.609 (1.275)	9.829 (1.241)	9.454 (1.370)	9.708 (1.257)	9.579 (1.341)	9.688 (1.239)	9.383 (1.382)	9.113 (1.402)	9.541 (1.308)
Observations	25	21	23	21	23	18	30	19	180
Pre-Treatment Attrition	0.212 (0.415)	0.226 (0.425)	0.289 (0.460)	0.242 (0.435)	0.278 (0.454)	0.312 (0.471)	0.244 (0.435)	0.333 (0.479)	0.266 (0.443)
Pre-Trolley Attrition	0.242 (0.435)	0.290 (0.461)	0.421 (0.500)	0.424 (0.502)	0.306 (0.467)	0.438 (0.504)	0.293 (0.461)	0.367 (0.490)	0.347 (0.477)
Observations	33	31	38	33	36	32	41	30	274

TABLE II  
THE EFFECT OF TOURNAMENT-BASED COMPENSATION ON UTILITARIAN VALUES

	Ordinary Least Squares				Probit			
	(1) Utilitarian	(2) Utilitarian	(3) Utilitarian	(4) Utilitarian	(5) Utilitarian	(6) Utilitarian	(7) Utilitarian	(8) Utilitarian
Footbridge Scenario	-0.516*** (0.0636)		-0.525*** (0.0625)	-0.360*** (0.0871)	-0.549*** (0.0642)	-0.387*** (0.0892)	-0.608*** (0.0660)	-0.464*** (0.106)
Tournament		-0.144* (0.0736)	-0.174*** (0.0625)	-0.00318 (0.0884)	-0.155** (0.0657)	0.00914 (0.0909)	-0.220** (0.0906)	-0.0105 (0.137)
Tournament * Footbridge Scenario				-0.330*** (0.123)		-0.318** (0.124)		-0.379** (0.164)
Dark Illustration					0.0880 (0.0669)	0.0890 (0.0658)	0.113 (0.0938)	0.118 (0.0954)
Demographic Controls	N	N	N	N	Y	Y	Y	Y
Observations	180	180	180	180	180	180	180	180
R-squared	0.021	0.270	0.300	0.328	0.373	0.398		

Notes: Standard errors in parentheses. The dependent variable is the utilitarian choice to sacrifice one individual to save five others. The independent variables of interest are the treatments, a dummy indicator for the footbridge as opposed to bystander scenario of the trolley problem, whether the subject had individual-based or tournament-based compensation that depends on the accuracy of data transcription, and whether the trolley scenario had light or dark-skinned individuals being sacrificed. Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE III  
THE EFFECT OF TOURNAMENT-BASED COMPENSATION ON UTILITARIANISM TOWARDS OUT-GROUPS

	Ordinary Least Squares			Probit		
	(1) Utilitarian	(2) Utilitarian	(3) Utilitarian	(4) Utilitarian	(5) Utilitarian	(6) Utilitarian
Footbridge Scenario	-0.521*** (0.0641)	-0.539*** (0.0631)	-0.551*** (0.0657)	-0.568*** (0.0643)	-0.586*** (0.0657)	-0.639*** (0.0664)
White	-0.0759 (0.0985)	-0.281** (0.141)	0.0889 (0.123)	-0.185 (0.161)	0.115 (0.162)	-0.278 (0.217)
Dark Illustration	0.0453 (0.0962)	-0.146 (0.135)	0.0756 (0.0971)	-0.142 (0.136)	0.0954 (0.128)	-0.233 (0.185)
White * Dark Illustration	0.0175 (0.130)	0.244 (0.182)	0.0155 (0.131)	0.276 (0.183)	0.0284 (0.172)	0.384** (0.190)
Tournament		-0.454*** (0.148)		-0.504*** (0.152)		-0.678*** (0.150)
White * Tournament		0.382** (0.192)		0.464** (0.198)		0.555*** (0.146)
Dark Illustration * Tournament		0.348* (0.188)		0.402** (0.190)		0.515*** (0.156)
Dark Illustration * Tournament * White		-0.428* (0.255)		-0.502* (0.257)		-0.627*** (0.144)
Demographic Controls	N	N	Y	Y	Y	Y
Observations	180	180	180	180	180	180
R-squared	0.278	0.326	0.336	0.385		

Notes: Standard errors in parentheses. The dependent variable is the utilitarian choice to sacrifice one individual to save five others. The independent variables of interest are the treatments, a dummy indicator for the footbridge as opposed to bystander scenario of the trolley problem, whether the subject had individual-based or tournament-based compensation that depends on the accuracy of data transcription, and whether the trolley scenario had light or dark-skinned individuals being sacrificed. Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE IV  
THE EFFECT OF TOURNAMENT-BASED COMPENSATION ON CHARITABLE DONATIONS

	Ordinary Least Squares		Probit
	(1)	(2)	(3)
	Donate	Donate	Donate
Tournament	-0.100 (0.0743)	-0.143* (0.0775)	-0.162** (0.0818)
Footbridge Scenario		-0.0664 (0.0757)	-0.0754 (0.0808)
Dark Illustration		0.0101 (0.0789)	0.0125 (0.0845)
Demographic Controls	N	Y	Y
Observations	180	180	180
R-squared	0.010	0.137	

Notes: Standard errors in parentheses. The dependent variable is donation in a charitable decision. The independent variables of interest are the treatments, a dummy indicator for the footbridge as opposed to bystander scenario of the trolley problem, whether the subject had individual-based or tournament-based compensation that depends on the accuracy of data transcription, and whether the trolley scenario had light or dark-skinned individuals being sacrificed. Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE V  
THE BEHAVIOR OF TOURNAMENT WINNERS

	Ordinary Least Squares		Probit	Ordinary Least Squares		Probit
	(1)	(2)	(3)	(4)	(5)	(6)
	Donate	Donate	Donate	Utilitarian	Utilitarian	Utilitarian
Winner	0.216** (0.104)	0.248** (0.116)	0.267** (0.119)	-0.0168 (0.0787)	-0.0354 (0.0891)	-0.0447 (0.147)
Footbridge Scenario		-0.0951 (0.111)	-0.108 (0.114)	-0.689*** (0.0777)	-0.687*** (0.0855)	-0.723*** (0.0802)
Dark Illustration		0.0452 (0.121)	0.0560 (0.124)		0.114 (0.0930)	0.188 (0.150)
Demographic Controls	N	Y	Y	N	Y	Y
Observations	90	90	90	90	90	90
R-squared	0.047	0.159		0.476	0.515	

Notes: Standard errors in parentheses. The dependent variables are the utilitarian choice to sacrifice one individual to save five others and donation in a charitable decision. The independent variable of interest is whether the subject was the winner in tournament-based compensation that depends on the accuracy of data transcription. Controls include treatments, a dummy indicator for the footbridge as opposed to bystander scenario of the trolley problem and whether the trolley scenario had light or dark-skinned individuals being sacrificed. Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE VI  
FALSIFICATION - BEHAVIOR OF 'PLACEBO' WINNERS IN NON-TOURNAMENTS

	Ordinary Least Squares		Probit	Ordinary Least Squares		Probit
	(1)	(2)	(3)	(4)	(5)	(6)
	Donate	Donate	Donate	Utilitarian	Utilitarian	Utilitarian
'Placebo' Winner	0.115 (0.116)	0.111 (0.123)	0.381 (0.364)	-0.136 (0.104)	-0.123 (0.113)	-0.317 (0.404)
Footbridge Scenario		-0.0612 (0.108)	-0.184 (0.326)	-0.361*** (0.0954)	-0.383*** (0.0999)	-1.440*** (0.390)
Dark Illustration		-0.0761 (0.115)	-0.272 (0.337)		0.101 (0.106)	0.272 (0.374)
Demographic Controls	N	Y	Y	N	Y	Y
Observations	90	90	90	90	90	85
R-squared	0.011	0.279		0.155	0.337	

Notes: Standard errors in parentheses. The dependent variables are the utilitarian choice to sacrifice one individual to save five others and donation in a charitable decision. The independent variable of interest is whether the subject assigned to individual-based compensation would have been the winner in tournament-based compensation that depends on the accuracy of data transcription. Controls include treatments, a dummy indicator for the footbridge as opposed to bystander scenario of the trolley problem and whether the trolley scenario had light or dark-skinned individuals being sacrificed. Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE VII  
THE EFFECT OF TOURNAMENT-BASED COMPENSATION ON UTILITARIAN VALUES OVER MARKET DEVELOPMENT

	Ordinary Least Squares			Probit		Ordinary Least Squares			Probit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Utilitarian	Utilitarian	Utilitarian	Utilitarian	Utilitarian	Donate	Donate	Donate	Donate	Donate
Footbridge Scenario	-0.525*** (0.0625)	-0.544*** (0.0613)	-0.554*** (0.0639)	-0.572*** (0.0633)	-0.615*** (0.0658)			-0.0646 (0.0760)		-0.0740 (0.0809)
Tournament	-0.174*** (0.0625)	-1.137** (0.452)	-1.023** (0.491)	-0.929*** (0.123)	-0.900*** (0.182)	-0.100 (0.0743)	0.455 (0.546)	0.121 (0.584)	0.432 (0.475)	0.0997 (0.630)
Ln GDP PPP per capita		-0.106*** (0.0324)	-0.0270 (0.0851)	-0.136*** (0.0449)	-0.0171 (0.120)		0.0889** (0.0390)	-0.0890 (0.101)	0.0899** (0.0400)	-0.102 (0.115)
Tournament * Ln GDP PPP per capita		0.102** (0.0469)	0.0903* (0.0506)	0.128** (0.0644)	0.113 (0.0721)		-0.0594 (0.0567)	-0.0275 (0.0602)	-0.0596 (0.0580)	-0.0273 (0.0651)
Dark Illustration			0.0917 (0.0665)		0.120 (0.0942)			0.00895 (0.0791)		0.0110 (0.0846)
Demographic Controls	N	N	Y		Y	N	N	Y	N	Y
Observations	180	180	180	180	180	180	180	180	180	180
R-squared	0.021	0.049	0.395			0.010	0.034	0.130		

Notes: Standard errors in parentheses. The dependent variables are the utilitarian choice to sacrifice one individual to save five others and donation in a charitable decision. The independent variables of interest are the treatments, a dummy indicator for whether the subject had individual-based or tournament-based compensation that depends on the accuracy of data transcription, and the interaction between this treatment and log GDP per capita. Other control variables include the treatments, a dummy indicator whether the trolley scenario had light or dark-skinned individuals being sacrificed for the footbridge as opposed to bystander scenario of the trolley problem and whether the trolley scenario had light or dark-skinned individuals being sacrificed. Income data from World Economic Outlook Database (IMF 2009). Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

For Online Publication

## A Web Appendix:

**A.1 Literature** Going back to Smith, Mill, and Montesquieu, a line of scholars theorized that market forces increase morality. “Wherever there is commerce, manners are gentle” (Montesquieu 1749), “Commerce operates to cordialize mankind” (Paine 1792), and “The economical advantages of commerce are surpassed in importance by those of its effects, which are intellectual and moral” (Mill 1848). Smith and Hume, too, wrote of virtues being enhanced by commerce (Rosenberg 1964). An equally distinguished line of economics thinkers, however, theorized the opposite. “Capitalism creates a critical frame of mind, which destroys moral authority” (Schumpeter 1942); markets make fewer demands on people’s elevated motivations (Hayek 1948); “the competitive instinct has a profoundly degrading effect on individual judgment and conduct” (Veblen 1899); “Capitalist society undermines its own moral foundations through alienation and exploitation in the capitalist production process” (Marx 1867); money has alienating properties though competition also fosters empathy not among the competitors but between competitors and third parties (Simmel (1955) as cited by Hirschman (1982)). Classical political economists focused on the ways that certain exchanges can influence the kind of people we become. Markets change individuals’ economic mentalities to behave more as neoclassical economic theory would predict, which—according to some—perpetuated the myth that humanity’s innate propensity is to barter and trade rather than reciprocate and redistribute (Polanyi 1944). Notably, the intellectual history of the *doux commerce* thesis seems to stop around 1850, the starting point of a centuries-long trend in which scholars perceived markets to decrease morality—a point that will be relevant to the experimental findings and the theory.

Smith also suggested that if our preferences are endogenous to markets, then it is circular to appeal to a market’s ability to satisfy those preferences as its central justification. Market outcomes cannot be ranked unambiguously by preference rankings if the preference rankings themselves depend on markets.<sup>19</sup> If market experiences impact utilitarian preferences, then some philosophers argue it would be circular to use those

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<sup>19</sup>A labor market would fail, even if it were efficient and even if it were voluntary, if it placed workers in relations of servile dependence or deskilled them to function as mere tools.

Smith saw the market place as a political and cultural as well as an economic institution, where differing interests wielded power and where some types of exchanges shaped the participants. If markets in such domains are political and cultural institutions, then market failure takes on a different meaning than is supplied by the Pareto criterion. If labor markets undermine collective decision-making skills on which a democratic society depends, then we might judge such markets a failure even if they are efficient. Human development is relevant to its assessment.

Marx, like Smith, saw labor as shaping human preferences and capabilities. Many workers are treated as “appendages to machines.” Normative condemnation of capitalism focuses on its degradation of human beings to animals and things. A worker’s preferences and capabilities are shaped by the organization of work. Marx thus makes a causal claim: workers’ preferences change because of the structure of the labor market, shaped by the increasing division of labor which itself is fueled by the quest for efficiency. These preferences and capabilities are relevant to our assessment of markets here.

utilitarian preferences to evaluate markets (Satz et al. 2010).<sup>20</sup>

Economists and non-economists hotly contest the proper scope of markets—economists have tended to focus on the boundary between markets and government (Hart et al. 1997), whereas non-economists have tended to focus on the boundary between markets and what should not be on the market, i.e., market inalienability, for example, in the areas of surrogacy, organ transplants, and worker’s compensation for pain and suffering (Posner 1999; Friedman 2010). While economists primarily focus on efficiency, philosophers worry about how markets leave their mark on social norms (Sandel 2010). An oft-stated concern is whether people become corrupted or degraded when they are commodified (Radin 1987)<sup>21</sup> and whether market competition makes people immoral (Shleifer 2004). Roth (2007) delineates certain market transactions as repugnant and Mankiw and Weinzierl (2010) suggest that standard normative economic theory may need to be broadened to address why some normative arrangements (e.g., taxing height, which they model as being economically optimal) are perceived as repugnant.

Even when something is already on the market, a debate persists regarding how much market competition to introduce. The U.S. Supreme Court has stated that “[t]he heart of our national economic policy long has been faith in the value of competition” (*Standard Oil v. FTC*, 340 U.S. 231, 248 (1951)). This debate plays out in the proper degree of pay-for-performance incentives for teachers and doctors (Lemieux et al. 2009) and in characterizations of the modern economy as a winner-take-all society (Frank and Cook 2010).

**A.2 Evidence** In general, measuring how market experiences affect moral values is difficult. Inferring causality from correlation is difficult since the causality can go in both directions. Many ethnographic and historical studies recount the impact of modern economic institutions on traditional or indigenous cultures, and changes in economic organization may foster dramatic changes in value orientations (Bowles 1998). Economic studies experimentally investigating the effects of markets on moral behavior are often conducted in laboratory settings. Some studies in this literature found that markets erode moral behavior. Falk and

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<sup>20</sup>Labor markets were perceived to be special. Classical political economists offered distinct theories for labor and consumer goods markets. “The difference of natural talents in different men is, in reality, much less than we are aware of; and the very genius which appears to distinguish men of different professions, when grown to maturity, is not upon many occasions so much the cause, as the effect of the division of labor.” (Smith 1776, pp. 28-29). Smith suggests that what distinguishes labor from other markets is that some system for controlling work must be devised, but the system of control itself will have important effects on the laborer, his productivity, his capacities, and his relationship to the employer.

<sup>21</sup>Regarding labor markets, Smith (1776) suggests that what a person can do and be, what he wants and what he can hope for, are influenced by the structure and character of the market. More specifically, Smith’s assessment of labor markets suggests that markets would fail if they eroded workers’ sense of justice and public spirit (Smith 1761, pp. 189-190; Satz et al. 2010): “The employment of the great body of the people comes to be confined to a few operations ... and generally becomes as stupid and ignorant as it is possible for a human creature to become... [He is incapable] of forming any just judgment concerning many even of the ordinary duties of private life. Of the great and extensive interests of his country, he is altogether incapable of judging.” (Smith 1776, pp. 781–782)

Szech (2013) examined the effects of a double auction market where subjects bargain over killing a mouse. Smith (1962) and Roth et al. (1991) report that experimental markets converge towards equilibrium, in which considerations of fairness are minimized. Plott (1983) found that product purchases create negative externalities that affect other participants. Hoffman et al. (1994) and Ross and Ward (1995) found that framing a non-market interaction with market terminology reduced the importance of moral considerations. Wout et al. (2006) found that priming people to think of money led to more individualistic and less pro-social behavior. Bartling et al. (2015) examined a product market setting and found that subjects in market contexts exhibit less social concerns. Several other studies suggest that price crowds out moral behavior (Bowles 2008; Bowles and Hwang 2008; Frey and Jegen 2001; Houser et al. 2008). Meanwhile other studies found that markets elevate moral behavior. Henrich et al. (2010) found that exposure to market interaction facilitates the adoption of pro-social norms like fairness and cooperation. Fehr et al. (1993) and Fehr and Falk (1999) report settings where contractual incompleteness makes trust and trustworthiness necessary for efficient exchange. And Francois et al. (2009) found that market competition builds trust (an attribute typically interpreted by economists to be pro-social and moral). Whether market experiences affect moral behavior in a labor market setting is a different question.

Recent research uses natural experiments to study the causal effect of individual experience on ideology. Fisman et al. (2009) found that market-oriented ideology of an instructor affects students' behavior in economic games to be less pro-social. Di Tella et al. (2007) found that allocation of property rights makes beliefs more favoring of free markets. Cantoni et al. (2014) found that textbook reform affected attitudes toward free markets. Other studies report that individuals make different moral decisions in regards to in-group and out-group members (Tajfel et al. 1971; Hoffman 2001; Chen and Li 2009) and that market interactions affect the treatment of out-group members (Kennedy and Stephan 1977; Bowles 1998; Echebarria-Echabe and Fernandez Guede 2003).

The importance of fairness norms in markets is highlighted by Kahneman et al. (1986) and supported by physiological studies. Sanfey et al. (2003) found that unfair offers elicited activity in brain areas related to emotion and cognition. Wout et al. (2006) found that skin conductance activity was higher for unfair offers, whereby the pattern was only observed for offers proposed by humans but not for offers generated by computers. Manipulation of the affective (emotional) state, and in particular, oxytocin, of an individual alters moral judgment (Wheatley and Haidt 2005; Schall et al. 2008; Valdesolo and DeSteno 2006; Churchland 2011). The affective state may be manipulated through the market experience, in and of itself, in which the stimulus increases temporarily the accessibility of knowledge units in the memory of an individual, which makes it more likely that these knowledge units are used in the reception, interpretation and judgment for subsequent external information. Such a channel is called priming (Bargh and Chartrand 2000; Storms 1958;

Higgins and Chaires 1980), which has been employed by Benjamin et al. (2010) in behavioral economic studies.

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There is also a large literature on the role of emotions in decision-making (Loewenstein and Lerner 2003). Many experiments document how the part of the brain responsible for processing emotions is active when individuals are faced with moral dilemmas, and it is believed that emotions play an integral role in deontological decision-making (Cushman et al. 2010). Deontological judgments may be related to emotions because the moral calculus involves the weighing of contexts. When the part of the brain responsible for processing emotions is unavailable, individuals are more likely to make utilitarian decisions (Koenigs et al. 2007).

**A.3 Trolley Problem** Measuring moral values is challenging. This study measures three forms of moral values: utilitarian versus deontological values, other-regarding preferences, and charitable donations. Since other-regarding preferences and charitable donations are more standard in the economic literature, we give the following brief overview to utilitarian and deontological values. Utilitarian and deontological commitments broadly represent consequentialist and Kantian traditions, which offer competing normative theories for law and public policy to judge the morality of actions. In the utilitarian worldview, policymakers calculate the good and the bad consequences of choices; in the deontological worldview, policymakers apply principles of moral duty. Measuring utilitarian and deontological values in practice is challenging, but the moral trolley problem (Foot 1967) is commonly used to measure utilitarian and deontological commitments (more than 200,000 individuals have taken the moral trolley problem, see, e.g. Mikhail 2007; Miller 2008). The universal response to the moral trolley problem suggests the lack of incentives do not render random noisy responses.<sup>22</sup> Notably, exposure to moral philosophy also does not predict decision-making in the moral trolley problem (Hauser et al. 2007). Untutored adults and even young children are capable of drawing intelligent distinctions between superficially similar moral trolley scenarios (see, e.g., Alter et al. 2007; Cushman et al. 2006; Haidt 2001; Robinson et al. 2007; Solum 2006; Miller 2008; Young and Saxe 2008). The moral trolley problem can be compared to the Implicit Association Test, a non-incentivized measurement of unconscious

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<sup>22</sup>In contrast, social preferences measured by many experimental games vary by gender and across country (Croson and Gneezy 2009; Herrmann et al. 2008).

stereotypes that is increasingly used by economists to measure attitudes (Beaman et al. 2009; Lowes et al. 2015).

The bystander scenario is logically equivalent to the footbridge scenario, but does not require consideration of an emotion-evoking personal violation to reach a utilitarian outcome (Greene et al. 2001). The thought of harming someone in a “personal” way, as in the footbridge dilemma, is said to trigger a negative emotional response that effectively says, “That’s wrong, don’t do it!” This emotional alarm bell overrides any consequentialist inclination to approve the five-for-one tradeoff and has been proposed as an explanation for why activating emotional processing can alter moral judgment (Greene et al. 2004; Greene et al. 2008). Under the hypothesis that negative emotions in a market-oriented setting affect value choices, we should only expect a behavioral response in the footbridge scenario. Roughly put, negative emotions, like repugnance, cause deontological responses to moral judgments (Wheatley and Haidt 2005; Schall et al. 2008), while positive emotions generate utilitarian responses (Valdesolo and DeSteno 2006).<sup>23</sup> Market competition may be perceived to be unfair early in the course of market development, thereby triggering negative emotions and deontological commitments, thus causing individuals to become more moral (duty-oriented). The argument builds on the observation that early societies have less competition (Leibbrandt et al. 2013) and, in non-capitalist cultural mentalities, a “fair” price is more important to a community than a “free” market price (Scott 1977). As markets develop, competition becomes perceived as fair, triggering positive emotions and utilitarian commitments. This is consistent with the changing views on the fairness of meritocracy (Zingales 2014); for example, in dictator games, Berkeley students reward hard work while Kenyans did not (Jakiela 2015). Related studies argue that market-oriented policies (and growth) are endogenous to attitudes and beliefs about market-orientation (Buera et al. 2011), while finding that globalization and market integration are associated with moral behavior (Henrich et al. 2001). The globalization comparison may be apt in another way as the subjects did not know who they were competing with in the labor market intermediary and the labor market intermediary itself has contributed to a globalized labor market. This aspect of the research setting differs from other experiments on employment structure (Bandiera et al. 2005; Bandiera et al. 2007; Bandiera et al. 2009; Bloom et al. 2013).

**A.4 Manipulation Check** This section checks whether the dark-skinned illustration primes out-group considerations for Whites (or whether light-skinned illustration primes out-group considerations for

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<sup>23</sup>The original experiments involve various manipulations like having subjects answer the moral trolley problem with a smelly trash can in the room or after watching a fun video clip. For example, Schall et al. (2008) expose participants to a bad smell or a disgusting room and Valdesolo and DeSteno (2006) induce positive affect by showing participants a 5-min comedy clip taken from Saturday Night Live. More specifically, Valdesolo and DeSteno (2006) report that positive emotions can override negative emotions caused by the footbridge prompt, leading to a higher likelihood of a utilitarian response.

non-Whites). To validate that the moral trolley illustrations do in fact prime out-group considerations, we estimate:

$$(6) \quad \text{Donate}_i = \beta_0 + \beta_1 \text{White}_i + \beta_2 \text{DarkIllustration}_i + \beta_3 \text{White}_i \times \text{DarkIllustration}_i + \beta_4 X_i + \varepsilon_i$$

where the coefficient of interest is  $\beta_3$ , which captures, in a differences-in-differences framework, whether Whites are less likely to donate when presented with a dark illustration of the moral trolley problem (as compared to non-Whites and as compared to being presented with the light illustration). Whites do not generally donate disproportionately more or less than non-Whites (Column 1 of Table A.1) and the dark-skinned illustration does not generally affect donations to the Red Cross or Red Crescent (Column 2). However, as Table A.1 Columns 3–5 indicate, the difference between the donation rates when individuals are presented the dark-skinned illustration and the light-skinned illustration increases when the individuals are White as opposed to non-White. Whites are roughly 29% less likely to donate than non-Whites when presented a dark-skinned illustration of the moral trolley problem than when presented a light-skinned illustration, and this difference is statistically significant at the 5% or 10% level. Figure A.8 graphically displays the differences-in-differences analyses of the effect of out-group priming on charitable donations. White workers are 29% less likely than non-White workers to donate to charity when presented a dark-skinned illustration of a moral dilemma than when presented a light-skinned illustration of a moral dilemma. To unpack this statistic, 41% of White workers donate when presented a dark-skinned illustration, 55% of White workers donate when presented a light-skinned illustration, 50% of non-White workers donate when presented a dark-skinned illustration, and 34% of non-White workers donate when presented a light-skinned illustration.

This finding is consistent with studies finding that campaign and donation advertisements can prime racial attitudes (Hutchings and Valentino 2004). Randomly varying the race of victims in an audiovisual presentation of Hurricane Katrina victims increased donations by respondents of the same race as the victims (Fong and Luttmer 2009).

**A.5 The Effect of Tournaments on Productivity** Tournament-based compensation increases productivity overall. Tournaments reduced the log error rate (more precisely, this is the log of 1 plus the error rate, to ensure that those with 0 error rates do not drop from the sample) significantly and this effect is robust to controls (Appendix Table A.2 Columns 1 and 2) and statistically significant at the 1% level. We present estimates of the specification:

$$(7) \quad \text{LogError}_i = \beta_0 + \beta_1 \text{Tournament}_i + \beta_2 X_i + \varepsilon_i$$

Log errors are calculated from post-treatment data entry, i.e., the last three paragraphs. We restrict the sample to non-attriters. The effect is still robust when controlling for log error rates from the first three paragraphs, i.e., the pre-treatment data entry (Column 3), which, unsurprisingly, strongly predicts log error rates post-treatment. In addition, as falsification check, treatment should not affect data entry before subjects learn their payment scheme, and, in fact, a formal estimation confirms that treatment does not affect pre-treatment error rates (Column 4). The impact of tournament-based compensation on productivity is sizable. The average log post-treatment error rate is 2.8 for non-attriters, so the coefficient of 0.37 in Column 3 suggests that non-tournament conditions increase log error rates by 13%. Gneezy et al. (2003) also found that tournament-based compensation increases productivity, especially among males, which we find in our study as well.

**A.6 Limitations** The individuals participating in the study are already embedded in the market. Individuals who move from not being embedded to being embedded may behave differently from those in a marginal intervention that shifts the degree or type of market embeddedness.

Second, the tournament treatment condition may be conflated with confounders that limit the ability to generalize from this study. For example, workers may have misinterpreted the tournament treatment condition to include a possibility of promotion, contract renewal, or wage increase. However, consumers have been shown to interpret silence in contracts in accordance with the legal meaning of silence (Listokin 2010). Workers might also simply have been alerted to the existence of other workers and the need to be accurate inside the tournament. However, the existence of other workers and the need to be accurate are a standard part of this labor market intermediary experience. With the ever-present threat of an employer rejecting the employee's work, the tournament condition is less likely to contribute to this awareness in a significant way.

Third, differences between the two payment schemes could lead to differences in effort exerted. If the tournament condition induced more effort from subjects, effort could impose an additional cognitive load, and cognitive load has been found to interfere with utilitarian moral judgment (Greene et al. 2008). Cognitive load induced in tournaments, however, is not consistent with the result that non-tournament workers donated more on average and the fact that cognitive load has not been found to affect donations. If anything, cognitive load may slightly increase donations (Dickert et al. 2011; Hauge et al. 2015; Cornelissen et al. 2007), but Kessler and Meier (2014) found that some cognitive load effects on donations are not robust.

Fourth, the global labor supply in our study is an unusual artifact that allows cross-country comparisons not easily possible in more typical field experiments. A global labor supply in an anonymous setting also raises the question of who workers think their competitors are and whether their responses would be different if they knew the identities of their competitors. If tournaments are perceived as unfair offers (Camerer 2003; Sanfey et al. 2003; Krajbich et al. 2009; Roth and Murnighan 1982), this perception would predict increased

deontological commitments, since negative emotions can cause deontological responses to moral judgments. Workers from poorer countries who fear they are competing against workers from wealthy countries could view these tournaments as unfair. Presenting data entry of Tagalog transcriptions, to which a country's income is unlikely to lend comparative advantage, mitigates this concern, and global labor markets is one dimension of increased labor market competition.

Fifth, it is possible that workers become aware of an ongoing study, if their suspicions are aroused by the moral trolley problem. However, this suspicion does not cause individuals to attrite at a high rate after being asked this moral dilemma. Moreover, experimenter demand effects are still minimized since subjects are not aware of the other treatment conditions and therefore would have difficulty to intuit what is their experimental treatment. Even if subjects exposed to individual-based compensation and then tournament think they should be responding in a more deontological fashion, this response should be observed in both the footbridge and bystander scenario. Finally, in the control experiment that recruits subjects in the same manner with data entry work, the shift from data entry to the moral trolley problem results in responses to the footbridge and bystander scenarios that corresponds to the average response in the population in the main results.

Sixth, the lock-in task minimizes attrition. But workers may respond merely to a change in contract conditions midway through the experiment rather than to a change from individual-based compensation to tournaments. It is difficult to argue that the entire effect of tournaments on deontological choices is due to change in contract conditions since the "change in contract conditions" effect is not found for the bystander scenario of the trolley problem (Figure 3). Moreover, if workers are offended by the change in contract conditions as they are when they face a wage cut (Chen and Horton 2014), they can quit at any time, yet attrition after treatment is revealed to be on the order of 10% and similar across treatment interactions. There is the possibility that the workers who attrite in each treatment interaction are different. This is only a concern for the first treatment stratification—tournament or individual-based compensation—since everyone who saw the moral trolley problem in whichever manifestation completed the task. A less conservative bound would assume that the workers who drop out respond to treatment at the same rate as the workers do in the other treatment, but a more stringent bound would assume that the 10% of workers who drop out after the lock-in task would have responded to treatment in exactly the opposite way. In the worst case scenario, all tournament workers who attrited after the lock-in task would have made a utilitarian decision and all non-tournament workers who attrited after the lock-in task would have made the deontological decision. Then, for example, the estimates of the effect of tournament-based compensation on deontological commitments in Table 2 are a little smaller: 0.23, 0.26, and 0.30 respectively for the coefficient on the interaction between tournament-based compensation and the footbridge scenario, at 10%, 5%, and 10% statistical significance

respectively.<sup>24</sup> The estimates of the effect of tournament-based compensation on deontological commitments towards out-groups in Table 3 are also a little smaller: 0.36, 0.47, and 0.59 respectively for the differences-in-differences-in-differences estimate, at 16%, 10%, and 10% statistical significance respectively.<sup>25</sup> For the estimates of the effect of tournament-based compensation on charitable donations in Table 5, it is reasonable to think that the attriters would not have been tournament winners, and if the donation of attriters is assigned the donation rate of tournament losers, the estimate in Column 1 is 0.16 and statistically significant at the 10% level.

Seventh, income and substitution effects may play a role if the expected value of the task to the worker changes depending on whether the worker believes that each of the two other workers have an equal chance of being most accurate. Relatedly, tournament-based compensation may involve greater risk. Yet, a separate survey showed that 74% of tournament workers believed they would win the tournament and this belief was not related to their actual performance. Still, no income, substitution, or risk effects are observed for the bystander scenario of the trolley problem.

Tenth, these measures of ethical behavior are somewhat decontextualized, like the Implicit Association Test and surveys of time preferences. Examining whether tournament-based compensation causes workers to be more or less willing to lie, cheat, or take money from other participants on Mechanical Turk can be investigated in future work.

Scholars of the *doux commerce* thesis were unclear about the particular mechanism through which a competitive market could affect morality. The main focus of this study was to investigate the potential average effect of tournaments on three forms of normative commitments. Extensions of the experimental setting can include: the use of wage pay as an alternative to individual-based compensation and tournaments; charity work as opposed to paid work; cooperation as opposed to competition; and degree of disintermediation of responsibility. Donations can be made to workers who lost the tournament rather than to third parties. All of these are fruitful avenues for exploring the effects of different dimensions of the market experience on moral judgment, conceptions of rights, and duties.

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<sup>24</sup>For the second and third estimates, if missing control variables are assumed to be the mean level of the observed values, the coefficients are 0.22 and 0.30, both still at 10% statistical significance.

<sup>25</sup>The second and third estimates are also significant at the 16 or 17% level when missing control variables are assumed to be the mean level of observed values.

## **Appendix Figure A.1: Placeholder Task at Amazon Mechanical Turk**

### **Transcribe Text**

Instructions:

- After you have read the instructions, go to this site to begin work: [Click Here](#)
- Copy text exactly as it appears in the scanned image.

Payment:

- You will receive 10 cent reward for completing the first paragraph, you can earn much more in bonus.
- There will be a total of six paragraphs. An additional 50 cents will be provided for completing the short survey at the end, which should take less than three minutes.
- When you complete the survey at the end, you will receive a completion code in order to receive payment.

You MUST keep this window open in order to enter the completion code. Bonuses will be paid after the HIT expires or after the work has been completed.

Enter completion code here:

## **Appendix Figure A.2: First Page at External Host**

### **Transcribe Text**

Instructions:

- Copy text exactly as it appears in the scanned image.

Payment:

- You will receive 10 cent reward for completing the first paragraph, you can earn much more in bonus.

- There will be a total of six paragraphs. An additional 50 cents will be provided for completing the short survey at the end, which should take less than three minutes.
- When you complete the survey at the end, you will receive a completion code in order to receive payment.

You **MUST** keep this window open in order to enter the completion code. Bonuses will be paid after the HIT expires or after the work has been completed.

Would you like to continue?

### **Appendix Figure A.3: Second Page at External Host**

Task:

You will be presented with three paragraphs. Please enter the paragraphs word-for-word in the text boxes below each paragraph, ignoring hyphenation. For example, if a word is split over two lines, ie. "bat-tery", please type "battery".

Following this task, you will be asked to do a task of similar structure, duration, and payment. You must complete both tasks to receive payment.

Payment:

You will be paid 10 cents per paragraph. A sample paragraph is shown below.

Note: Once you click "Next" you will not be able to navigate to previous pages.

**Sample Paragraph (This is just an example - real paragraphs are shown after you select "Next"):**

Paano makasarili soever tao ay maaaring pakunwari, may mga maliwanag ilang mga prinsipyo sa kanyang kalikasan, na kung saan ang interes niya sa kapalaran ng iba, at umawit ng kanilang kaligayahan na kinakailangan para sa kanya, kahit na wala siya

Nakukuha ito mula sa maliban sa kasiyahan ng makita ito. Ng mga klaseng ito ay awa o pakikiramay, ang mga damdamin na sa aming paniniwala para sa kahirapan ng iba, kapag kami ang alinman sa makita ito, o ang mga ginawa sa magbuntis ito sa isang masigla paraan.

### **Appendix Figure A.4a: Sixth Page at External Host – Piece Rate**

Task:

This task is the same as the task you have just completed.

You will be presented with three paragraphs. Please enter the paragraphs word-for-word in the text boxes below each paragraph, ignoring hyphenation. For example, if a word is split over two lines, ie. "bat-tery", please type "battery".

Payment:

You will be paid 10 cents per paragraph.

Note: Once you click "Next" you will not be able to navigate to previous pages.

### **Appendix Figure A.4b: Sixth Page at External Host – Tournament**

Task:

This task is the same as the one you have just completed, but the payment scheme is different.

You will be presented with three paragraphs. Please enter the paragraphs word-for-word in the text boxes below each paragraph, ignoring hyphenation. For example, if a word is split over two lines, ie. "bat-tery", please type "battery".

Payment:

You will be randomly matched with two other people completing the same task. Of the

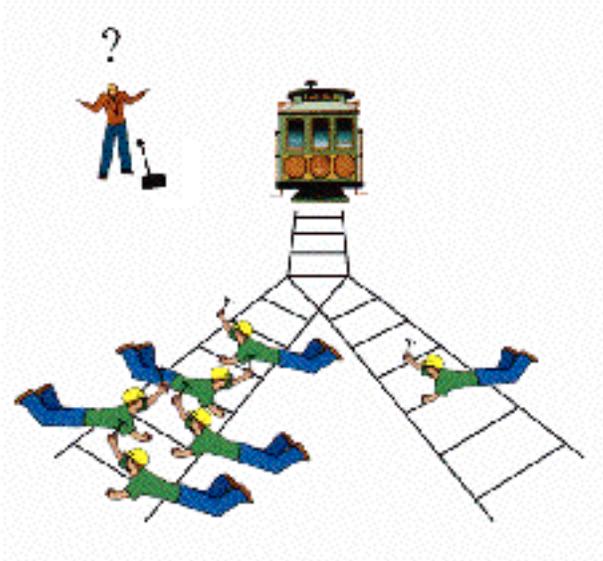
three of you, whoever submits the most accurate transcription of each paragraph will receive 30 cents, and all others will receive nothing. If there is a tie, the 30 cents will be split equally among the writers of the most accurate transcriptions.

Note: Once you click "Next" you will not be able to navigate to previous pages.

### Appendix Figure A.5: Moral Trolley Problem

Workers received one of the following illustrations and the accompanying text:

Light

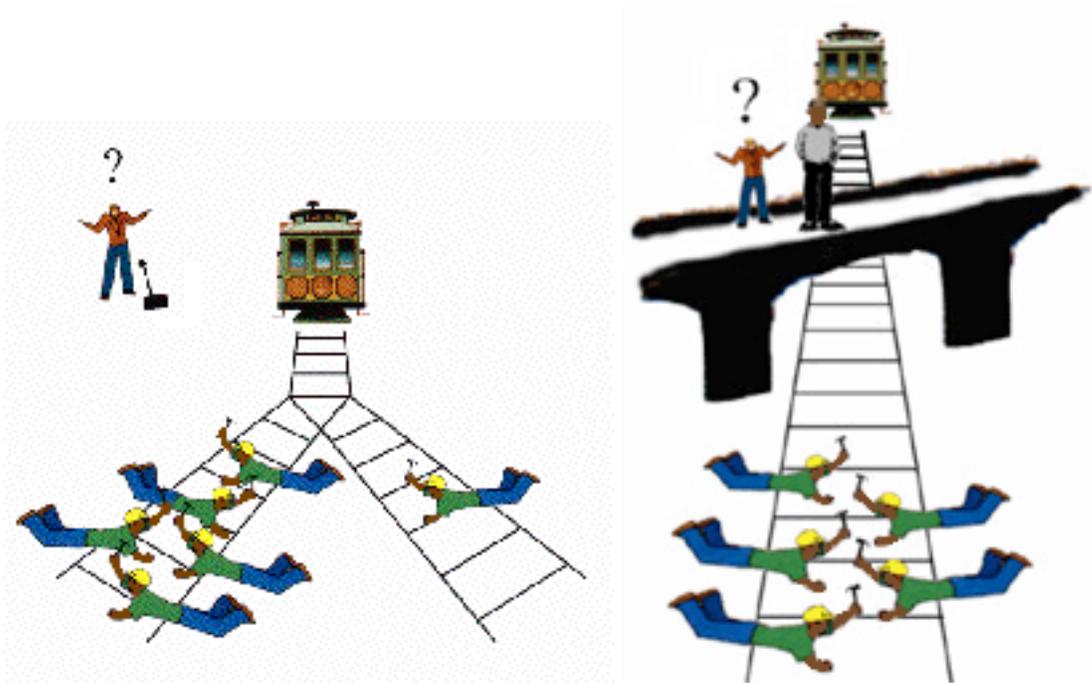


Bystander



Footbridge

Dark



Bystander

Footbridge

Bystander version:

**“A runaway trolley is hurtling down the tracks toward five people who will be killed if it proceeds on its present course. You can save these five people by diverting the trolley onto a different set of tracks, one that has only one person on it, but if you do this that person will be killed. Is it morally permissible to turn the trolley and thus prevent five deaths at the cost of one?”**

Footbridge version:

**“A runaway trolley is hurtling down the tracks toward five people who will be killed if it proceeds on its present course. You are standing next to a large man on a footbridge spanning the tracks. The only way to save the five people is to push the man off the footbridge and into the path of the trolley, but if you do that, the large man will be killed. Is it morally permissible to push the man off the bridge?”**

No, it is not morally permissible

Yes, it is morally permissible

### **Appendix Figure A.6: Charitable Donation**

**Would you be willing to donate 10 cents (\$0.10) of your earnings to one of the following charities?**

Red Cross

Red Crescent

No, I am not willing to donate

### **Appendix Figure A.7: Demographic Survey**

What is your gender?

What is your age?

What country do you live in?

What is your religion?

How often do you attend religious services? (answers may be approximate)

Never

Once a year

Once a month

Once a week

Multiple times a week

What is your ethnicity?

White

Black

Asian/Pacific Islander

Hispanic

Native American

Please click on this link to get your completion code (it will open as a new window):

Enter the code below AND on the Mechanical Turk website.

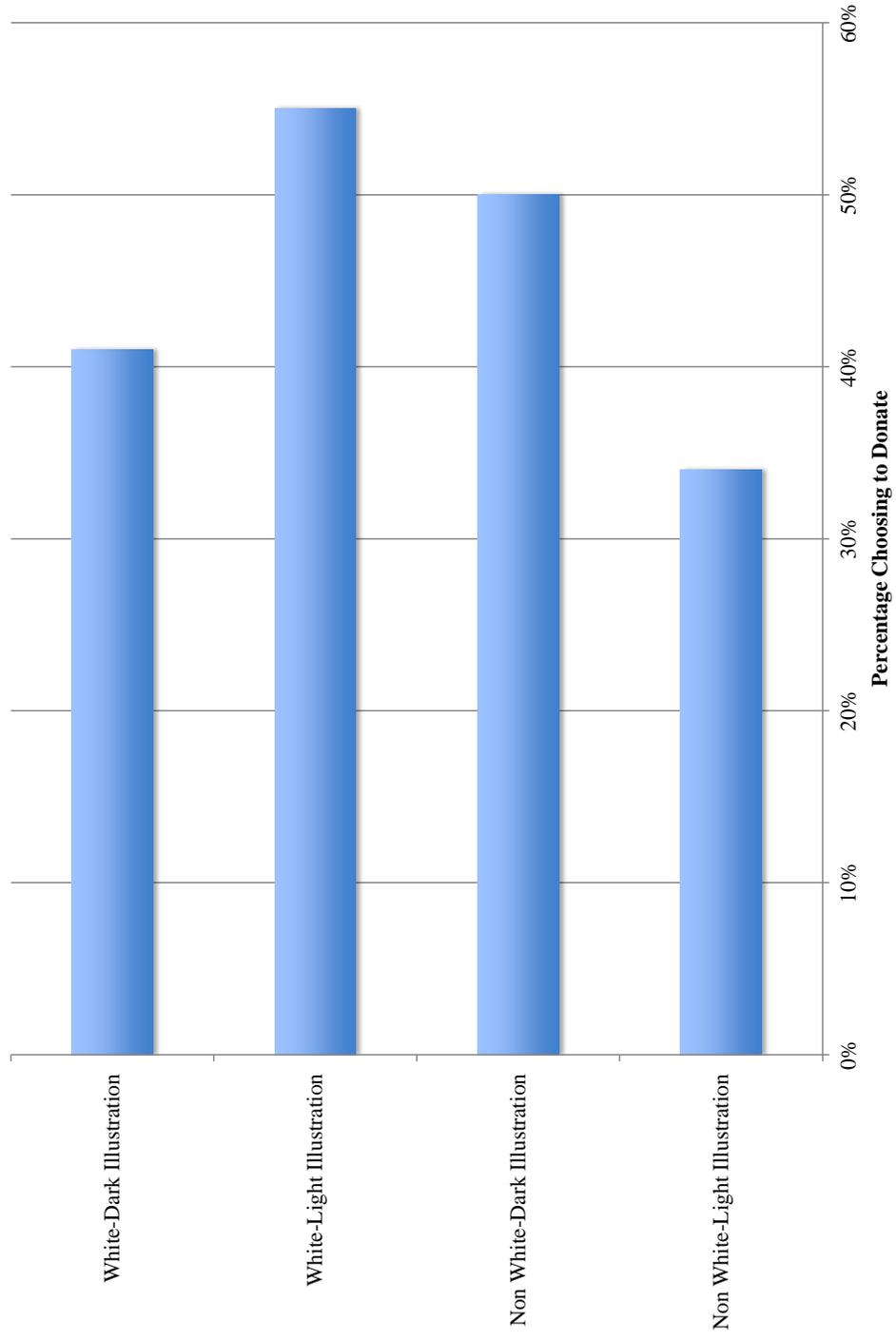
APPENDIX TABLE A.1

VALIDATION - THE EFFECT OF OUT-GROUP PRIMING ON CHARITABLE DONATIONS

	Ordinary Least Squares				Probit
	(1)	(2)	(3)	(4)	(5)
	Donate	Donate	Donate	Donate	Donate
White	0.0387 (0.0748)		0.209* (0.114)	-0.0261 (0.140)	-0.0527 (0.160)
Dark Illustration		-0.0129 (0.0753)	0.156 (0.112)	0.157 (0.111)	0.189 (0.121)
White * Dark Illustration			-0.301** (0.151)	-0.263* (0.149)	-0.285** (0.142)
Footbridge Scenario				-0.0498 (0.0749)	-0.0597 (0.0811)
Tournament				-0.139* (0.0762)	-0.161** (0.0819)
Demographic Controls	N	N	N	Y	Y
Observations	180	180	180	180	180
R-squared	0.001	0.000	0.024	0.150	

Notes: Standard errors in parentheses. Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

APPENDIX FIGURE A.8.— The Effect of out-group Priming on Charitable Donations



APPENDIX TABLE A.2  
THE EFFECT OF TOURNAMENT-BASED COMPENSATION ON PRODUCTIVITY

	(1)	(2)	(3)	(4)
		Log Error Post-Treatment		Falsification: Pre- Treatment Log Error
Tournament	0.573*** (0.176)	-0.470*** (0.179)	-0.372** (0.168)	-0.266 (0.182)
Footbridge Scenario		0.132 (0.174)	0.117 (0.162)	0.0396 (0.178)
Dark Illustration		-0.307* (0.181)	-0.279 (0.169)	-0.0772 (0.184)
Log Error Pre-Treatment			0.367*** (0.0729)	
Demographic Controls	N	Y	Y	Y
Constant	3.101*** (0.124)	-0.941 (2.133)	-1.492 (1.988)	1.503 (2.172)
Observations	174	174	174	174
R-squared	0.058	0.234	0.341	0.279

Notes: Standard errors of ordinary least squares regressions in parentheses. Sample is restricted to non-attriters. Demographic controls are dummy indicators for gender (male vs. female), race (White vs. Black vs. Hispanic vs. Other), nationality (American vs. Indian vs. Other), religion (Christian vs. Hindu vs. Muslim vs. Atheist vs. Other), age, religiosity, and log GDP per capita.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$