

# Markets and Morality: How Does Competition Affect Moral Judgment?

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## Abstract

Scholars have long debated the causal connection between markets and morality. Through a labor market intermediary, I randomly assign workers to competitive versus piece-rate conditions in order to study the impact of market interactions on three forms of normative commitments: utilitarian versus deontological values, other-regarding preferences, and charitable donations. Competition increases deontological commitments, deontological commitments towards outgroup members, and donations by productive workers, though it decreases donations by less productive workers. Consistent with the intellectual history of the *doux commerce* thesis, the effect of competition on deontological commitments may reverse with country income.

**Keywords:** Normative Commitments, Deontological Preferences, Other-Regarding Preferences, Charitable Donations, Moral Trolley Problem, Natural Field Experiment, Market Inalienability

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## **I. Introduction**

Moral commitments appear to be poorly understood. What causes moral and ethical behavior? Does the free market destroy ethical behavior (Shleifer 2004)? If so, what aspects of free markets corrode moral values? What kinds of moral commitments are affected by market experiences? These are some of the specific questions that this paper seeks to address. Social scientists and philosophers have long speculated on the connection between markets and morality (see, e.g., Smith 1998, Bowles 1998, Bisin and Verdier 2001, McCloskey 2006, Becker and Stigler 1977); answers to questions such as these may suggest appropriate policies to address the shaping of ethics in particular as they relate to financial markets.

Many economists have theorized that markets have an ameliorative effect on morality. Wherever there is commerce, manners are gentle (Montesquieu 1749); commerce operates to cordialize mankind (Paine 1792); the economical advantages of commerce are surpassed in importance by those of its effects, which are intellectual and moral (Mill 1848); virtues are enhanced by commerce (David Hume and Adam Smith as cited by Rosenberg 1964). An equally distinguished line of economic thinkers, however, theorized the opposite. Capitalism creates a critical frame of mind, and this critical frame of mind 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 1872); 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).

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. Economic organization may foster dramatic changes in value orientations (Kohn 1986), but value orientations can also foster economic change (Katz and Goldin 2002, Eriksson and Villeval 2008). People with particular pre-existing traits may also select into competitive environments, and such self-selection makes it difficult to ascertain causality when competitive conditions correlate with immoral behavior (Fletcher and Nusbaum 2008, Ford and Woodrow 1994, Detert, Trevino and Sweitzer 2008, Dubinsky and Ingram 1984).

Economists and non-economists alike hotly contest the proper scope of markets (Templeton 2008), but economists have tended to focus on the boundary between markets and government (Hart, Shleifer, and Vishny 1997) whereas non-economists have tended to focus on the boundary between what should and should not be on the market (i.e. market inalienability). This debate is alive today among legal and public policy circles in, for example, the areas of surrogacy, organ transplants, and worker's compensation for pain and suffering (see, e.g., Posner 1999, Radin 1987, Sandel 2009).<sup>2</sup> Even when something is on the market, there is a debate regarding how much market competition to introduce, e.g. pay-for-performance incentives for teachers and doctors. While economists primarily focus on efficiency, philosophers worry about how markets leave their mark on social norms (Sandel 2009). An oft-stated concern is whether people become corrupted or degraded when they are commodified and whether market competition makes people immoral (Shleifer 2004; on price and crowd-out generally, see, e.g. Houser, Xiao, McCabe, and Smith 2008, Bowles 2008, Bowles and Hwang 2008). Economists and psychologists have begun to approach the issue: documenting repugnance of certain market transactions (Roth 2007), negotiating around taboo tradeoffs (Tetlock, Kirstel, Elson, Green, and

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<sup>2</sup> Labor contracts such as the ones used in this study are no longer taboo, though, in the past, the reduction of labor to a commercial commodity to be traded on the market was considered taboo (Marx 1872).

Lerner 2010), and questioning why some normative arrangements are repugnant (Mankiw and Weinzerl 2010). However, little empirical and no experimental research has been conducted on the issue of market inalienability (Spamann 2001). Nor has the theoretical literature on the effects of markets on morality distinguished between competition and other aspects of the market experience, such as commodification.<sup>3</sup>

This paper estimates the causal impact of market interactions on three forms of normative commitments: utilitarian versus deontological values, other-regarding preferences, and charitable donations. These three dimensions are not necessarily theoretically connected but are of interest to philosophers and economists as well as scholars of discrimination. I pair the study of deontological values with that of charitable donations because the latter is more familiar to economists as an example of moral behavior and because agents experience economic costs from their decision to donate. This study is a purely positive exercise, not a normative one, as utilitarian and deontological values simply represent different moral types.

Employing the methodology of a natural field experiment, I recruit workers through a labor market intermediary to do transcriptions of historical texts. A between-subject design randomly assigns workers to different market conditions – tournament versus piece rate – in order to distinguish the self-selection into market settings from the causal effect of market experiences on moral values. The behavior of subjects in this labor market intermediary is comparable to the behavior of subjects in a laboratory (Chen, Dreber, Horton, and Rand 2009) and may be comparable to subjects in a real labor market (Horton, Rand, and Zeckhauser 2010), and so I use the language of a natural field experiment. This study can also simply be interpreted as an experiment where an innovation is the amelioration of the potential Hawthorne effects

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<sup>3</sup> Several dimensions of the modern, free market experience, such as up-or-out promotion schemes, highly incentivized bonus systems, or generally, pay-for-performance compensation (Lemieux, MacLeod, and Parent 2009) can be distinguished from the commodification dimension of the market experience.

involved when subjects are aware of an on-going experiment.

After workers finish data entry, they respond to a moral trolley test and are offered the chance to donate. The moral trolley hypothetical is a tool commonly used to measure normative commitments (Greene, Somerville, Nystrom, Darley and Cohen 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. This study uses the standard modification (bystander vs. footbridge scenario) to measure utilitarian versus deontological values and a new 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.<sup>4</sup> The footbridge scenario emphasizes the utilitarian versus deontological contrast in moral values because it emphasizes the act involved in pushing an individual to his death versus the duty not to do so (Hauser 2006).<sup>5</sup> At one extreme, the moral trolley problem reflects real-life legal cases in which people, stranded at sea, have chosen to kill and eat one person to save the others. It also reflects many policy decisions by both lawmakers and businesses.

My first set of results is as follows. After doing historical transcriptions, workers who were assigned tournament work are more deontological than workers who were assigned to piece rate work. Of the 90 workers assigned the piece rate condition, 63% made the utilitarian choice;

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<sup>4</sup> A deontological perspective takes into consideration the Kantian categorical imperative to avoid wrongdoing, even when it appears to produce good consequences.

<sup>5</sup> Though there are non-deontological interpretations of the footbridge scenario, these have been rejected by a number of moral philosophers (Thompson 1985, Gorr 1990). Nevertheless, the decision to sacrifice is less controversially connected to utilitarian decision-making.

of the 90 workers assigned the tournament condition, 49% made the utilitarian choice. The difference comes entirely in the footbridge scenario, where 47% of piece rate 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.

To investigate other-regarding preferences, in a modification of the moral trolley problem superimposed onto the bystander and footbridge scenarios, I vary the race of the individuals being sacrificed 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 on the trolley tracks and footbridge and half see an illustration with dark-skinned individuals. The moral trolley illustration with different races is used to investigate where people draw the line between in-groups and out-groups and whether competition makes them more utilitarian regarding out-group members. Laboratory experiments and theoretical studies suggest that individuals are more charitable towards in-group members (Chen and Li 2009) and that market interactions may affect the treatment of out-group members (Bowles 1998, Echebarria-Echabe and Guede 2003, Kennedy and Stephen 1977).

My second result is that workers who were assigned to tournament work are more deontological towards out-groups than workers who were assigned to piece rate work. 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 piece rate 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.

Since the moral trolley illustration is not a modification established in the literature<sup>6</sup>, I verify that the skin color of individuals being sacrificed in the moral trolley illustration does in fact prime out-group considerations by examining whether skin color affects charitable donations. Since the individuals that are objects of sacrifice appear to be in need, the illustration of these individuals primes workers to think that their donations are helping individuals of the race in the illustration, much like how campaign or charitable donation ads prime racial attitudes by tying particular narratives to the race of individuals in those narratives (Valentino, Hutchings, and White 2004, Fong and Luttmer 2009).

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.

My final set of results is as follows. Tournament winners are more likely to donate than tournament losers or piece rate workers. 51% of piece rate workers choose to donate and 41% of tournament workers choose to donate. Among the tournament workers, 54% of tournament winners donate while 32% of tournament losers donate. At first glance, the finding that tournament winners donate more than tournament losers appears inconsistent with an established literature in experimental economics that finds that individuals who feel they deserve their earnings are less generous (Hoffman, McCabe, Shachat and Smith 1994). This apparent

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<sup>6</sup> Studies have found that people become more willing to sacrifice in the moral trolley problem when non-group members such as non-human primates (Petrinovich, O'Neill, and Jorgenson 1993, Petrinovich and O'Neill 1996) are presented as the objects of sacrifice, but presenting moral trolley problems with different races is methodologically difficult in the traditional laboratory because of the experimenter demand effects associated with subjects being aware they are being studied.

contradiction may be due to subjects knowing that they have earned additional income in the experimental economics laboratory studies as opposed to workers not knowing that they have won their tournament in this study. The workers' lack of knowledge of their status may cause them not to feel that they deserve their earnings yet and, thus, make them more charitable.

However, it may still be the case that more productive workers, not tournament winners, are more charitable. When winners are computed for the piece rate condition, these 'placebo' winners are not more likely to donate, suggesting that the tournament condition may cause the winners to be more generous, consistent with the evidence that individuals in more market-oriented countries being more charitable (Alesina and Glaeser 2005).

This study is related to a number of natural experiments studying the causal effect of individual experience on ideology (Beaman, Chattopadhyay, Duflo, Pande, Topalova 2008, Di Tella, Galiani, Schargrodsky 2007, Fisman, Kariv, Markovits 2009); to non-experimental studies examining more directly the behaviors associated with ethical behavior (Titmuss 1970, Gneezy and Rustichini 2000); to laboratory experiments presenting hypothetical scenarios (Brandt and Charness 2004, Carpenter 2005, Hegarty and Sims 1978; Breer and Locke 1965). Methodology, it is related to tournament experiments (e.g. Niederle and Vesterlund 2007, Freeman and Gelber 2009), priming experiments (e.g. Benjamin, Choi, and Strickland 2009), and management experiments (e.g. Bandiera, Barankay, and Rasul 2005, 2007, and 2009 and Bloom, Eifert, Mahajan, McKenzie, and Roberts 2009). Section II presents a simple model to aid in interpreting the experiment. Section III provides the methodology. Section IV presents the results. Section V discusses limitations and alternative theories. Section VI concludes.

## **2. Theoretical Framework**



This paper uses three measures 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, I 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 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, Thomson 1985) 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). 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., 2008; Solum, 2006; Wellman and Miller, 2008; Young and Saxe, 2008). The universal patterns of response suggest that the moral trolley problem is an interpretable measure of normative commitments.<sup>7</sup>

A growing literature in moral psychology documents how the manipulation of the affective state of an individual alters moral judgment (Wheatley and Haidt 2005, Schnall, Haidt and Clore 2005, Valdesolo and DeSteno 2006). A number of 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 important role in deontological decision-making (Cushman, et. al. 2009). When the part of the brain responsible for processing emotions

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<sup>7</sup> Relatedly, the Implicit Association Test has been used by economists as an interpretable measure of stereotypes (Beaman, Chattopadhyay, Duflo, Pande, Topalova 2008).

is unavailable, individuals are more likely to make utilitarian decisions (Koenigs, Young, Adolphs, Tranel, Cushman, Hauser, and Damasio 2007). Deontological judgments may be related to emotions because the moral calculus involves the weighing of contexts. Moral trolley judgments respond to framing effects (see, e.g. Doris, 2002; Kahneman and Tversky, 1984; Kelman et al., 1996; Schnall et al., 2008; Sunstein, 2005; Unger, 1996; Valdesolo and DeSteno, 2006; Wheatley and Haidt, 2005). Specifically, the thought of harming someone in a “personal” way, as in the footbridge dilemma, triggers a negative emotional responses that effectively says, “That’s wrong, don’t do it!”. This emotional alarm bell overrides any consequentialist inclination to approve of the five-for-one tradeoff and has been proposed as an explanation for why activating emotional processing can alter moral judgment (Greene et al., 2001, 2004, 2007).

Some *doux commerce* scholars believe that competition activates the emotions (Hirschman 1982). If competition has any psychological affect, its role can be captured in a framework similar to that of Akerlof and Kranton (2000) and Benjamin, Choi, and Strickland (2009). This framework helps interpret the effect of psychological manipulation on economic behavior. In their model, priming reveals the marginal effect of increasing the strength of affiliation with a particular category. The ethical behavior of individuals in the competitive category may differ from the behavior of those in the piece-rate category. Consider an action choice  $x$ , such as the decision to donate or be deontological. A worker belongs to a category  $C$ , competitive or piece-rate, with strength  $s$ . Let  $x_0$  denote the worker’s preferred action in the absence of treatment, and let  $x_C$  denote the action for members of category  $C$ . The individual chooses  $x$  to maximize  $U = -(1-w(s))(x - x_0)^2 - w(s)(x - x_C)^2$ , where  $0 \leq w(s) \leq 1$  is the weight placed on category  $C$  in the worker’s decision. Assume that  $w(0) = 0$  and  $w' > 0$ . Assume that  $s$  has a steady-state value  $s$  but can be temporarily perturbed away from  $s$  by treatment  $\varepsilon > 0$ . The

first-order condition gives  $x^*(s) = (1-w(s))x_0 + w(s)x_C$ , a weighted average of the action without treatment and the market norm. This implies that priming (a brief exposure to a competitive treatment or piece-rate treatment) causes  $x^*$  to move closer to  $x_C$ .

The difference in the behavior of individuals who experience the competitive treatment versus the behavior of individuals who experience the piece-rate treatment captures the difference between the respective  $x_C$  of each category. In other words, the between-subject design captures the difference between the marginal effect of increasing competition, as a social category, on normative commitments and the marginal effect of increasing piece-rate, as a social category, on normative commitments. Therefore, whenever a result in the tables that follow suggest that competition increased a particular behavior, it is more precisely interpreted as the difference of these two marginal effects. When interpreting the effect of market experience on out-group preferences, the racial prime from the illustration of the moral trolley scenario is superimposed onto the market experience prime and the model should be interpreted with two-dimensions of categories, competition or piece-rate and in-group or out-group.

### **III. Methodology**

This study recruits workers through a labor market intermediary (LMI), namely Amazon Mechanical Turk. Two key characteristics allow implementing the experimental design. Tasks are often done multiple times by different workers for quality-control purposes. Amazon Mechanical Turk 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 (for a

methodologically related study, see Chen and Horton 2009). Hundreds of thousands of jobs are posted each day (<https://www.mturk.com/mturk/welcome>). The behavior of subjects in this labor market intermediary is comparable to the behavior of subjects in a laboratory (Chen, Dreber, Horton, and Rand 2009) and may be comparable to subjects in a real labor market (Horton, Rand, and Zeckhauser 2010). As noted below, subjects respond to the moral trolley problem at a similar rate as does the rest of the population.

Bonuses are useful for creating arbitrarily complex contracts. The LMI is also designed to recruit a large number of workers in a short amount of time. Through an interface provided by the LMI, registered users perform tasks posted by buyers for money. The tasks are generally simple for humans to do yet difficult for computers. Common tasks include captioning photographs, extracting data from scanned documents, and transcribing audio clips. A buyer<sup>8</sup> controls the features and contract terms of the tasks, such as the design, piece rate, bonus, time allowed per task, the maximum duration of each task, and the number of times the buyer wants a task completed. Workers, who are identified to buyers only by a unique string of letters and numbers, can inspect tasks and the offered terms before deciding whether to complete them. Buyers can require workers to have certain qualifications, but the default is that workers can accept a task immediately and begin work. Once workers submit their work, buyers can approve or reject their submission. If the buyer approves, the LMI pays the worker with buyer-provided escrow funds; if the buyer rejects, the worker is paid nothing.

The LMI also allows a researcher to implement randomization although randomization is not inherent to the LMI. Although most buyers post tasks directly on the LMI website, they are also able to host tasks on an external site. I use this external hosting method; I post a single placeholder task (Figure 1) containing a description of the work at the LMI and a link for

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<sup>8</sup> A typical buyer is a firm who prefers to outsource this kind of work.

workers to follow if they want to participate. The subjects are then randomized, via stratification in the order in which they arrived at the job, to one of several treatment conditions (to be explained below but the reader can jump to Figure 8 as guide). Treatment is not revealed at this early state. All workers see identical instructions (Figures 2 and 3).

The LMI can be used to implement anything from a natural field experiment to a laboratory experiment (Harrison and List 2004). Workers come to the marketplace naturally and are unaware they are in an experiment, and this lack of awareness alleviates the Hawthorne effects, demand or experimenter effects associated with knowing that one is participating in an experiment (Orne 1962, Rosenthal 1966). I ask workers to transcribe paragraphs from a Tagalog translation of Adam Smith's *The Wealth of Nations*. An example is shown in Figure 3. 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 do the task.<sup>9</sup> 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.

Because subjects are unaware of an on-going experiment, differential attrition may arise at the time treatment is revealed (Reips 2001) and lead to bias in the estimation of treatment effects (DiNardo, McCrary, and Sanbonmatsu 2006). If attrition is high and varies across treatment groups, one must bound the estimate of the treatment effect to account for the possibility that the workers who attrite in each treatment group are different. I calculate bounds

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<sup>9</sup> Time and money are the most cited reasons for participation in Mechanical Turk (<http://behind-the-enemy-lines.blogspot.com/2008/03/mechanical-turk-demographics.html>). Some workers do it out of need. A disabled former United States Army linguist became a Turk Worker for various reasons and in nine months he made four thousand dollars (New York Times, March 25, 2007). Some drop out of college to pursue a full time career with these disaggregated labor markets (Web Worker Daily, October 16, 2008, Interview with oDesk CEO). For more information about the motivation and demographics of Mechanical Turk workers, see, e.g. Paolacci, G., Chandlery, J., and Ipeirotis, P. (2010).

in Section V but also employ a different strategy, which is to minimize attrition through a commitment mechanism. In all treatment conditions, workers face an identical “lock-in” task (Figure 3) in order to minimize differential attrition before the treatment is revealed (Figures 4A and 4B).

To investigate the effects of market experience on utilitarian versus deontological values, other-regarding preferences, and charitable donations: I employ a 2x2x2 experimental design (Figure 8). The 2x2x2 experimental design preserves power with roughly 90 workers per stratification so the treatments can be interacted with each other. The lock-in task also preserves power and is implemented by using an ambiguously worded contract as placeholder task at the LMI (Figures 1 and 2). It only 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.<sup>10</sup> Halfway through their task, i.e. after a lock-in task of 3 paragraphs at 10 cents per paragraph (Figure 3), I reveal treatment. This lock-in successfully reduces attrition.<sup>11</sup> 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 they are in the tournament or piece-rate treatment. *Pre-Trolley* attrition is attrition that occurs *after* workers see whether they are in the tournament or piece-rate treatment but *before* answering the trolley problem. Had workers not been committed through a lock-in, attrition would have been one-third (180 out of 274) instead of one-tenth (180

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<sup>10</sup> These payment levels are quite typical for this LMI. In fact, one worker emailed saying that 10 cents was too high and that the typical payment for this sort of data entry was 3 cents per paragraph.

<sup>11</sup> Attrition is defined as having over 500 errors out of a maximum of 507 characters for any paragraph.

out of 201). While the lock-in task may have independent effects, the lock-in task is identical across treatment groups and, in a separate study, does not have independent effects on the outcome (Chen and Horton 2009).

My 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 (Figure 4A) or are placed in a tournament condition (Figure 4B). 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 that paragraph and the rest receive nothing. Thus the expected value of the task to the worker stays the same<sup>12</sup> but the competitiveness factor is raised. The tournament scheme follows Gneezy, Niederle and Rustichini (2001) and Niederle and Vesterlund (2007). 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, they are asked the moral trolley problem. While it may seem a typical interaction does not involve answering questions about moral philosophy, an Internet search for moral philosophy and Mechanical Turk shows that these questions are becoming increasingly common and are less likely to arouse the suspicions of subjects. Even if subjects are responding in a way that corresponds to their awareness of being in a study, there are less a priori reasons for why subject awareness should affect footbridge responses but not bystander responses under a pure experimenter demand effects hypothesis, while there are strong

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<sup>12</sup> The expected value of the task to the employer could increase with the tournament scheme if the tournament scheme leads to a reduction in error rates.

a priori reasons for why subjects with different deontological commitments would differ in their footbridge response and not the bystander response in the scenarios that follow.

In my second stratification, I ask either the Bystander version or the Footbridge version of the moral trolley problem (Figure 5). The bystander scenario is (no emphasis is used in the study):

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?

The footbridge scenario of the moral trolley problem is:

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?

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 my study respond to the moral trolley problem in roughly the same way people do in other studies. The basic pattern that the Footbridge scenario increases deontological commitments is found in my 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%). More than 200,000 individuals have taken the moral trolley problem (Miller 2008) and in other studies, 80% is also the percentage of subjects who make the utilitarian choice in the Bystander scenario and 30% is the percentage of subjects who make the utilitarian choice in the Footbridge scenario (Copp 2010, Appiah 2008, Prinz



2007, Greene, Lindsell, Clarke, Nystrom, and Cohen 2010). Moreover, consistent with research on the universal moral grammar (Mikhail 2007), demographic characteristics do not generally predict decisions in the moral trolley problem.

My third stratification modifies the picture that accompanies the moral trolley problem. All the persons being sacrificed are colored to appear light-skinned or dark-skinned (see Figure 5 for the full set of illustrations that accompany the moral trolley problem). I 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, I ask workers whether they are willing to donate ten cents of their earnings to the Red Cross or the Red Crescent (Figure 6). I then ask for demographic characteristics (Figure 7), including gender, age, country (the categories in the subsequent regressions are the US 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>13</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, or Asian/Pacific Islander<sup>14</sup>, and Native American<sup>15</sup>).<sup>16</sup> Demographic characteristics are balanced across treatment groups, consistent with the randomization of workers across treatment. Table 1 displays summary statistics by treatment interaction. Males comprised 41% of the sample. 46% and 36% are from the US 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

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<sup>13</sup> These include Jewish, Buddhist, Sikh, Agnostic, Transcendentalism, and prefer not to answer.

<sup>14</sup> The omitted race category is Asian in the analyses that include White, Black, and Hispanic.

<sup>15</sup> There are no Native Americans in the study.

<sup>16</sup> Requesting workers to enter demographic information is quite common in this LMI since this allows firms to design computer algorithms taking into account demographic information to optimize in quality control.

once a year and once a month.<sup>17</sup> 53% are White, 39% are Asian/Pacific Islander, 5% are Black, and 5% are Hispanic.<sup>18</sup> After work has been completed, according to the original expiry date listed on the LMI, bonuses are calculated and workers are notified of their earnings. Note that tournament winners and losers do not know their status at the time they are queried about their normative commitments.

In the basic specification, I examine the effect of one treatment stratification at a time:

$$Utilitarian_{it} = \beta_1 Treatment_t + \beta_2 X_{it} + \varepsilon_{it} \quad (1)$$

where  $Utilitarian_{it}$  represents the utilitarian choice in the moral trolley problem for individual  $i$  in treatment  $t$ ,  $Treatment_t$  represents one of the three possible stratifications (*Competition* versus *Piece-Rate* market experience, *Bystander* versus *Footbridge scenario*, and *Light* versus *Dark Illustration* of the moral trolley problem), and  $X_i$  represents individual demographic characteristics. In some specifications,  $Utilitarian_{it}$  is replaced by  $Donate_{it}$ , which represents the decision to donate by individual  $i$  in treatment  $t$ . My 2x2x2 experimental design allows me to investigate heterogeneous treatment effects, so I can interact treatments with each other (e.g. *Competition* with *Footbridge scenario* or with *Dark Illustration*) in order to investigate the effect of competition on other-regarding preferences. Including the controls  $X_i$  will generally reduce the standard errors of the treatment effect being considered if the controls are significant predictors of the outcome variable because of the random assignment of workers to treatment conditions. For instance, since the *Footbridge scenario* strongly negatively predicts the *Utilitarian* choice, *Footbridge scenario* will always be controlled for when predicting *Utilitarian*

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<sup>17</sup> I did not inquire about subjects' previous experience with the moral trolley problem, but exposure to moral philosophy has not been found to affect decision-making in the moral trolley problem (Hauser, Cushman, Young, Jin, Mikhail 2007).

<sup>18</sup> Most workers have a college education and the income distribution of workers follows the income distribution in the US (<http://behind-the-enemy-lines.blogspot.com/2008/03/mechanical-turk-demographics.html>).

in the analyses below.

## IV. Results

### A. The Effect of Competition on Utilitarian Values

Competition increases deontological commitments, particularly in the footbridge scenario. This finding can be seen in Figure 9, which displays for each treatment interaction, the percentage of workers making utilitarian choices in the moral trolley problem. 38 out of 44 workers (86%) in the tournament setting decided that pushing someone to his death to save five others is morally impermissible. 26 out of 49 workers (53%) in the piece rate setting decided the same. Competition increases deontological commitments even when controlling for demographic characteristics. Table 2 displays estimates of the specification:

$$\begin{aligned} Utilitarian_{it} = & \beta_1 Competition_t + \beta_2 DeontologicalScenario_t \\ & + \beta_3 Competition_t \cdot DeontologicalScenario_t + \beta_4 X_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

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). 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 piece rate workers (Column 2). Controlling for the footbridge scenario, other treatments, and demographic characteristics strengthens the impact of competition on utilitarian values (Columns 3 and 5). Interacting the competition treatment and the footbridge scenario treatment indicates that workers are 46% less likely to choose the utilitarian option in the Footbridge scenario than in the Bystander scenario (Column 8), but piece rate workers are 38% more likely to make the utilitarian choice in the

Footbridge scenario than tournament workers. Comparable estimates for  $\beta_3$  are found in Columns 4 and 6. The increase in deontological commitments by tournament workers is therefore particularly strong when workers respond to the footbridge scenario.

### **B. The Effect of Competition on Other-Regarding Preferences**

I find some evidence that the kind of market experiences affects other-regarding preferences. To investigate whether market experiences increase utilitarian commitments towards outgroups, I estimate the following specification:

$$\begin{aligned} Utilitarian_{it} = & \beta_1 White_{it} + \beta_2 DarkIllustration_t + \beta_3 Competition_t + \\ & \beta_4 White_{it} \cdot DarkIllustration_t + \beta_5 White_{it} \cdot Competition_t + \\ & \beta_6 DarkIllustration_t \cdot Competition_t + \beta_7 White_{it} \cdot DarkIllustration_t \cdot Competition_t + \\ & \beta_8 X_{it} + \beta_9 DeontologicalScenario_t + \varepsilon_{it} \end{aligned} \quad (3)$$

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 competition increases utilitarian commitments towards outgroups. As Table 3 illustrates, White workers are 38% more likely than non-White workers to make the utilitarian choice when presented a dark-skinned illustration and in the piece rate setting, but they are 24% less likely to make the utilitarian choice when presented a dark-skinned illustration in the tournament setting (0.384 – 0.627 in Column 6). Comparable estimates are found for  $\beta_7$  in Columns 2 and 4. This effect is shown in Figure 10 to come more strongly from non-Whites (47% of the sample). The fifth and seventh bar indicate that non-Whites particularly become more deontological towards out-group members (light

illustration) with competition. 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. Thus far, these results indicate that piece rate workers display more utilitarian commitments and more utilitarian commitments towards outgroups than tournament workers.

The aforementioned specification in equation (3) actually tests three hypotheses simultaneously, whether the color of the figures in the moral trolley illustration primes outgroup considerations, whether individuals are more utilitarian towards outgroups, and whether market interactions affect how utilitarian individuals are towards outgroups. Equation (3) does not independently show whether the dark-skinned illustration primes outgroup considerations for Whites (and the light-skinned illustration primes outgroup considerations for non-Whites). To validate that the moral trolley illustrations do in fact prime outgroup considerations, I estimate:

$$Donate_{it} = \beta_1 White_i + \beta_2 DarkIllustration_t + \beta_3 White_i \cdot DarkIllustration_t + \beta_4 X_{it} + \varepsilon_{it} \quad (4)$$

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 4) and the dark-skinned illustration does not generally affect donations to the Red Cross or Red Crescent (Column 2). However, as Columns 3-5 in Table 4 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 are when presented a dark-skinned illustration of the moral trolley problem than when presented a light-skinned

illustration. Figure 11 graphically displays the differences-in-differences analyses of the effect of outgroup priming on charitable donations. This finding is to be expected as the illustration of these individuals can prime workers to think that their donations are helping individuals of the race in the illustration, much like how campaign or donation ads can prime racial attitudes by tying particular narratives to the race of individuals in those narratives (Valentino, Hutchings, and White 2004, Fong and Luttmer 2009).

### C. The Effect of Competition 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 5), as can be seen from estimating:

$$Donate_{it} = \beta_1 Competition_i + \beta_2 X_{it} + \varepsilon_{it} \quad (5)$$

An important outcome to study in the effect of competition 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 6 presents estimates of the specification:

$$Donate_{it} = \beta_1 Competition_i + \beta_2 X_{it} + \varepsilon_{it} \quad (6)$$

where  $\beta_1$  is the coefficient of interest. I restrict to the sample of individuals in the competition 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. This finding sharply contrasts with literature that claims that earned property rights decrease generosity (e.g. Hoffman, McCabe, Shachat and Smith 1994). This apparent inconsistency may be attributable to subjects knowing that they have earned additional income in laboratory studies as opposed to workers not knowing that they have won their tournament in my study. Whether

the result that tournament winners donate more generalizes to the real world depends a great deal on whether actual market winners are aware or unaware of being the winners when making the decision to be charitable. These findings are, however, consistent with the theory that competition fosters empathy, not among the competitors, but between competitors and third parties (Hirschman 1982), since the beneficiary of donations in my study is the Red Cross / Red Crescent, not other participants in the experiment, at least for tournament winners. Furthermore, tournament winners are slightly more deontological but not significantly so (Columns 4-6 of Table 6). The slight propensity of tournament winners towards deontological behavior also suggests that the main effect of competition on deontological values found in Table 2 comes from switching between piece rate and competition rather than between the winners and losers of a tournament.

Do tournament winners donate more in the forgoing analysis because productive workers are more generous or because competition caused productive workers to become more generous? As falsification check, I examine the behavior of workers who would have been tournament winners but were assigned to the non-tournament condition. Table 7 repeats the analyses of Table 6 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 the piece rate treatment. Columns 1-3 of Table 7 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 6. Figure 12 graphically displays the differences-in-differences analysis of the effect of tournaments on charitable donations by tournament winners. In sum, these results suggest that, rather than encouraging workers who are *generally* productive to donate, competition specifically encourages workers who are productive *during tournaments* to

donate. This distinction should be investigated in future research.

#### **D. The Effect of Competition on Productivity**

Competition 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 (Columns 1 and 2 of Table 8). Table 8 presents estimates of the specification:

$$\text{LogError}_{it} = \beta_1 \text{Competition}_i + \beta_2 X_{it} + \varepsilon_{it} \quad (7)$$

Log errors are calculated from post-treatment data entry, i.e. the last three paragraphs. I restrict the sample to non-attriters. The effect is still robust when controlling for log error rates from the first three paragraphs, 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 the treatment is revealed, and, in fact, a formal estimation confirms that treatment does not affect pre-treatment error rates (Column 4). The magnitudes are sizeable. The average log post-treatment error rate is 2.8 for non-attriters, so the coefficient of 0.37 in Column 3 suggests that piece rate conditions increase log error rates by 13%.

My findings and that of Gneezy, Niederle and Rustichini (2001) (finding that males respond more to tournament incentives than do females<sup>19</sup>) contrast with Bandiera, Barankay, and Rasul (2005), who do not find that relative incentives improve output. One possible reason for the difference may be that, in their seminal study of fruit-pickers, workers are aware of the management experiment being imposed, and this awareness may inspire workers who prefer one payment scheme (e.g. piece rate) to perform better. Another reason may be that the social

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<sup>19</sup> Males respond to tournament incentives more than do females in my study as well.



preferences highlighted in their study may be particularly relevant because workers live together in enclaves while fruit-picking for many months. Living together in enclaves for many months may have caused fruit-pickers to internalize the negative externality that competition imposes on other workers. By contrast, workers may not internalize the negative externality that competition imposes on other workers in the anonymous setting of a LMI.

### **E. The Effect of Competition on Utilitarian Values over Economic Development**

One distinction between the labor market intermediary in my study and the laboratories in experimental economics studies is the global labor supply, allowing the exploration of heterogeneous treatment effects, and in this application, the intellectual history of the *doux commerce* thesis. In the early stages of economic development, economists thought that commerce increased morality, but in the later stages of economic development, economists thought commerce decreased morality (Hirschman 1982). The effect of competition on deontological commitments appears to reverse with income of the worker's country, even though the transcription task is designed to be culturally neutral and the moral trolley problem has been found to be culturally neutral (Mikhail 2007). As to why workers from countries at different stages of economic development may respond differently, perhaps competition triggers the emotions at an early stage of economic development, but it does not at a later stage of economic development, particularly the elevated emotions that *doux commerce* scholars were concerned about. It is possible that market competition is perceived to be unfair early in the course of economic development, thereby triggering emotions, particularly negative emotions. The distance between individual effort and pay is correlated with unhappiness (see, e.g. DeVoe and Pfeffer 2009). Negative emotions can cause deontological responses to moral judgments

(Wheatley and Haidt 2005, Schnall, Haidt and Clore 2005). As markets develop, however, competition becomes perceived as fair or, at least, unsurprising. This perspective provides an economic rationale for the intellectual history of the *doux commerce* thesis.

To explore whether the effect of competition on utilitarian values changes for workers from high-income countries, Table 9 displays estimates of the specification:

$$\begin{aligned} Utilitarian_{it} = & \beta_1 Competition_t + \beta_2 LnGDP_{it} \\ & + \beta_3 Competition_t \cdot LnGDP_{it} + \beta_4 X_{it} + \beta_5 DeontologicalScenario_t + \varepsilon_{it} \end{aligned} \quad (8)$$

where  $\beta_3$  is the coefficient of interest. Income data is obtained from the World Economic Outlook Database (IMF 2009).<sup>20</sup> As documented above, for the entire sample, exposure to the piece rate condition 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 competition on increasing deontological values may reverse with income, 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 competition on utilitarian commitments reverses. This reversal is 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 above 30,000.<sup>21</sup> However, the estimates of  $\beta_3$  should be considered cautiously as, despite the design of the transcription task to be culturally neutral and the cultural neutrality of the moral trolley problem (Mikhail 2007), correlates of income could explain this reversal. When being American or Indian are also

<sup>20</sup> <http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx>

<sup>21</sup> Bahrain, Canada, France, Germany, Netherlands, Switzerland, and USA 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.

interacted with market interaction,  $\beta_3$  weakens in statistical significance. The effect of competition on donations does not appear to be related to income (Columns 6-10).

## **V. Limitations and Alternative Theories**

In this section, I consider a number of limitations and alternative theories for the findings in this paper. First, the brevity of the study makes it more akin to a priming experiment (see, e.g. Benjamin, Choi, and Strickland (2009) arguing that the priming of social identity helps examine the causal effect of social identity on preferences). I do not know whether market experience has long-term effects on normative commitments once an individual is removed from that market environment. Relatedly, the individuals participating in the study are already embedded in the market. Individuals may behave differently if moving from not being embedded to being embedded, rather than a marginal intervention that shifts the degree or type of market embeddedness. Moreover, there is no non-market baseline measurement of individuals, either before the study or in a control group that does not face a work experience but is simply asked for their normative commitments. The model in Section II suggests that the effects should be interpreted as the *difference* between the marginal effect of increasing competition on normative commitments and the marginal effect of increasing piece-rate on normative commitments. In the absence of any prime, individuals may have been far more or far less deontological than individuals who were primed, a question that this study cannot answer.

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 LMI experience, where the employer has all the bargaining power (Chen and Horton 2009). 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, making them negatively affected, then this could explain the increase in deontological commitments, since negative emotions can cause deontological responses to moral judgments (Wheatley and Haidt 2005, Schnall, Haidt and Clore 2005). Effort could also impose an additional cognitive load, and cognitive load has been found to interfere with utilitarian moral judgment (Greene, Morelli, Lowenberg, Nystrom, and Cohen 2008). However, the study only suggests a reduced form relationship between tournaments and deontological commitments and is unable to pin down the particular mechanism behind this relationship. Regardless, the results suggest that competition as opposed to piece rate, whether because competition requires more effort, triggers emotions, involves abstract sharing principles (Henrich, Boyd, Bowles, Camerer, Fehr, Gintis, and McElreath 2001), or all three, leads to greater deontological commitments.

Fourth, the global labor supply in the LMI 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, Rilling, Aronson, Nystrom,

and Cohen 2003, Krajbich, Adolphs, Tranel, Denburg, Camerer 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. Requiring data entry of Tagalog transcriptions, which a country's income is unlikely to lend comparative advantage, mitigates this concern.

Fifth, the lock-in task minimizes attrition. But workers may respond to merely a change in contract conditions midway through the experiment rather than a change from piece rate 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 9). Moreover, if workers are offended by the change in contract conditions as they are when they face a wage cut (Chen and Horton 2009), they can quit at any time, yet attrition is on the order of 10% and similar across treatment interactions.

Sixth, attrition is still on the order of 10% and there is the possibility that the workers who attrite in each treatment interaction are different. More precisely, this is only a concern for the first treatment stratification, tournament or piece-rate, 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 in exactly the opposite way to treatment. In the worst case scenario, all tournament workers who attrited after the lock-in task would have made a utilitarian decision and all piece rate workers who attrited after the lock-in task would

have made the deontological decision. Then, for example, the estimates of the effect of competition 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 competition and the footbridge scenario, at 10%, 5%, and 10% statistical significance respectively.<sup>22</sup> The estimates of the effect of competition on deontological commitments towards outgroups 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>23</sup> For the estimates of the effect of competition 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. Still, no income or substitution effects are observed for the Bystander scenario of the trolley problem.

Eighth, these measures of ethical behavior are somewhat decontextualized, like the Implicit Association Test and surveys of time preferences (Beaman, Chattopadhyay, Duflo, Pande, Topalova 2008, Ashraf, Karlan, and Yin 2006). Examining whether competition 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; Chen (2010b) examines whether individuals become less moral when choices are obfuscated, such as when one worker is grading another

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<sup>22</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>23</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.

worker and is responsible for their payment, and competition can be superimposed on this study.

Finally, as delineated in the model in Section II, the study mostly investigates the effect of competition on ethical behavior as compared to piece rate, not the effect of competition or piece rate as compared to the absence of market incentives. This, too, can be investigated in future work, and for example, build on Chen, Horton, and Shaw (2010), which randomizes workers that are inputting data about microfinance institutions to more relational contracts involving normative priming, cheap talk, solidarity, humanization, or promise of future work or more incentive-based contracts involving rewards, punishment, tournaments, or the Bayesian Truth Serum for compliance. Adding a moral trolley problem component would help address this issue.

## **VI. Conclusion**

The increase in deontological values and the increase in deontological values towards outgroups along with the fact that tournament winners are more likely to donate to charity suggests that along both economic and philosophical dimensions, the moral influences of competition are ameliorative, in ways that philosophers and economists have traditionally considered as ameliorative.<sup>24</sup> Importantly, these results suggest that, in studying the effect of market experiences, the role of competition needs to be distinguished from the role of other aspects of the market experience, such as piece rate or commodification, more generally.

The effect of competition on deontological commitments may reverse with income of the worker's country. This reversal suggests that the beneficial effects of market competition on moral values may be particularly strong in developing countries; this hypothesis is consistent

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<sup>24</sup> The philosophy literature tends to connote deontological commitments with ethical behavior (Bartels 2008, Nichols and Mallon 2005).

with earlier studies that found greater cooperation in experimental games in developing societies with greater market integration (Henrich, Boyd, Bowles, Camerer, Fehr, Gintis, and McElreath 2001); and consistent with concerns that market competition may lose moral constraints after a certain level of economic development (Smith 1759). Given the recent debate on the role of ethics from the Enron case to the global financial crisis of 2007-2009, the findings here suggest that restricting bonuses of Wall Street financiers may make them more deontological and duty-oriented: a consequentialist alternative to Kantian arguments in favor of restricting bonus pay (Sandel 2009). Competing in elections may cause judges to become more utilitarian, and the progression of judges towards utilitarianism may characterize the law and economics movement. One prediction is that judges who win close elections may become more extreme in ideology, in contrast to what would be predicted by the median voter theorem. This perspective suggests another reason besides inability to commit (Lee, Moretti, and Butler 2004) as to why competition for votes does not induce politicians to move towards the center.

Competition reduces error rates by one-third, as accuracy is the metric by which workers are compared to other workers in the tournament. If competition increases productive capacity and competition increases deontological commitments but the effect reverses with income, then assuming that utilitarian commitments lead to an increase in competitive market arrangements, a positive feedback can arise between competition, productive efficiency, and utilitarian commitments. At an early stage of economic development, moral values and economic conditions are at a stable steady state: in a poor country, a commodification shock would stimulate workers to become more utilitarian and prefer competitive structures, but this preference for competitive structures undermines the initial commodification shock, a negative feedback making it difficult to transition out of the steady state. However, a competitive shock



sufficiently large would increase growth substantially, and once the effect of competition reverses, a positive feedback arises. Agents in the model that are enthusiastic about market competition, find them fair and therefore become more utilitarian. Meanwhile, agents in the model that are concerned about market inalienability, find market competition unfair and therefore become more deontological over the course of development. As markets increase the returns to productive capacity, more and more people find markets fair and become utilitarian, choosing to impose competitive structures on others. Over time, social systems shift towards market orientation, but deontological commitments become stronger and more intense in a potential race between ideological intensity and extinction (Chen and Lind 2007, Chen 2010, 2007).

## References

**Alesina, Alberto and Edward Glaeser.** 2005. *Fighting Poverty in the US and Europe: A World of Difference*. West Nyack: Cambridge University Press.

**Alter, A. L., J. Kernochan, and J. M. Darley.** 2007. "Morality Influences How People Apply the Ignorance of the Law Defense." *Law and Society Review*, 41(4): 819–64.

**Anderson, Elizabeth.** 1995. *Value in Ethics and Economics*. Cambridge: Harvard University Press.

**Appiah, Kwame A.** 2008. *Experiments in Ethics*. Cambridge: Harvard University Press.

**Ashraf, Nava, Dean Karlan, and Wesley Yin.** 2006. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Phillipines." *Quarterly Journal of Economics* 121: 635-672.

**Autor, David, ed.** 2009. *Studies of Labor Market Intermediation*. Series: National Bureau of Economic Research Conference Report. Chicago: University of Chicago Press.

**Bandiera, Oriana, Iwan Barankay, and Imran Rasul.** 2005. "Social Preferences and the Response to Incentives: Evidence from Personnel Data." *The Quarterly Journal of Economics*, 120: 917-962.

**Bandiera, Oriana, Iwan Barankay, and Imran Rasul.** 2007. "Incentives for Managers and Inequality Among Workers: Evidence From a FirmLevel Experiment." *The Quarterly Journal of Economics*, 122: 729-773.

**Bandiera, Oriana, Iwan Barankay, and Imran Rasul.** 2009. "Social Connections and Incentives: Evidence from Personnel Data." *Econometrica*, 77: 1047-1094.

**Bartels, Daniel M.** 2008. "Principled Moral Sentiment and the Flexibility of Moral Judgment and Decision Making." *Cognition*, 108: 381-417.

**Beaman, Lori, Raghavendra Chattopadhyay, Esther Duflo, Rohini Pande, and Petia Topalova.** 2008. "Powerful Women: Does Exposure Reduce Bias?" *The Quarterly Journal of Economics*, 1497-1540.

**Benjamin, Daniel J., James J. Choi, and A. Joshua Strickland.** 2009. "Social Identity and Preferences." *The American Economic Review*, 99(1): 431–457.

**Bisin, Alberto and Thierry Verdier.** 2001. "The Economics of Cultural Transmission and the Dynamics of Preferences." *Journal of Economic Theory*, Elsevier. 97(2): 298-319.

**Bloom, N., B. Eifert, A Mahajan, D. McKenzie, and J. Roberts.** 2009. "Management as a Technology: Evidence from Indian Firms". Stanford.

**Bowles, S.** 1998. "Endogenous Preferences: The Cultural Consequences of Markets and Other Economic Institutions." *Journal of Economic Literature*, 36:75–111.

**Bowles S.** 2008. "Policies Designed for Self-Interested Citizens May Undermine "The Moral Sentiments": Evidence from Economic Experiments." *Science*, 320: (5883)1605.

**Bowles, S. and S. Hwang.** 2008. "Social Preferences and Public Economics: Mechanism Design When Social Preferences Depend on Incentives." *Journal of Public Economics*, 92(8-9):1811-1820.

**Brandts, J. and G. Charness.** 2004. "Do Labour Market Conditions Affect Gift Exchange? Some Experimental Evidence." *Economic Journal*, 114(497): 684-708.

**Camerer, C.F.** 2003. *Behavioral Game Theory: Experiments in Strategic Interaction*. New York: Russell Sage Foundation. Princeton University Press.

**Carpenter, Jeffrey.** 2005. "Endogenous Social Preferences," *Review of Radical Political Economics*, 37(1):63-84 (Winter, 2005).

**Chen, Daniel L.** 2010. "Club Goods and Group Identity: Evidence from Islamic Resurgence During the Indonesian Financial Crisis." *Journal of Political Economy*, 118(2): 300-354.

**Chen, Daniel L.** 2010. "Egoism vs. Altruism: Do Individuals Become Less Moral When Choices are Obfuscated." Harvard Law School, working paper.

**Chen, Daniel L., J. Horton, and A. Shaw.** 2009. "Epistemic Crowdsourcing: Motivation vs. Incentives." Harvard University, working paper.

**Chen, Daniel L.** 2007. "Islamic Resurgence and Social Violence During the Indonesian Financial Crisis." *Institutions and Norms in Economic Development*. Mark Gradstein and Kai A. Konrad, eds. 179-200. Cambridge, MA: MIT Press.

**Chen, Daniel L., A. Dreber, J. Horton, and D. Rand.** 2009. "The 21<sup>st</sup> Century Mechanical Turk: A True Automaton for Running Experimental Games on the Internet." Harvard University, working paper.

**Chen, Daniel L. and Jo Lind.** 2007. "Religion, Welfare Politics, and Church-State Separation." *Journal of Ecumenical Studies*, 42(1): 42-52.

**Chen, Daniel L. and John Horton.** 2009. "The Wages of Pay Cuts: Evidence From a Field Experiment." Harvard University, working paper.

**Chen, Daniel L. and John Horton.** 2009. "The Economics of Crowdsourcing: A Theory of Disaggregated Labor Markets." Harvard University, working paper.

**Chen, Yan and Sherry Xin Li.** 2009. "Group Identity and Social Preferences." *American Economic Review*, 99,(1): 431-457.

**Copp, David.** 2010. "Experiments, Intuitions, and Methodology in Moral and Political Theory." UC Davis Working Paper.

**Cushman, F. A., L. Young, and M. D. Hauser.** 2006. "The Role of Reasoning and Intuition in Moral Judgments: Testing Three Principles of Harm." *Psychological Science*, 17(12): 1082–89.

**Cushman, F. A., L. Young, and J. D. Greene.** 2009. "Our multi-system moral psychology: Towards a consensus view." Harvard University Working paper.

**Detert, James R., Linda Klebe Treviño, and L.Vicki Sweitze,** 2008. "Moral Disengagement in Ethical Decision Making: A study of Antecedents and Outcomes." *Journal of Applied Psychology*, 93(2): 374-391.

**DeVoe, Sanford.** 2009. "When Is Happiness About How Much You Earn? The Effect of Hourly Payment on the Money-Happiness Connection." *Personality and Social Psychology Bulletin*, 35(12): 1602-1618.

**DiNardo, John, Justin McCrary, Lisa Sanbonmatsu.** 2006. "Constructive Proposals for Dealing with Attrition: An Empirical Example." University of Michigan, working paper.

**Di Tella, Rafael, Sebastian F. Galiani, and Ernesto S. Schargrodsky.** 2007. "The Formation of Beliefs: Evidence from the Allocation of Land Titles to Squatters." *Quarterly Journal of Economics*, 122(1): 209-241.

**Doris, J.** 2002. *Lack of Character: Personality and Moral Behavior*. New York: Cambridge University Press.

**Dubinsky, Alan J., Thomas N. Ingram.** 1984. "Correlates of Salespeople's Ethical Conflict: An Exploratory Investigation." *Journal of Business Ethics*, 3(4): 343-353.

**Echebarria-Echabe, Agustin; Guede, Emilia Fernández.** 2003. "Extending the Theory of Realistic Conflict to Competition in Institutional Settings: Intergroup Status and Outcome." *Journal of Social Psychology*, 143(6): 763-782.

**Eriksson, Tor and M. Villeval.** "Other-Regarding Preferences and Performance Pay—An Experiment on Incentives and Sorting." *Journal of Economic Behavior and Organization*, 2008, 68 (2), 412-421

**Fletcher, Thomas D., David N. Nusbaum.** 2008. "Trait Competitiveness as a Composite Variable: Linkages with Facets of the Big-five." *Personality and Individual Differences*, 45(4): 312-317.

**Fisman, Raymond, Shachar Kariv, and Daniel Markovits.** 2009. "Exposure to Ideology and

Distributional Preferences.” Yale Law School Working Paper. C79, C91, D64.

**Foot, P.** 1967. “The Problem of Abortion and the Doctrine of Double Effect.” *Oxford Review*, 5: 5–15.

**Fong, Christina and Erzo Luttmer.** 2009. “What Determines Giving to Hurricane Katrina Victims? Experimental Evidence on Racial Group Loyalty.” *American Economic Journal: Applied Economics*, 1(2): 64-87.

**Ford, Robert C. and Woodrow D Richardson.** 1994. “Ethical Decision Making: A Review of the Empirical Literature.” *Journal of Business Ethics*, 13(3): 205-221.

**Freeman, Richard and Alex Gelber.** 2009. “Prize Structure and Information in Tournaments: Experimental Evidence.” *American Economic Journal: Applied Economics*.

**Gneezy, Uri, Muriel Niederle, Aldo Rustichini.** 2003. “Performance in Competitive Environments: Gender Differences.” *Quarterly Journal of Economics*, 118(3): 1049-1074.

**Gneezy, Uri and Aldo, Rustichini.** 2000. “A Fine is a Price.” *Journal of Legal Studies*, 29(1).

**Goldin, Claudia and Lawrence F. Katz.** 2002. “The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions.” *Journal of Political Economy*, 110(4): 730-770.

**Gorr, Michael.** 1990. “Thomson and the Trolley Problem.” *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition*, 59(1): 91-100.

**Greene, Joshua D., D. Lindsell, A. C. Clarke, L. E. Nystrom, and J. D. Cohen.** 2010. “What Pushes your Moral Buttons? Modular Myopia and the Trolley Problem.” Working paper.

**Greene, J. D., Morelli, S. A., Lowenberg, K., Nystrom, L. E., & Cohen, J. D.** 2008. “Cognitive load selectively interferes with utilitarian moral judgment.” *Cognition*, 107, 1144-1154.

**Greene, Joshua D., Leigh E. Nystrom, Andrew D. Engell, John M. Darley and Jonathan D. Cohen.** 2004. “The Neural Bases of Cognitive Conflict and Control in Moral Judgment.” *Neuron*, 44(2) 389–400.

**Greene, Joshua D., R. Brian Sommerville, Leigh E. Nystrom, John M. Darley and Jonathan D. Cohen.** 2001. “An fMRI Investigation of Emotional Engagement in Moral Judgment.” *Science*, 293(5537):2105–2108.

**Haidt, J.** 2001. “The Emotional Dog and Its Rational Tail: A Social Intuitionist Approach to Moral Judgment.” *Psychological Review*, 108(4): 814–834.

**Harrison, Glenn and John List.** 2004. “Field Experiments.” *Journal of Economic Literature*, 42(4): 1009-1055.

- Hart, O., A. Shleifer, and R.W. Vishny.** 1997. "The Proper Scope of Government: Theory and Application to Prisons". *Quarterly Journal of Economics*. Working Paper 5744. 112(4): 1127--1161.
- Hauser, M. D.** 2006. *Moral Minds: How Nature Designed a Universal Sense of Right and Wrong*. New York: Harper Collins.
- Hauser, M. D., Cushman, F. A., Young, L., Jin, R., & Mikhail, J. M.** 2007. "A dissociation between moral judgment and justification." *Mind and Language*, 22(1), 1-21.
- Hayek, F.** 1948. *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Horton, John, D. Rand, and R. Zeckhauser.** 2010: "The Online Laboratory: Conducting Experiments in a Real Labor Market." NBER Working Paper w15961. 1-36.
- Houser, Daniel, Erte Xiao, Kevin McCabe and Vernon Smith.** 2008. "When Punishment Fails: Research on Sanctions, Intentions and Non-operation." *Games and Economic Behavior*, 62(2), 509-532.
- Hegarty, W. H. and H. P.Sims.** 1978. "Some Determinants of Unethical Decision Behavior-Experiment." *Journal of Applied Psychology*, 63(4): 451-457.
- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, and Richard McElreath.** 2001. "In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies." *American Economic Review*, 91(2): 73-78.
- Hirschman, Albert O.** 1982. "Interpretations of Market Society: Civilizing, Destructive, or Feeble?" *Journal of Economic Literature*, 20(4): 1463-1484.
- Hoffman, Elizabeth, Kevin McCabe, Keith Shachat and Vernon Smith.** 1994. "Preferences, Property Rights and Anonymity in Bargaining Games." *Games and Economic Behavior*, 7: 346-380.
- Kahneman, D. and A. Tversky,** 1984. "Choices, Values and Frames." *American Psychologist*, 30: 341-350.
- Kelman, M., Y. Rottenstreich, and , A. Tversky** 1996. "Context-Dependence in Legal Decision Making." *Journal of Legal Studies*, 25: 287.
- Kennedy, James, and Walter Stephen.** 1977. "The Effects of Cooperation and Competition on Ingroup-Outgroup Bias." *Journal of Applied Social Psychology*, 7(2): 115-130.
- Koenigs, M., L. Young, R. Adolphs, D. Tranel, F. A. Cushman, M. D. Hauser, A. Damasio.** 2007. "Damage to the Prefrontal Cortex Increases Utilitarian Moral Judgments." *Nature*, 446: 908-911.

- Kohn, A.** (1986). *No contest: The case against competition*. Boston: Houghton Mifflin.
- Knoch D, A. Pascual-Leone, K. Meyer, V. Treyer, E. Fehr.** 2006. "Diminishing Reciprocal Fairness by Disrupting the Right Prefrontal Cortex." *Science* 3 (5800), 314:829–832.
- Lee, David S., Enrico Moretti, and Matthew Butler.** 2004. "Do Voters Affect or Elect Policies? Evidence from the U.S. House." *Quarterly Journal of Economics*, 119(3): 807-859.
- Lemieux, Thomas, W. Bentley MacLeod, and Daniel Parent.** 2009. "Performance Pay and Wage Inequality." *Quarterly Journal of Economics*, 124(1): 1-49.
- Levenshtein, V.I.** 1966. "Binary Codes Capable of Correcting Deletions, Insertions, and Reversals." *Soviet Physics-Doklady*. 10(8): 707–710.
- Listokin, Yair.** 2010 "The Meaning of Contractual Silence: A Field Experiment." Yale Law and Economics Research Paper No. 400. *The Journal of Legal Analysis*.
- Mankiw, N. G; and M. C. Weinzierl.** 2010. "The Optimal Taxation of Height: A Case Study of Utilitarian Income Redistribution." *American Economic Journal: Economic Policy*, 2(1): 155-176.
- Marx, Karl.** 1867. *Das Kapital*.
- McCloskey, Deirdre.** 2006. *The Bourgeois Virtues*. Chicago: University of Chicago Press.
- Mikhail, John.** 2007. "Universal Moral Grammar: Theory, Evidence and the Future." *Trends in Cognitive Sciences*." 11(4): 143-152.
- Mill, John Stuart.** 1848. *Principles of Political Economy*. London. Longmans, Green and Co.
- Miller, Greg.** 2008. "Neurobiology: The Roots of Morality." *Science* 320 (5877) ; 9 May 2008.
- Montesquieu, Charles de Secondat, Baron de.** 1748. *The Spirit of Laws*. France.
- Nichols, Shaun and Ron Mallon.** 2005. "Moral Dilemmas and Moral Rules." *Cognition*, 100(3): 530-542.
- Niederle, Muriel, and Lise Vesterlund.** 2007. "Do Women Shy Away from Competition? Do Men Compete too Much?" *Quarterly Journal of Economics*, 122(3): 1067-1101.
- Nussbaum, Martha C.** 1998. "Whether from Reason or Prejudice": Taking Money for Bodily Services. *Journal of Legal Studies*, 27(2): 693-724.
- Orne, M.T.** 1962. "On the Social Psychology of the Psychological Experiment: With Particular

Reference to Demand Characteristics and Their Implications.” *American Psychologist*, 17: 776-783.

**Paine, Thomas.** 1792. *The Rights of Man*. Boston.

**Paolacci, G., Chandlery, J., and Ipeirotis, P.** 2010. “Running Experiments on Amazon Mechanical Turk.” NYU Working Paper.

**Petrinovich, O’Neill, and Jorgenson.** 1993. “An Empirical Study of Moral Intuitions: Towards an Evolutionary Ethics,” *Journal of Personality and Social Psychology* 64: 467-478.

**Petrinovich and O’Neill.** 1996. “Influence of Wording and Framing Effects on Moral Intuitions.” *Ethology and Sociobiology* 17: 145-171.

**Polanyi K.** 1944. *The Great Transformation*. Boston: Beacon.

**Posner, Richard.** 1999. *The Problematics of Moral and Legal Theory*. Cambridge: Harvard University Press.

**Prinz, Jesse J.** 2007. *The Emotional Construction of Morals*, New York: Oxford University Press.

**Radin, Margaret Jane.** 1987. “Market-Inalienability.” *Harvard Law Review* 100: 1849-1937.

**Reips, U.D.** 2001. “The Web Experimental Psychology Lab: five years of data collection on the Internet.” *Behavior Research Methods, Instruments, & Computers*, 33: 201-211.

**Robinson, P. H., R Kurzban, and O. D Jones.** 2008. “The Origins of Shared Intuitions of Justice.” *Vanderbilt Law Review*, 60(6): 1633–1688.

**Rosenberg, Nathan.** 1964. "Neglected Dimensions in the Analysis of Economic Change." *Oxford Bull Economic Statistics*, 26(1): 59-77.

**Rosenthal, R.** 1966. *Experimenter Effects in Behavioral Research*. New York:Appleton-Century-Crofts.

**Roth, Alvin E.** 2007. "Repugnance as a Constraint on Markets *Journal of Economic Perspectives*, American Economic Association, 21(3): 37-58.

**Roth, Alvin E. and J. Keith Murnighan.** 1982. “The Role of Information in Bargaining: An Experimental Study.” *Econometrica*, 50(5): 1123– 1142.

**Schumpeter, Joseph A.** 1942. *Capitalism, Socialism and Democracy*. NY: Harper.

**Sandel, Michael.** 2009. *Justice: What’s the Right Thing to Do?* New York: Farrar, Straus, and



Giroux.

**Sanfey AG, J. K. Rilling, J. A. Aronson, L. E. Nystrom, and J. D. Cohen.** 2003. "The Neural Basis of Economic Decision-making in the Ultimatum Game." *Science*, 300:1755–58.

**Schnall, S., J. Haidt, G. L. Clore, and H. Jordan.** 2008. "Disgust as Embodied Moral Judgment." *Personality and Social Psychology Bulletin*, 34(8): 1096–1109.

**Shleifer, Andrei.** 2004. "Does Competition Destroy Ethical Behavior?" *American Economic Association Papers and Proceedings*, 94(2): 414-418.

**Simmel, Georg.** 1955. "*Conflict and the Web of Group Affiliations*." Trans.: Kurt H. Wolff. Glencoe, IL: The Free Press.

**Smith, Vernon.** 1998, "The Two Faces of Adam Smith." *Southern Economic Journal*, 65(1):1-19.

**Solum, L.** 2006. "Natural Justice." *American Journal of Jurisprudence*, 51: 65–105.

**Spamann, Holger.** 2001. "A Note on Bases of Arguments and Disagreement in the Commodification Debate – the Example of Prostitution." Harvard Law School

**Stigler, George J. and Gary S. Becker.** 1977. "De Gustibus Non Est Disputandum". *American Economic Review*, 67(2): 76-90.

**Sunstein, C.** 2005. "Moral Heuristics." *Behavioral and Brain Sciences*, 28(4): 531–573.

**John Templeton Foundation.** 2008. Does the free market corrode moral character? Thirteen views on the question. <http://www.templeton.org/market/>

**Tetlock, P.E., O. Kristel, B. Elson, M. Green, and J. Lerner.** Forthcoming. "The Psychology of the Unthinkable: Taboo Trade-Offs, Forbidden Base Rates, and Heretical Counterfactuals." *Journal of Personality and Social Psychology*.

**Thompson, J.J.** 1985. "The Trolley Problem." *The Yale Law Journal*, 94(6): 1395–1415.

**Titmuss, R.M.** 1970. *The Gift Relationship: From Human Blood to Social Policy*. Allen and Unwin, London.

**Unger, P.** 1996. *Living High and Letting Die: Our Illusion of Innocence*. Oxford: Oxford University Press.

**Valdesolo, P., and D. DeSteno.** 2006. "Manipulations of Emotional Context Shape Moral Judgment." *Psychological Science*, 17(6):476-477.

**Valentino, Nicholas, A. Vincent, L. Hutchings, and Ismail K. White.** 2004. "The Centrality of Race in American Politics." *Annual Review of Political Science*. Cambridge University Press, 7: 383-408.

**Veblen T.** 1994 (1899). *The Theory of the Leisure Class*. London: Penguin Books.

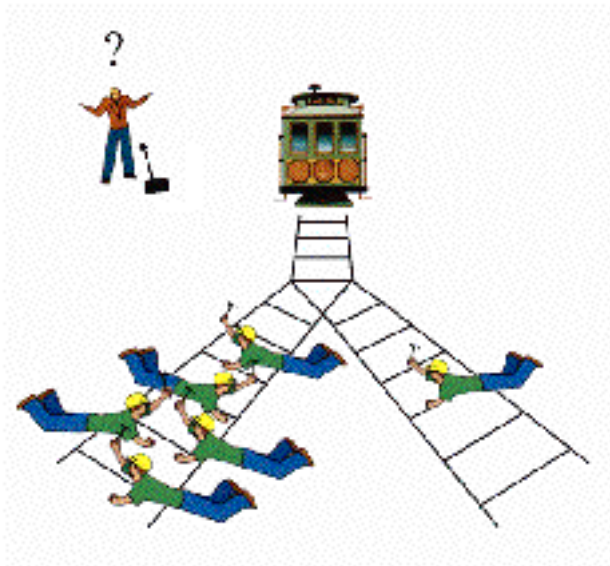
**Wellman, H. and J. Miller.** 2008. "Including Deontic Reasoning as Fundamental to Theory of Mind." *Human Development*, 51(2): 105–135.

**Wheatley, T., and J. Haidt.** (2005). "Hypnotic Disgust Makes Moral Judgments More Severe." *Psychological Science*, 16(10): 780-784.

**Young, L. and R. Saxe.** 2008. "The Neural Basis of Belief Encoding and Integration in Moral Judgment." *NeuroImage*, 40: 1912–20.

Figure 1: Moral Trolley Problem

Light

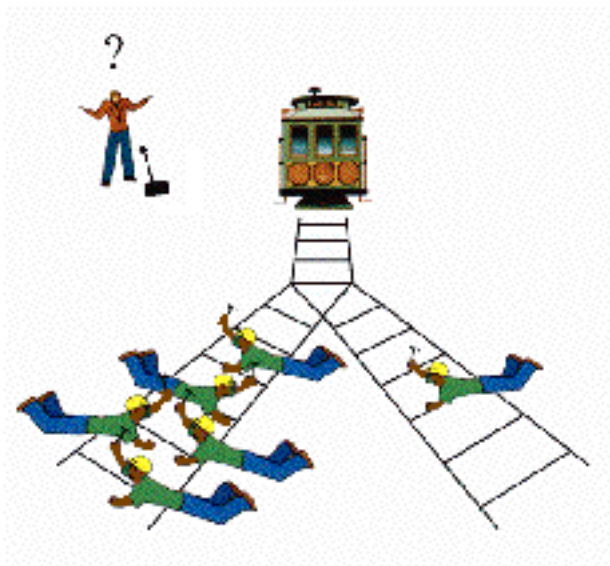


Bystander



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?”

Figure 2: Example of Task

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.

Figure 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:

## Figure 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?

### **Figure 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.

## **Figure 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.

## **Figure 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.

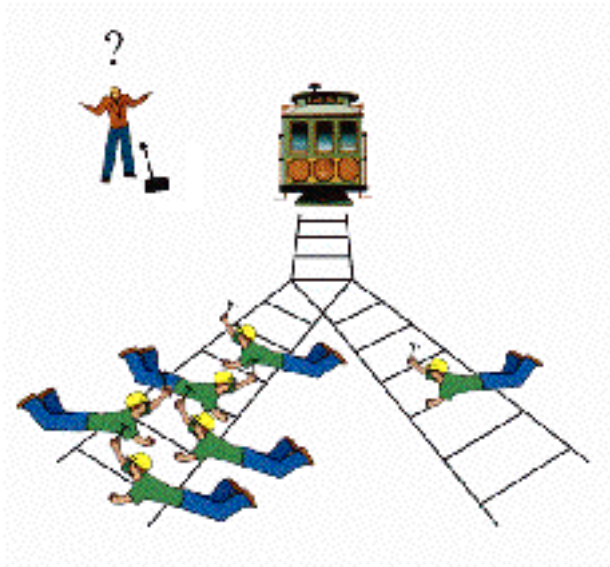
Note: Once you click "Next" you will not be able to navigate to previous pages.



## Figure 5: Moral Trolley Problem

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

Light

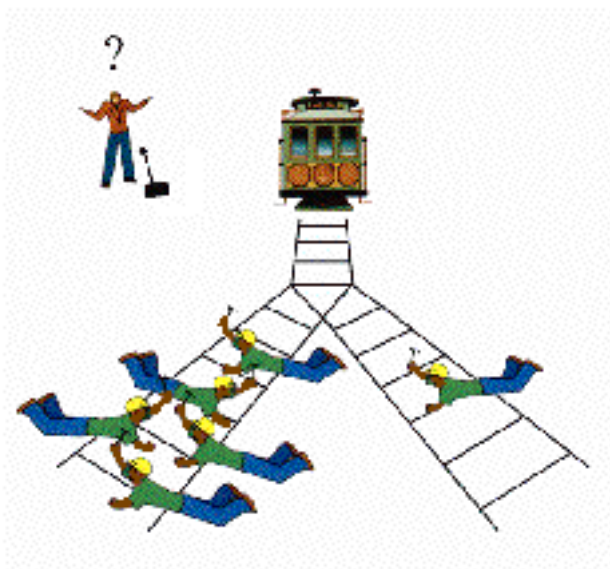


Bystander



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

## **Figure 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

## **Figure 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

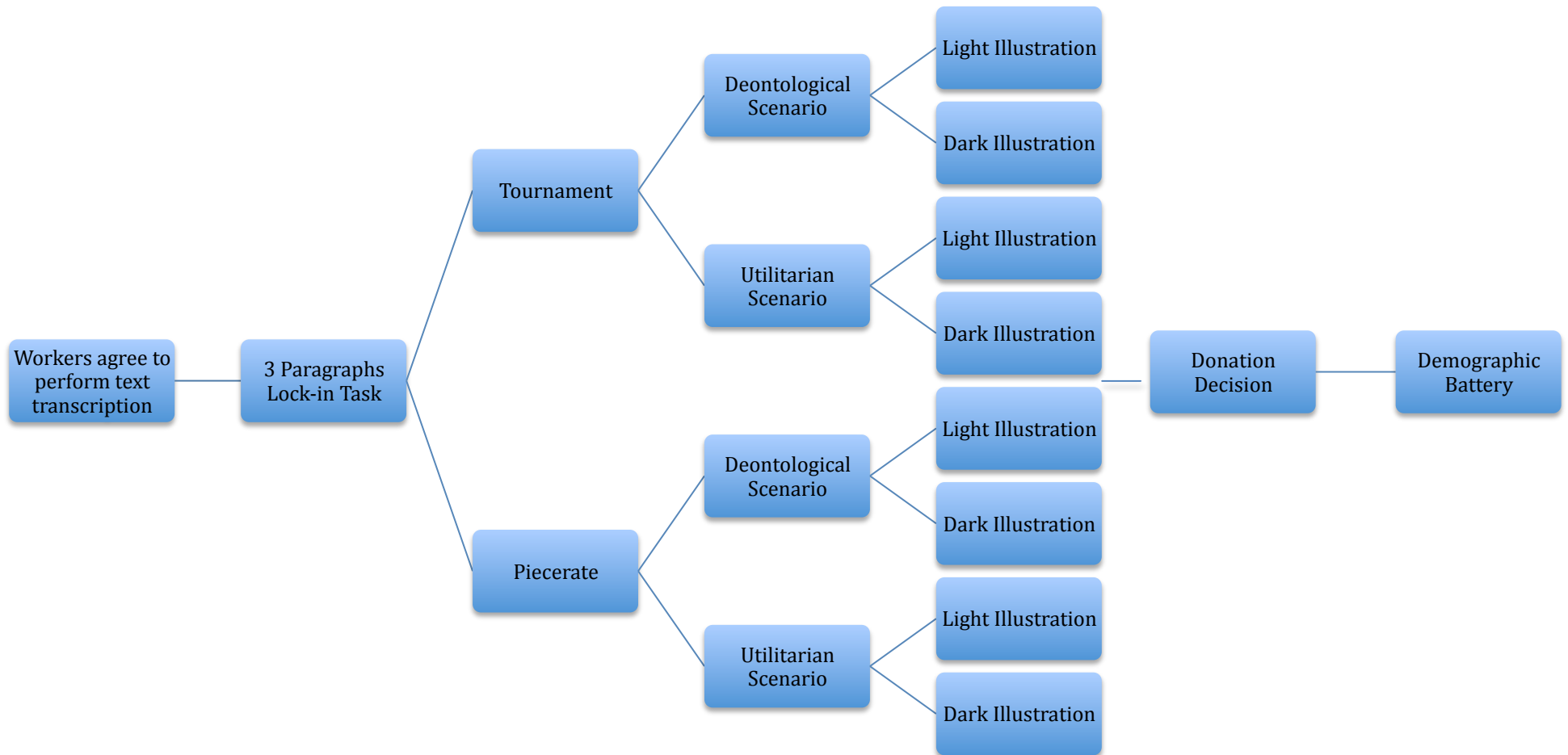
Hispanic

Native American

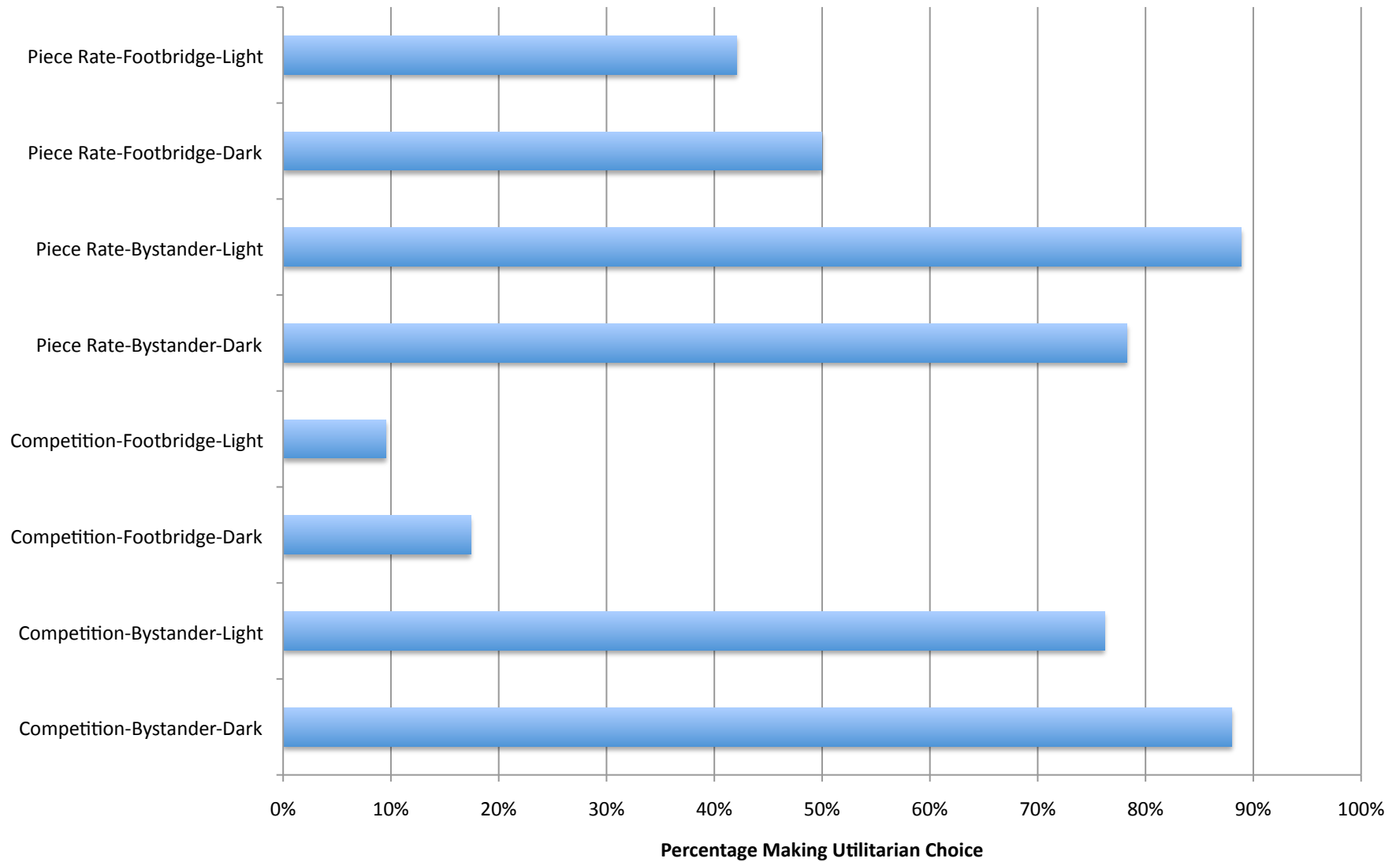
Please click on this link to get your completion code (it will open as a new window):

Enter the code below AND on the Mechanical Turk website.

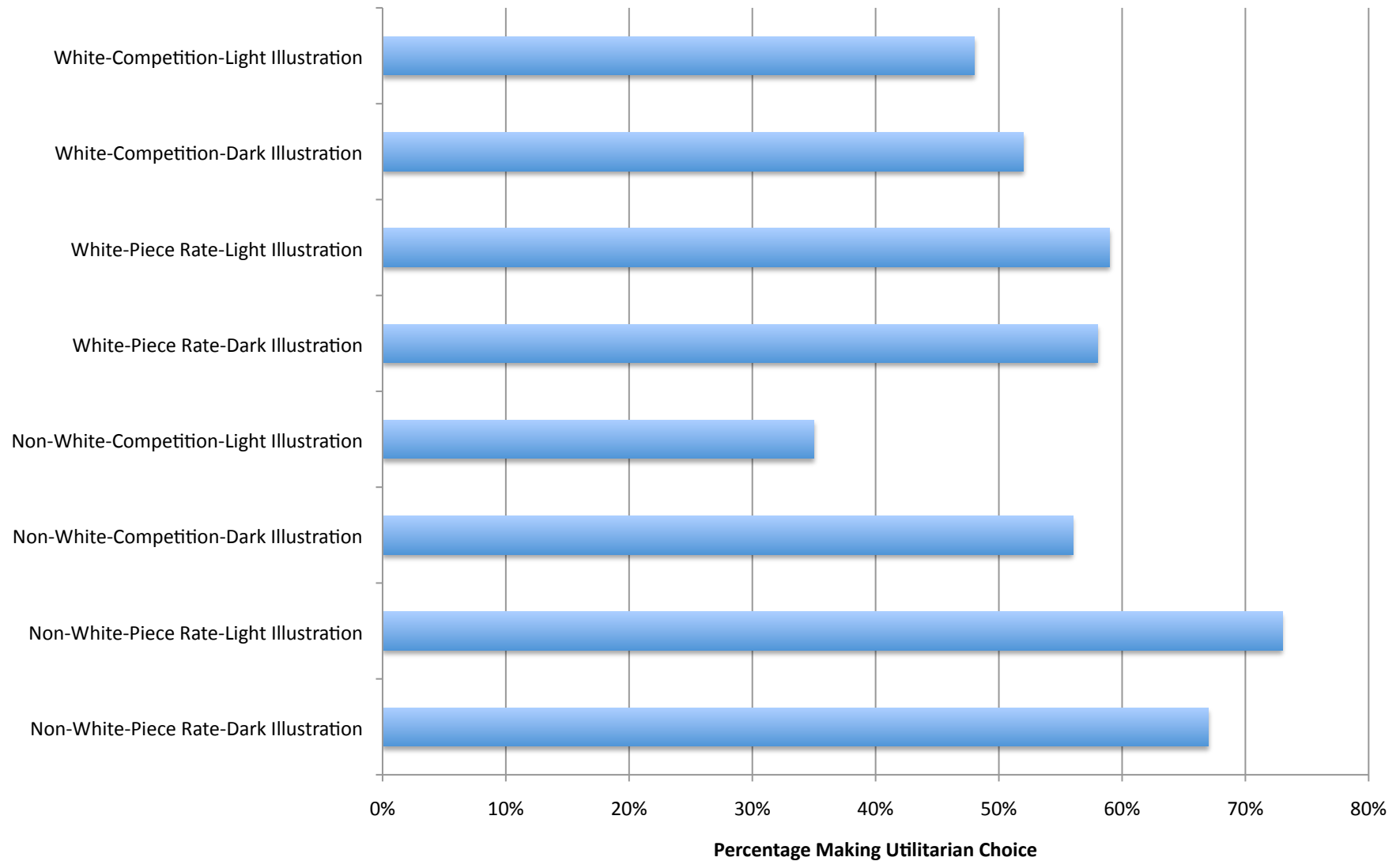
Figure 8: Experimental Design



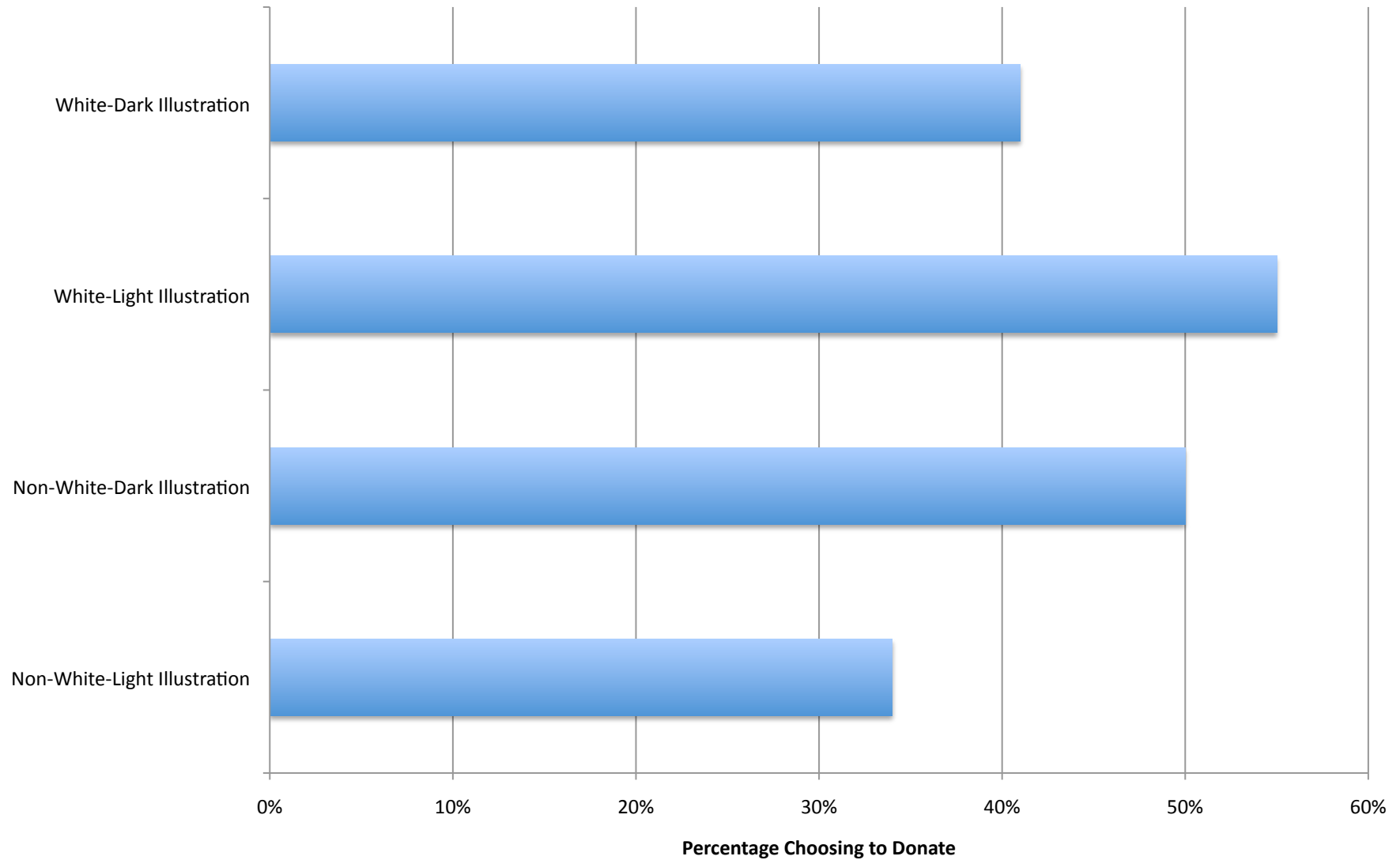
**Figure 9: The Effect of Competition on Deontological Commitments**



**Figure 10: The Effect of Competition on Other-Regarding Preferences**



**Figure 11: The Effect of Outgroup Priming on Charitable Donations**



**Figure 12: The Effect of Competition on Charitable Donations**

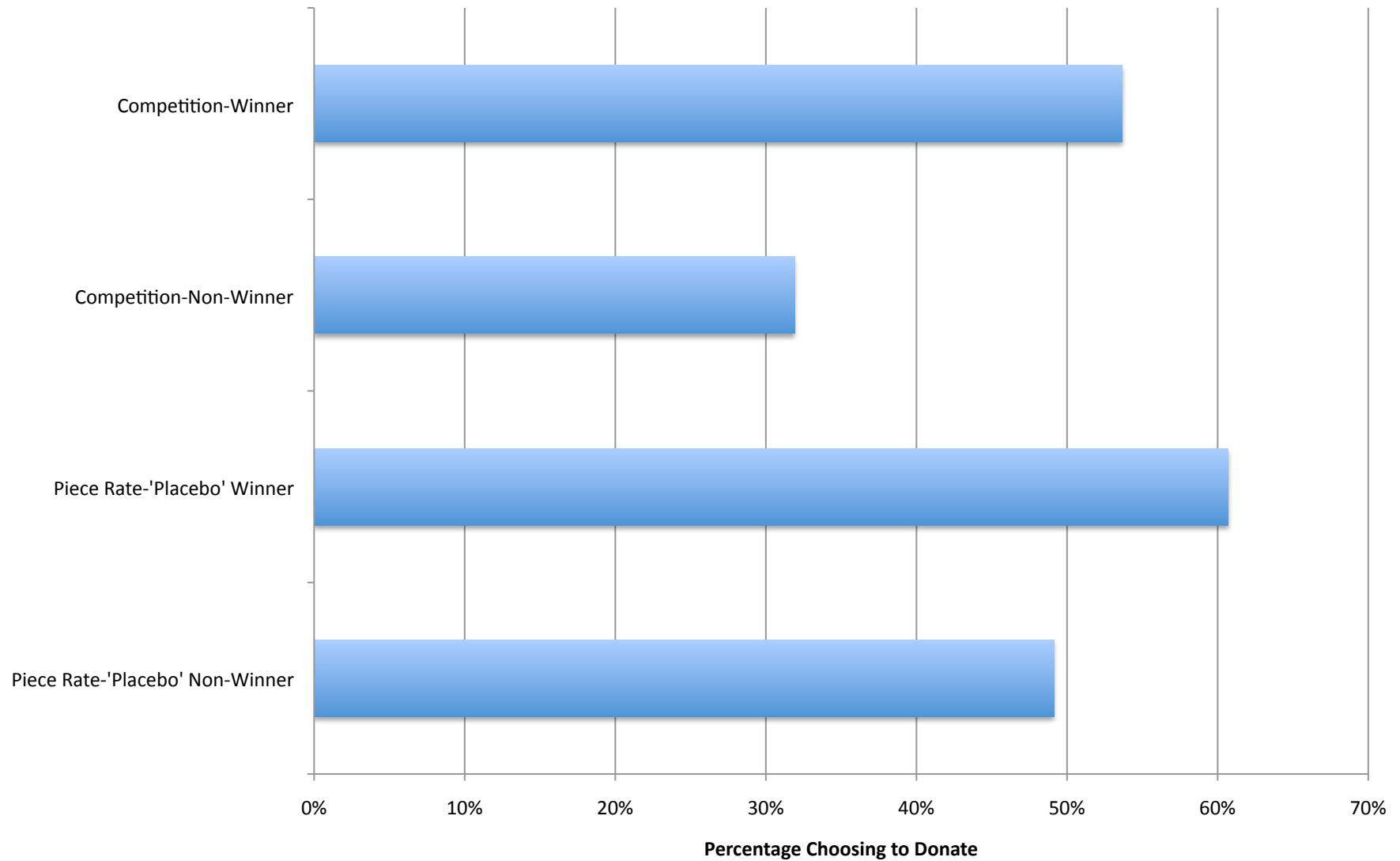




Table 1: Summary Statistics

Contract: Scenario: Illustration:	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 2: The Effect of Competition 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)
Competition		-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)
Competition * 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)
Male					0.114* (0.0681)	0.105 (0.0671)	0.178* (0.0918)	0.169* (0.0946)
Age					-0.00381 (0.00317)	-0.00355 (0.00312)	-0.00547 (0.00440)	-0.00483 (0.00448)
American					-0.151 (0.124)	-0.137 (0.122)	-0.229 (0.175)	-0.202 (0.179)
Indian					0.106 (0.200)	0.111 (0.197)	0.173 (0.267)	0.206 (0.276)
Christian					-0.108 (0.124)	-0.128 (0.122)	-0.188 (0.181)	-0.212 (0.186)
Hindu					-0.0968 (0.181)	-0.137 (0.179)	-0.203 (0.260)	-0.280 (0.267)
Muslim					-0.241 (0.204)	-0.270 (0.201)	-0.363 (0.237)	-0.413** (0.209)
Atheist					-0.120 (0.131)	-0.108 (0.129)	-0.223 (0.186)	-0.198 (0.192)
Religiousness					0.0299 (0.0300)	0.0393 (0.0298)	0.0380 (0.0441)	0.0507 (0.0453)
White					0.144 (0.101)	0.138 (0.0994)	0.200 (0.138)	0.188 (0.141)
Black					0.253 (0.156)	0.260* (0.154)	0.344*** (0.120)	0.355*** (0.126)
Hispanic					0.138 (0.146)	0.150 (0.144)	0.183 (0.169)	0.192 (0.171)
Log GDP PPP per capita					0.0195 (0.0815)	0.0117 (0.0802)	0.0408 (0.114)	0.0280 (0.118)
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. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Table 3: Other-Regarding Preferences -- The Effect of Competition on Utilitarianism Towards Outgroups

	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)
Competition		-0.454*** (0.148)		-0.504*** (0.152)		-0.678*** (0.150)
White *		0.382** (0.192)		0.464** (0.198)		0.555*** (0.146)
Competition						
Dark Illustration *		0.348* (0.188)		0.402** (0.190)		0.515*** (0.156)
Competition						
Dark Illustration *		-0.428* (0.255)		-0.502* (0.257)		-0.627*** (0.144)
Competition * White						
Male			0.119* (0.0697)	0.136** (0.0687)	0.167* (0.0903)	0.209** (0.0940)
Age			-0.00381 (0.00324)	-0.00510 (0.00322)	-0.00447 (0.00432)	-0.00734 (0.00452)
American			-0.0781 (0.124)	-0.146 (0.124)	-0.108 (0.171)	-0.227 (0.182)
Indian			-0.0333 (0.200)	0.0701 (0.199)	-0.0609 (0.265)	0.128 (0.277)
Christian			-0.114 (0.127)	-0.120 (0.124)	-0.186 (0.171)	-0.195 (0.184)
Hindu			-0.0196 (0.183)	-0.137 (0.183)	-0.0684 (0.247)	-0.236 (0.267)
Muslim			-0.232 (0.208)	-0.267 (0.205)	-0.330 (0.239)	-0.369 (0.244)
Atheist			-0.0897 (0.134)	-0.132 (0.132)	-0.167 (0.179)	-0.236 (0.189)
Religiousness			0.0356 (0.0309)	0.0302 (0.0302)	0.0471 (0.0425)	0.0400 (0.0445)
Log GDP PPP per capita			-0.0237 (0.0820)	0.0225 (0.0823)	-0.0369 (0.109)	0.0494 (0.118)
Observations	180	180	180	180	180	180
R-squared	0.278	0.326	0.336	0.385		

Notes: Standard errors in parentheses. \* p &lt; 0.10, \*\* p &lt; 0.05, \*\*\* p &lt; 0.01

Table 4: Validation -- The Effect of Outgroup Priming on Charitable Donations

	Ordinary Least Squares			Probit	
	(1)	(2)	(3)	(4)	(5)
	Donate	Donate	Donate	Donate	Donate
White	0.0387		0.209*	-0.0261	-0.0527
	(0.0748)		(0.114)	(0.140)	(0.160)
Dark Illustration		-0.0129	0.156	0.157	0.189
		(0.0753)	(0.112)	(0.111)	(0.121)
White * Dark			-0.301**	-0.263*	-0.285**
Illustration			(0.151)	(0.149)	(0.142)
Footbridge				-0.0498	-0.0597
Scenario				(0.0749)	(0.0811)
Competition				-0.139*	-0.161**
				(0.0762)	(0.0819)
Male				0.0452	0.0501
				(0.0794)	(0.0863)
Age				0.00900**	0.00999**
				(0.00369)	(0.00401)
American				0.129	0.149
				(0.145)	(0.155)
Indian				-0.210	-0.248
				(0.230)	(0.239)
Christian				-0.0955	-0.0997
				(0.144)	(0.153)
Hindu				-0.370*	-0.380**
				(0.211)	(0.181)
Muslim				-0.171	-0.184
				(0.238)	(0.221)
Atheist				-0.0248	-0.0183
				(0.153)	(0.166)
Religiousness				0.0239	0.0268
				(0.0352)	(0.0381)
Log GDP PPP				-0.101	-0.115
per capita				(0.0949)	(0.110)
Observations	180	180	180	180	180
R-squared	0.001	0.000	0.024	0.150	

Notes: Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 5: The Effect of Competition on Charitable Donations

	Ordinary Least Squares		Probit
	(1) Donate	(2) Donate	(3) Donate
Competition	-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)
Male		0.0462 (0.0803)	0.0519 (0.0861)
Age		0.00891** (0.00374)	0.00985** (0.00402)
American		0.147 (0.146)	0.170 (0.154)
Indian		-0.256 (0.236)	-0.300 (0.234)
Christian		-0.108 (0.146)	-0.111 (0.151)
Hindu		-0.357* (0.214)	-0.364** (0.184)
Muslim		-0.185 (0.241)	-0.197 (0.217)
Atheist		-0.0261 (0.154)	-0.0171 (0.166)
Religiousness		0.0327 (0.0354)	0.0370 (0.0376)
White		-0.209* (0.119)	-0.264** (0.134)
Black		-0.0857 (0.184)	-0.109 (0.205)
Hispanic		-0.111 (0.172)	-0.149 (0.192)
Log GDP PPP per capita		-0.103 (0.0961)	-0.118 (0.110)
Observations	180	180	180
R-squared	0.010	0.137	

Notes: Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 6: 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)
Male		-0.0480 (0.121)	-0.0413 (0.122)		0.0936 (0.0932)	0.159 (0.147)
Age		0.00896 (0.00561)	0.00979* (0.00565)		-0.00332 (0.00433)	-0.00503 (0.00706)
American		0.123 (0.199)	0.145 (0.204)		-0.120 (0.154)	-0.184 (0.255)
Indian		0.341 (0.369)	0.378 (0.350)		-0.0163 (0.285)	-0.104 (0.543)
Christian		-0.0758 (0.218)	-0.0794 (0.213)		0.00174 (0.168)	0.0470 (0.316)
Hindu		-0.321 (0.273)	-0.318 (0.208)		-0.0741 (0.211)	-0.0824 (0.368)
Muslim		-0.348 (0.346)	-0.309* (0.187)		-0.293 (0.267)	-0.383 (0.257)
Atheist		0.162 (0.240)	0.196 (0.244)		-0.0750 (0.185)	-0.0604 (0.322)
Religiousness		0.0509 (0.0600)	0.0607 (0.0612)		0.0180 (0.0463)	0.0341 (0.0858)
White		-0.366 (0.226)	-0.399* (0.217)		0.0284 (0.174)	0.0197 (0.310)
Black		-0.108 (0.297)	-0.115 (0.298)		0.00605 (0.229)	0.00414 (0.397)
Hispanic		-0.134 (0.338)	-0.159 (0.306)		0.0733 (0.261)	0.170 (0.483)
Log GDP PPP per capita		0.100 (0.165)	0.111 (0.168)		0.0264 (0.127)	0.0210 (0.242)
Observations	90	90	90	90	90	90
R-squared	0.047	0.159		0.476	0.515	

Notes: Standard errors in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Table 7: 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)
Male		0.0548 (0.123)	0.143 (0.372)		0.123 (0.113)	0.677 (0.426)
Age		0.0103* (0.00570)	0.0325* (0.0173)		-0.00289 (0.00527)	-0.0109 (0.0170)
American		0.00687 (0.259)	0.149 (0.753)		-0.198 (0.239)	-1.044 (0.960)
Indian		-0.857* (0.500)	-7.887 (.)		0.767 (0.462)	7.683*** (1.260)
Christian		-0.197 (0.217)	-0.805 (0.737)		-0.337* (0.201)	-1.309* (0.693)
Hindu		-0.117 (0.550)	3.654** (1.623)		-0.837 (0.509)	-7.161 (.)
Muslim		0.0384 (0.443)	4.018** (1.907)		-0.606 (0.409)	-1.428 (1.577)
Atheist		-0.318 (0.217)	-1.117 (0.752)		-0.202 (0.200)	-0.942 (0.676)
Religiousness		-0.00970 (0.0490)	-0.00830 (0.149)		0.0456 (0.0453)	0.0655 (0.172)
White		-0.273* (0.161)	-1.369* (0.707)		0.166 (0.149)	0.397 (0.518)
Black		-0.143 (0.252)	-0.657 (0.930)		0.461* (0.233)	
Hispanic		-0.146 (0.208)	-0.790 (1.001)		0.152 (0.193)	0.542 (0.635)
Log GDP PPP per capita		-0.106 (0.145)	-0.606 (0.668)		0.0329 (0.134)	0.613 (0.642)
Observations	90	90	90	90	90	85
R-squared	0.011	0.279		0.155	0.337	

Notes: Standard errors in parentheses. The Black coefficient drops out in Column 6 because all Blacks made the Utilitarian choice in the non-Tournament condition. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 8: The Effect of Competition on Productivity

	(1)	(2)	(3)	(4)
		Log Error Post-Treatment		Falsification: Pre-Treatment Log Error
Competition	-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)
Male		-0.326* (0.185)	-0.266 (0.172)	-0.163 (0.188)
Age		-0.0138 (0.00856)	-0.0114 (0.00798)	-0.00667 (0.00871)
American		-0.455 (0.340)	-0.346 (0.317)	-0.297 (0.346)
Indian		1.047* (0.552)	0.758 (0.517)	0.789 (0.562)
Christian		0.410 (0.335)	0.341 (0.312)	0.186 (0.341)
Hindu		0.945* (0.484)	0.618 (0.455)	0.890* (0.493)
Muslim		1.230** (0.548)	1.120** (0.510)	0.302 (0.558)
Atheist		0.631* (0.358)	0.515 (0.334)	0.318 (0.365)
Religiousness		0.0459 (0.0813)	-0.0256 (0.0770)	0.195** (0.0828)
White		0.549** (0.272)	0.347 (0.256)	0.550** (0.277)
Black		0.799* (0.417)	0.738* (0.388)	0.168 (0.424)
Hispanic		0.809** (0.390)	0.756** (0.363)	0.143 (0.397)
Log GDP PPP per capita		0.357 (0.225)	0.330 (0.209)	0.0747 (0.229)
Log Error Pre-Treatment			0.367*** (0.0729)	
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. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



Table 9: The Effect of Competition on Utilitarian Values over Economic Development

	Ordinary Least Squares			Probit		Ordinary Least Squares			Probit	
	(1) Utilitarian	(2) Utilitarian	(3) Utilitarian	(4) Utilitarian	(5) Utilitarian	(6) Donate	(7) Donate	(8) Donate	(9) Donate	(10) Donate
Footbridge	-0.525***	-0.544***	-0.554***	-0.572***	-0.615***			-0.0646		-0.0740
Scenario	(0.0625)	(0.0613)	(0.0639)	(0.0633)	(0.0658)			(0.0760)		(0.0809)
Competition	-0.174***	-1.137**	-1.023**	-0.929***	-0.900***	-0.100	0.455	0.121	0.432	0.0997
	(0.0625)	(0.452)	(0.491)	(0.123)	(0.182)	(0.0743)	(0.546)	(0.584)	(0.475)	(0.630)
Ln GDP PPP		-0.106***	-0.0270	-0.136***	-0.0171		0.0889**	-0.0890	0.0899**	-0.102
per capita		(0.0324)	(0.0851)	(0.0449)	(0.120)		(0.0390)	(0.101)	(0.0400)	(0.115)
Competition * Ln		0.102**	0.0903*	0.128**	0.113		-0.0594	-0.0275	-0.0596	-0.0273
GDP PPP per capita		(0.0469)	(0.0506)	(0.0644)	(0.0721)		(0.0567)	(0.0602)	(0.0580)	(0.0651)
Dark Illustration			0.0917		0.120			0.00895		0.0110
			(0.0665)		(0.0942)			(0.0791)		(0.0846)
Male			0.108		0.171*			0.0480		0.0535
			(0.0678)		(0.0929)			(0.0806)		(0.0861)
Age			-0.00393		-0.00548			0.00895**		0.00991**
			(0.00315)		(0.00437)			(0.00375)		(0.00403)
American			-0.133		-0.200			0.142		0.165
			(0.124)		(0.177)			(0.147)		(0.155)
Indian			0.167		0.246			-0.274		-0.313
			(0.202)		(0.260)			(0.240)		(0.233)
Christian			-0.119		-0.215			-0.105		-0.109
			(0.123)		(0.181)			(0.147)		(0.151)
Hindu			-0.186		-0.323			-0.330		-0.341*
			(0.187)		(0.260)			(0.222)		(0.196)
Muslim			-0.293		-0.425**			-0.169		-0.184
			(0.205)		(0.211)			(0.244)		(0.225)
Atheist			-0.123		-0.245			-0.0252		-0.0164
			(0.130)		(0.186)			(0.155)		(0.166)
Religiousness			0.0273		0.0344			0.0335		0.0382
			(0.0299)		(0.0444)			(0.0355)		(0.0378)
White			0.117		0.163			-0.200*		-0.257*
			(0.102)		(0.142)			(0.121)		(0.136)
Black			0.224		0.314**			-0.0769		-0.101
			(0.156)		(0.143)			(0.185)		(0.207)
Hispanic			0.120		0.164			-0.106		-0.141
			(0.145)		(0.179)			(0.173)		(0.194)
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. Income data from World Economic Outlook Database (IMF 2009). \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01