MARKETS, MORALITY, AND ECONOMIC GROWTH: COMPETITION AFFECTS UTILITARIAN JUDGMENT

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Abstract   Scholars since Hume and Smith have debated possible causal connections between market experiences and moral beliefs. Of particular interest today are questions related to incentive designs: for example, could the structure of employment affect moral attitudes? Here, I study the impact of employment structure on three normative issues: utilitarian versus deontological values, other-regarding preferences, and charitable donations. Through a labor market intermediary, I randomly assigned workers to competitive or piece-rate work conditions. The groups were given a moral question posing a conflict between utilitarian and deontological values, and offered a choice to make a charitable donation. The moral question was accompanied by an illustration that made salient outgroup considerations. Four results emerge: Competitively structured work experiences increased deontological value choices, deontological commitments towards outgroup members, and donations by productive workers relative to non-productive workers; and the effects on deontological value choices differ over economic development. I reconcile these results with a formal model based on experimental findings in affective moral psychology. When competition is perceived as unfair or unfamiliar, negative affect triggers deontological value choices, but when it is perceived as familiar or even fun, positive affect increases utilitarian attitudes. If utilitarian attitudes lead to market-oriented policies, multiple steady states arise where some countries sustain high utilitarianism, market-orientation, and economic growth, and vice versa. This perspective helps explain the intellectual history of the *doux commerce* thesis.

Keywords: Normative commitments, deontological value choices, other-regarding preferences, charitable donations, moral trolley problem

JEL codes: B51, C93, D63, D64, J15, K00

"The employment of the great body of the people comes to be confined to a few operations ... and generally becomes as stupid and ignorant as it is possible for a human creature to become... [He is incapable] of forming any just judgment concerning many even of the ordinary duties of private life. Of the great and extensive interests of his country, he is altogether incapable of judging." (Smith 1776, pp. 781-782)

1   Introduction

At least since Adam Smith and David Hume, scholars have offered hypotheses about the effect of a citizen's economic experience on his or her moral life as an individual. It has been asserted that competition may bring a winner-take-all mentality and a lack of concern for others or that exposure to market values will lead us to abandon non-utilitarian forms of moral thought, treating every moral issue instead in terms of costs and benefits. (Whether this is viewed as a bad thing, of course, depends on one's attitude towards utilitarianism.) On the positive side, the proponents of the so-called *doux commerce* thesis have proposed that a competitive market, with its disruptive effect on geographical and tribal isolation, will actually have morally improving effects, increasing our care for and understanding of others.

Despite the wealth of hypotheses, empirical or experimental data in a labor market setting has been largely absent. In this study, I focus on a particular question from these larger debates: does the structure of employment affect moral attitudes and behavior? Even when something is already on the market, a debate persists regarding how much market competition to introduce. This debate plays out in the proper degree of pay-for-performance incentives for teachers and doctors (Lemieux et al. 2009) and in characterizations of the modern economy as a winner-take-all society (Frank and Cook 2010). The U.S. Supreme Court has stated that "[t]he heart of our national economic policy long has been faith in the value of competition" (*Standard Oil v. FTC*, 340 U.S. 231, 248 (1951)). Two oft-stated concerns, however, are whether market competition makes people immoral (Shleifer 2004) and whether people become corrupted or degraded if turned into commodities (Radin 1987). Several dimensions of the contemporary, free market experience, such as up-or-out promotion schemes and highly incentivized bonus systems (e.g., tournaments) can be distinguished from the commodification dimension (e.g., piece rate) of the market experience.

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 2000; Eriksson and Villeval 2008). People with particular pre-existing traits may also select into competitive environments. Such self-selection makes it difficult to ascertain causality when competitive conditions correlate with immoral behavior (Fletcher and Nusbaum 2008; Ford and Richardson 1994; Detert et

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al. 2008; Dubinsky and Ingram 1984).

Using a labor market intermediary, I randomly assigned workers to competitive or piece-rate conditions for a data-entry task. Workers in the competitive group were paid differently based on their competitive rank in the group whereas those in the piece-rate group were simply paid based on work completed. (I use "tournament" and "competition" interchangeably to economize on terminology. The treatment is related to those used in other tournament experiments (e.g., Niederle and Vesterlund 2007; Freeman and Gelber 2010).) After completing the task, the groups were given a moral question, a form of the classic "Trolley Problem", that posed a conflict between utilitarian and deontological values. A control experiment asks workers to do one data-entry task and then immediately answer the moral trolley dilemma. Finally, workers were given a choice about whether or not to donate a portion of their wages to a charitable organization.

To assess utilitarian and deontological value choices, philosophers and psychologists have relied on the "Trolley Problem" (Foot 1967). In its most basic form, the moral trolley problem asks individuals whether they would kill one person in order to save five. 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 some policy decisions. The trolley problem has many versions that measure various dimensions of moral decision-making (Thomson 1985). This study uses the standard modification (*bystander* vs. *footbridge* scenario) to measure utilitarian versus deontological values and a new modification to measure other-regarding preferences. The experimental literature generally labels the non-utilitarian choice in the moral trolley problem as deontological, so I use deontological and non-utilitarian interchangeably.

In the *bystander* scenario, individuals are asked if they would divert a trolley to save five but kill one. Subjects who say they are willing to do so are considered *utilitarian*. In the *footbridge* scenario, individuals are asked if they would push someone in front of the trolley and kill him but save five. Subjects who say they are not willing to do so are considered *deontological*. A deontological perspective takes into consideration the Kantian categorical imperative to avoid wrongdoing, even when it appears to produce good consequences. The footbridge scenario emphasizes the deontological aspect of moral values because it emphasizes the act involved in pushing an individual to his death versus the duty not to do so (Greene et al. 2001). The bystander scenario is logically equivalent to the footbridge scenario, but does not require consideration of an emotion-evoking personal violation to reach a utilitarian outcome (Greene et al. 2001).

Using both variants is helpful for two reasons. First, it provides an opportunity to compare with canonical responses so as to validate the experimental design. More than 200,000 indi-

viduals have taken the moral trolley problem (Mikhail 2007; Miller 2008) and the universal patterns of response suggest that the moral trolley problem is an interpretable measure of normative commitments (see, e.g., Doris 2002; Kahneman and Tversky 1984; Kelman et al. 1996; Schall et al. 2008; Sunstein 2005; Unger 1996; Valdesolo and DeSteno 2006; Wheatley and Haidt 2005; I use "commitment", "value choices", "attitudes", and "motivations" interchangeably). It can be compared to the Implicit Association Test, a non-incentivized measurement of unconscious stereotypes that has been used by economists to measure attitudes (Beaman et al. 2009). Second, it provides an appropriate control condition; given the lack of a negative emotional response in the bystander scenario, a heightened emotional affect should not influence responses to it (Valdesolo and DeSteno 2006).

The modification I introduce to the moral trolley problem varies the race of the individuals being saved or sacrificed in an illustration of the moral trolley problem. Researchers have presented the moral trolley scenario with names that are stereotypically White American or Black American (Uhlmann et al. 2009), but have not varied the skintone as far as I am unaware. 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. There is also a decision-maker who has a question-mark for its face. In this study, the term "other-regarding" refers to people of a different skin tone. Studies have found that people become more willing to sacrifice in the moral trolley problem when non-group members such as non-human primates are presented as the objects of sacrifice (Petrinovich et al. 1993; Petrinovich and O'Neill 1996). I use the moral trolley illustration with different races to investigate where people draw the line between ingroups and outgroups and whether competition makes them more utilitarian regarding outgroup members. Demographic information on the workers allows me to compare attitudes to saving or sacrificing people of the same or different race.

Four results emerge. Competitively structured work experiences increased (a) deontological value choices, (b) deontological commitments towards outgroup members, and (c) donations by productive workers relative to non-productive workers. However, (d) the effects on deontological value choices differ over economic development. In rich countries, competition makes individuals more utilitarian. To explain these findings, I build a simple model related to experimental findings in affective moral psychology. The classical political economists who did speculate on the effects of markets seemed to suggest that market experiences would have an emotional effect on an individual, whether through triggering a winner-take-all mentality and a lack of concern for others or through disrupting isolation between groups. Recent economists also argue that competition activates the emotions (Hirschman 1982) and this is

the line of argument I take to explain the findings.

The argument builds on the observation that competition is less in early societies (Leibbrandt et al. 2013) and, in non-capitalist cultural mentalities, a "fair" price is more important to a community than a "free" market price (Scott 1977). Thus, market competition may be perceived to be unfair or unfamiliar early in the course of economic development, triggering negative emotions. Negative emotions cause individuals to become more deontological (Wheatley and Haidt 2005; Schall et al. 2008; Valdesolo and DeSteno 2006). This is consistent with globalization and market integration potentially making people more moral (Henrich et al. 2001).[1] As markets develop, competition becomes perceived as fair or even fun, triggering positive emotions and utilitarian commitments. This is consistent with the changing views on the fairness of meritocracy (Zingales 2014); in dictator games, Berkeley students reward hard work while Kenyans did not (Jakiela 2015). If competition increases productive capacity (competition reduces by one-third the error rates, which is the metric by which workers are compared to other workers in the tournament; and other papers also report that competition increases income, e.g., Gneezy et al. 2009) and utilitarianism leads to competitive market arrangements, then a positive feedback arises between competition, productive efficiency, and utilitarian commitments.

More specifically, at an early stage of economic development, moral values and economic conditions are at a stable steady state–in a poor country, a competition shock would stimulate workers to become more deontological and prefer less competitive structures, which undermines the initial competition shock–this renders 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 competition is perceived as fair, the effect of competition reverses, and a positive feedback arises. Hence, competition increases deontological commitments but the effect reverses with income.

The results are consistent with the view that moral preferences, such as deontological and utilitarian commitments, may be endogenous to economic growth. More generally, they provide new evidence on the effect of labor market experience on utilitarian value choices. They also provide empirical support for theoretical models of market-oriented policies and growth being endogenous to attitudes and beliefs about market-orientation (e.g., Buera et al. 2011).

The remainder of the paper proceeds as follows. Section 2 presents the background literature and theoretical framework. Section 3 describes the experimental design. Section 4

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[1]The globalization comparison may be apt in another way as the subjects did not know who they were competing with in the labor market intermediary and the labor market intermediary itself has contributed to a globalized labor market. This aspect of the research setting differs from other experiments on employment structure (Bandiera et al. 2005; Bandiera et al. 2007; Bandiera et al. 2009; Bloom et al. 2013).

discusses the results. Section 5 articulates limitations. Section 6 concludes.

2 Theoretical Framework

2.1 Background Going back to Smith, Mill, and Montesquieu, a line of scholars theorized that market forces increase morality. Wherever there is commerce, manners are gentle (Montesquieu 1749). Commerce operates to cordialize mankind (Paine 1792). The economical advantages of commerce are surpassed in importance by those of its effects, which are intellectual and moral (Mill 1848). Smith and Hume, too, wrote of virtues being enhanced by commerce (Rosenberg 1964).

But the intellectual history of the *doux commerce* thesis seems to stop around 1850, the starting point of a centuries-long trend in which scholars perceived markets to decrease morality. Capitalist society undermines its own moral foundations through alienation and exploitation in the capitalist production process (Marx 1867). The competitive instinct has a profoundly degrading effect on individual judgment and conduct (Veblen 1899). Capitalism creates a critical frame of mind, which destroys moral authority (Schumpeter 1942).

Classical political economists focused on the ways that certain exchanges can influence the people we become. Markets change individuals' economic mentalities to behave more as neoclassical economic theory would predict, which (according to Polyani) perpetuated the myth that humanity's innate propensity is to barter and trade rather than reciprocate and redistribute (Polanyi 1944). Markets make fewer demands on people's elevated motivations (Hayek 1948). Simmel (1955) wrote about the alienating properties of money, but also noted that competition fosters empathy, not among the competitors, but between them and third parties (Hirschman 1982).

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

Regarding labor markets, Smith (1776) suggests that what a person can do and be, what he wants and what he can hope for, are influenced by the structure and character of the market. He suggested that if our preferences are endogenous to markets, then it is circular to appeal to a market's ability to satisfy those preferences as its central justification. Market outcomes cannot be ranked unambiguously by preference rankings if the preference rankings themselves

depend on markets. More specifically, Smith's assessment of labor markets suggests that markets would fail if it eroded workers' sense of justice and public spirit (Smith 1761, pp. 189-190; Satz et al. 2010).

This debate is alive today (see, e.g., Posner 1999; Radin 1987; Sandel 2010; Friedman 2010). Economists and non-economists alike hotly contest the proper scope of markets (Foundation 2008). Economists have tended to focus on the boundary between markets and government (Hart et al. 1997) instead of the boundary between markets and inalienability, such as in the areas of surrogacy, organ transplants, and worker's compensation. Economists have begun to approach the issue (and psychologists have already studied the issue of taboo trade-offs (Tetlock et al. 2000)): Roth (2007) delineates certain market transactions as repugnant and Mankiw and Weinzierl (2010) suggest that standard normative economic theory may need to be broadened to address why some normative arrangements (e.g., taxing height) that are economically optimal are perceived as repugnant. Non-economists worry about apathy in a society where a toddler was run over twice by a van because it cost less to pay a dead girl's parents than to pay for hospital expenses (Demick 2011) or where a helper, who prevented a suicide instead of passively watching, received a monetary award for displaying traditional virtues (Daily 2011).

Measuring moral values in a manner that transcends cultural context is challenging. This study measures three forms of moral values, two that are more standard to the economics literature–other-regarding preferences and charitable donations–and one that is not–utilitarian vs. deontological value choices. Utilitarian and deontological values broadly represent consequentialist and Kantian traditions, which offer competing theories for judging the morality of actions (whether through a utilitarian calculation of the good and bad consequences of one's choices or the application of deontological principles of moral duty). In contemporary policy, the divide between deontology and consequentialism is considered to be the greatest battle. Theorists argue over deontological and consequentialist theories for criminal policy, contract law, property rights, procedural justice, constitutional interpretation, and international law. Some economists have begun to model deontological value choices. "Homo Kantiensis", whose preferences are ones that are socially optimal when everyone else also holds that view, is evolutionarily stable when preferences rather than strategies are the unit of selection (Alger and Weibull 2012). Other papers have modeled the conditions under which Kantian behavior emerges (Falk and Tirole 2016). While deontological value choices are not universally considered the more moral behavior, it is conventionally considered as such. The philosophy literature tends to connote deontological commitments with ethical behavior (Bartels 2008; Nichols and Mallon 2006). Everett et al. (2016) found that participants who make deontological judgments are perceived as more moral and trustworthy and

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preferred as social partners. There is no necessary connection between deontological commitments and charitable donations in theory. In my data, the deontological choice is not correlated with the charitable decision.

Technically, the "Trolley Problem" measures "act utilitarianism" rather than "rule utilitarianism" since the individual decision to act deontological in this context can still be utilitarian in a broader sense. Similarly, individuals can have a deontological adherence to a utilitarian rule. Though there are non-deontological interpretations of the footbridge scenario, these have been rejected by a number of moral philosophers (Thomson 1985; Gorr 1990). Specifically, the thought of harming someone in a "personal" way, as in the footbridge dilemma, triggers a negative emotional response that effectively says, "That's wrong, don't do it!" This emotional alarm bell overrides any consequentialist inclination to approve the five-for-one tradeoff and has been proposed as an explanation for why activating emotional processing can alter moral judgment (Greene et al. 2004; Greene et al. 2008). The universal patterns of response suggest that the moral trolley problem is an interpretable measure of normative commitments. Untutored adults and even young children are capable of drawing intelligent distinctions between superficially similar moral trolley scenarios (see, e.g., Alter et al. 2007; Cushman et al. 2006; Haidt 2001; Robinson et al. 2007; Solum 2006; Miller 2008; Young and Saxe 2008).

The importance of fairness norms in markets is highlighted by Kahneman et al. (1986) and supported by physiological studies. Sanfey et al. (2003) found that unfair offers elicited activity in brain areas related to emotion and cognition. Wout et al. (2006) found that skin conductance activity was higher for unfair offers and the pattern was only observed for offers proposed by humans but not for offers generated by computers. Manipulation of the affective (emotional) state, and in particular, oxytocin, of an individual alters moral judgment (Wheatley and Haidt 2005; Schall et al. 2008; Valdesolo and DeSteno 2006; Churchland 2011). The affective state may be manipulated through the market experience, in and of itself, in which the stimulus increases temporarily the accessibility of knowledge units in the memory of an individual, which makes it more likely that these knowledge units are used in the reception, interpretation and judgment for subsequent external information. Such a channel is called priming (Bargh and Chartrand 2000; Storms 1958; Higgins and Chaires 1980), which has been employed by Benjamin et al. (2010) in economic studies. There is also a large literature on the role of emotions in decision-making (Loewenstein and Lerner 2003). Recent studies provide field evidence of the effect of mood or arousal in decision-making, e.g., soccer outcomes and stock returns (Edmans et al. 2007), cloudy weather and stock prices (Saunders Jr. 1993), and weather and the college decision (Simonsohn 2010).

Many experiments document how the part of the brain responsible for processing emotions

is active when individuals are faced with moral dilemmas, and it is believed that emotions play an integral role in deontological decision-making (Cushman et al. 2010). When the part of the brain responsible for processing emotions is unavailable, individuals are more likely to make utilitarian decisions (Koenigs et al. 2007). Deontological judgments may be related to emotions because the moral calculus involves the weighing of contexts. In particular, affective moral psychology finds that negative emotions cause deontological responses to moral judgments (Wheatley and Haidt 2005; Schall et al. 2008), while positive emotions generate utilitarian responses (Valdesolo and DeSteno 2006).

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

Laboratory experiments and theoretical studies suggest that individuals make different moral decisions in regards to ingroup and outgroup members. They are more charitable towards ingroup members (Tajfel et al. 1971; Hoffman 2001; Chen and Li 2009) and market interactions affect the treatment of outgroup members (Kennedy and Stephan 1977; Bowles 1998; Echebarria-Echabe and Fernandez Guede 2003).

Several other economic studies investigate the effect of individual experience on ideology. These studies have not looked at the experience of competition per se. Beaman et al. (2009) found that exposure to female leaders affects attitudes towards women. Di Tella et al. (2007) found that allocation of land titles affects beliefs. Cantoni et al. (2014) found that curriculum

change affects ideology. Fisman et al. (2009) found that ideology of an instructor affects students' ideology. All these studies measure moral values in different ways.

2.2   Model   Define u_t as the share of utilitarian people in society at time t; γ_t is the level of unfamiliarity with competition (i.e., the higher is γ_t, the greater the antagonism to a competitive shock); w_t is the level of negative affect.

The first equation governing the process will be:

$$(1)\quad \gamma_t = \alpha - \beta u_t$$

This equation means that a high level of utilitarian attitudes is associated with market-oriented policies, as competition increases productive efficiency. Conversely, a high level of deontological attitudes is associated with decreased choice of competitive market arrangements. The less market-orientation, the less familiarity with competition.

The second equation of the process will be:

$$(2)\quad w_t = \alpha_\gamma - \beta_\gamma \gamma + \alpha_u - \beta_u u + \beta_{\gamma u} \gamma u.$$

The equation is derived from the interplay between competition and emotional response. Competition increases positive affect when it is perceived as familiar or even fun and decreases positive affect when it is perceived as unfamiliar or unfair. To see this, as γ goes to 0, the relationship between w_t and u is negative, which reflects the lack of negative affective response to increased market-orientation. Conversely, γ becomes very positive, the relationship between w_t and u becomes positive. Increased market-orientation triggers negative affect.

Finally, I close the model with the insight from affective moral psychology. Negative emotions cause deontological responses to moral judgments (Wheatley and Haidt 2005; Schall et al. 2008), while positive emotions generate utilitarian responses (Valdesolo and DeSteno 2006). I model this by assuming that negative emotions increase deontological value choices and decreases utilitarian ones (the parameters represented by greek letters $\gamma, \alpha, \beta, \phi, \delta$ are all positive while the parameters represented by alphabetical letters a_1, a_2, a_3 are derived from the fundamental parameters):

$$(3)\quad n_t = \frac{1}{\phi w_t} = \frac{1}{a_1 + a_2 u_t - a_3 u_t^2},$$

The evolution of u_t is as follows: at each subsequent period, the stock of utilitarian individuals decays by a constant fraction δ. However, it gets supplemented as described in equation (3). Then, the dynamics of utilitarian value choices will follow as:

$$(4)\quad u_{t+1} = u_t(1-\delta) + n_t.$$

Therefore, the steady state would satisfy:

$$(5) \quad u = u(1 - \delta) + \frac{1}{a_1 + a_2 u - a_3 u^2}.$$

Or,

$$(6) \quad \delta a_3 u^3 - \delta a_2 u^2 - \delta a_1 u + 1 = 0.$$

This equation has three roots. If all are real, $u(1 - \delta) + \frac{1}{a_1 + a_2 u - a_3 u^2}$ will intersect the $45°$ line at three places. Even though all three points represent steady states, they can be characterized as follows: Since a_3 is positive as is the constant term 1 of the cubic equation, at most two of the roots are positive. Second, $a_3 > 0$ implies that the two endpoints are unstable while the middle root is stable. In this case, the two stable equilibria are the middle root and $u = 1$, where the third world and first world, respectively, are located in Figure 1. In cases where the equation has one real and two complex roots, the unstable steady state is the only interior steady state. In this case, the two stable equilibria are $u = 0$ and $u = 1$.

FIGURE 1.— Multiple Steady States
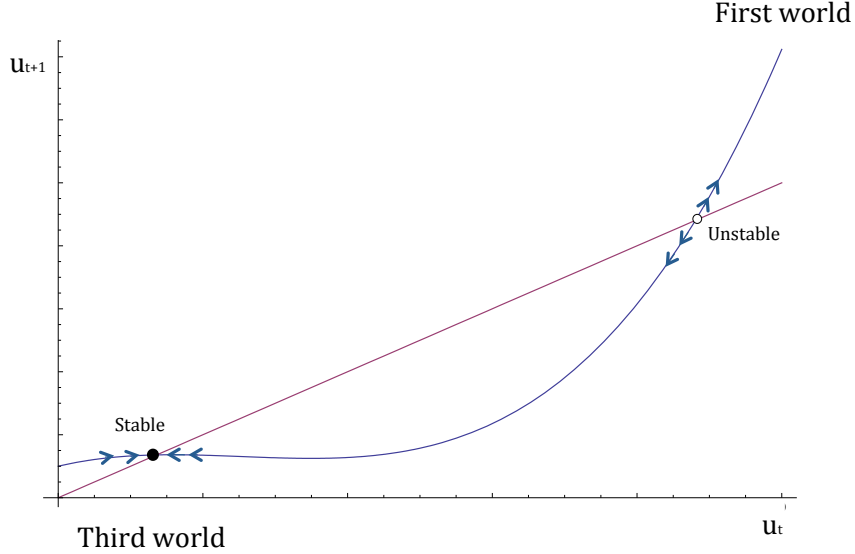
3   Design of Experiment

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

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multiple worker IDs by using e-mail addresses, IP addresses, and, in some cases, bank accounts. These measures prevent workers from entering the experiment more than once. Hundreds of thousands of jobs are posted each day (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 et al. 2009) and may be comparable to subjects in a real labor market (Barankay 2010). This study employs an experiment in an online labor market that shares some similarities with a natural field experiment as well as a traditional laboratory experiment. This allows me to present moral trolley problems with different races without subjects seeing the race of the experimenter (Cilliers et al. 2015) or inferring that other subjects see different races in their trolley problem. As noted below, subjects respond with utilitarian or deontological choices to the different versions of 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 typical buyer is a firm who prefers to outsource this kind of work. The buyer 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[2], 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

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[2]In a separate survey, recruiting workers with the same job advertisement as the one described in this experiment, workers reported the following day jobs. In the United States, workers reported: Administrative Assistant, Architect, Budget Analyst, Child care, Day Trader, Editor, Engineer, Student (Law), Government employee, Medical claims processor, Manager, Musician, Navy, Photographer, Respiratory Therapist, Surveyor, Unemployed, Video editor, Web Designer, Carpenter, Call-Center, Nurse, Secretary, Server, or Writer. In India, workers reported: Accountant, Stenography, Medical transcriptions, Business Process Outsourcing, Consultant, Child care/Home maker, Content Writer, Unemployed, Customer Services, Office Worker, Desktop Publisher, Electrician, Freelancer, Data Entry, Student (High School, MBA), Call-Center, Information Technology, Barber, Computer Science Lecturer, Fuel Stations, Software Programmer, Research Analyst, Singer, Stock Broker, Teacher, Textile Designer, Logistics, Farming, Chiropractor, Mechanic, Restaurant. Drawing on a broader set of subjects reduces the reliance on Western, Educated, Industrialized, Rich and Democratic students, though, of course, the subjects are computer-literate.

not inherent to the LMI. Most buyers post tasks directly on the LMI website, but they are also able to host tasks on an external site. I use this external hosting method; I post a single placeholder task (Appendix Figure A.1) containing a description of the work at the LMI and a link for 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 2 as guide). Treatment is not revealed at this early state. All workers see identical instructions (Appendix Figures A.2 and A.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 at the time of arrival, 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; Titchener 1967). I ask workers to transcribe paragraphs from a Tagalog translation of Adam Smith's The Wealth of Nations. An example is shown in Appendix Figure A.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.[3] 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 may not be aware 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 et al. 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 in Section 5 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 (Appendix Figure A.3) in order to minimize differential attrition before the treatment is revealed (Appendix Figures A.4a and A.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

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[3]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 et al. (2010).

(Figure 2). 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. All screenshots are displayed in the Appendix. Appendix Figures A.1 and A.2 show the employer job posting. 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. A paragraph takes about 100 seconds to enter so the offered payment of 10 cents per paragraph is equivalent to $86.40 per day. The current federal minimum wage in the Unites States is $58/day. In India, it depends on the type of work done, although the "floor" for data entry positions appears to be about $6.38/day.[4] An example paragraph is displayed on the first page of the external hosting site so workers are aware of the high payment before entering the study. Amir et al. (2012) reports that the payments provided in Amazon Mechanical Turk are effectively equivalent to payments in undergraduate laboratories.

Halfway through their task, i.e. after a lock-in task of 3 paragraphs at 10 cents per paragraph (Appendix Figure A.3), workers are informed of their payment scheme. This lock-in successfully reduces attrition. Attrition is defined as having over 500 errors out of a maximum of 507 characters for any paragraph. Of 274 subjects who agreed to start work, 201 completed the lock-in task of 3 paragraphs; of the 201 who saw the first treatment revelation, 180 continued working and answered the survey questions. The 21 attriters are evenly distributed across treatment interactions (there are 3 treatment groups so there are 8 treatment interactions) as shown in the lower half of Table 1. Pre-Treatment attrition in Table 1 is attrition that occurs before workers see whether 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, it is possible that attrition would have been one-third (180 out of 274) instead of one-tenth (180 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 2014).

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 (Appendix Figure A.4a) or are placed in a tournament condition (Appendix Figure A.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 re-

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[4]Payscale, Salary Snapshot for Data Entry Operator Jobs, http://www.payscale.com/research/IN/Job=Data-_Entry_Operator/Salary?, accessed June 17, 2011.

ceives 30 cents for each paragraph and the rest receive nothing. Thus the expected value of the task to the worker stays the same (30 cents for 3 paragraphs). To be sure, 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, but the competitiveness factor is raised. The tournament scheme follows Gneezy and Rustichini (2000) 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. In my second stratification, I ask either the bystander version or the footbridge version of the moral trolley problem (Appendix Figure A.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.

As prima facie verification of my experimental platform, 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 to divert the trolley to kill one to save five others. As shown in Table 1, the percentage of workers making the utilitarian choice is higher for the bystander scenario (80%) than for the footbridge scenario (31%). Among the 200,000 individuals who have taken the moral trolley problem (Miller 2008), 80% is also the percentage of subjects who make the utilitarian

choice in the bystander scenario while 30% is the percentage of subjects who make the utilitarian choice in the footbridge scenario (Copp 2010; Appiah 2008; Prinz 2007; Greene et al. 2010). Moreover, consistent with research on the universal moral grammar (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 saved or sacrificed are colored to appear light-skinned or dark-skinned (see Appendix Figure A.5 for the full set of illustrations that accompany the moral trolley problem and the online version for the original coloration). I vary skin color to investigate where people draw the line between ingroups and outgroups and whether competition makes them more utilitarian regarding outgroup members. The reason for this treatment variation is that classical political economists suggest that markets overcome tribal isolation and at least some conflicts are related to incommensurate differences of different groups (Bowles and Polania-Reyes 2012; Chen 2014, 2005, 2008), e.g., along the lines of race (Chen 2013; Chen and Yeh 2014b), gender (Chen and Yeh 2014a,c; Chen et al. 2014a; Chen 2004), and class (Chen 2011).

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 (Appendix Figure A.6). I then ask for demographic characteristics (Appendix Figure A.7), including gender, age, country (the categories in the subsequent regressions are the United States and India, and the omitted category is other), religion (the categories in the subsequent regressions are: Christian, Hindu, Muslim, and Atheist, and the omitted category is other[5]), frequency of religious attendance (never, once a year, once a month, once a week, or multiple times a week; these are coded as 0-4), and ethnicity (White, Black, Hispanic, Asian/Pacific Islander[6], or Native American[7]).

Using self-reported ethnic identity is imperfect since the perception of skin color can vary in a manner not captured by ethnic identity. However, to the extent individuals are categorized incorrectly as White when they perceive themselves as dark-skinned and non-White when they perceive themselves as light-skinned, this would lead all the results of the other-regarding preferences tests that follow to be underestimated. I explore the extent this is a problem for workers from India, where skin color varies dramatically and self-identification for skin color may be more accurate than coding "Asian/Pacific Islander" as non-White. For the small subset of workers whose IP addresses can be traced to a geographic location, I recode Asians as White or non-White depending on the predominant skin tone in the region.

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[5]These include Jewish, Buddhist, Sikh, Agnostic, Transcendantalism, and prefer not to answer.
[6]The omitted race category is Asian in the analyses that include White, Black, and Hispanic.
[7]There are no Native Americans in the study.

The results that follow strengthen slightly with this recoding. I also find that some workers in India self-identify as White or Black, so it is possible that workers are actually reporting their self-perceived skin color.

I did not inquire about subjects' previous experience with the moral trolley problem; however, exposure to moral philosophy has not been found to affect decision-making in the moral trolley problem (Hauser et al. 2007). Hauser et al. also finds that moral trolley responses in a web-based interface are similar to those in a paper interface.

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 United States and India respectively. 32% are Christian, 30% are Hindu, 24% are atheist, and 4% are Muslim. The average age is 30. The average religious attendance is between once a year and once a month. 53% are White, 39% are Asian/Pacific Islander, 5% are Black, and 5% are Hispanic.[8] 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:

$$(7) \quad Utilitarian_{it} = \beta_0 + \beta_1 Treatment_t + \beta_2 X_{it} + \varepsilon_{it}$$

where $Utilitarian_{it}$ 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. Because of the random assignment of workers to treatment conditions, the treatment effects will be unbiased, but including the controls X_i, will be more efficient and reduce the standard errors of the treatment effect being considered if the controls are significant predictors of the outcome variable. For instance, since the *Footbridge scenario* strongly negatively predicts the *Utilitarian* choice, *Footbridge scenario* will always be controlled for when predicting *Utilitarian*

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

even when *Footbridge scenario* is not the treatment of interest in the analyses below.

4   Results

4.1   The Effect of Competition on Utilitarian Values   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; of the 90 workers assigned the tournament condition, 49% made the utilitarian choice. The difference is entirely due to 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.

In a control experiment, I measure the baseline. This control experiment asks workers to enter one paragraph and then immediately answer the moral trolley dilemma. Competition increases deontological commitments, particularly in the footbridge scenario. This finding can be seen in Figure 3, which displays for each treatment interaction, the percentage of workers making utilitarian choices in the moral trolley problem (the red X's mark the baseline: how workers make utilitarian choices in the absence of treatment).[9]

The sample size in the control experiment is 89. The summary statistics are as follows:

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

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

$$(8) \quad Utilitarian_i = \beta_0 + \beta_1 Competition_i + \beta_2 Deontological Scenario_i + $$
$$\beta_3 Competition_i \times Deontological Scenario_i + \beta_4 X_i + \varepsilon_i$$

where β_3 is the coefficient of interest. Marginal effects from probit regressions give similar results (compare Columns 5 with 7, and 6 with 8).[10] 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).

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

[10]Marginal effects from probit regressions give quantitatively similar estimates in all subsequent models so I will not discuss them further.

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 β_3 are found in Columns 4 and 6 and they are statistically significant at the 5% or 1% level. The increase in deontological commitments by tournament workers is therefore particularly strong when workers respond to the footbridge scenario.

4.2 The Effect of Competition on Other-Regarding Preferences   My second result is that workers who were assigned to tournament work are more deontological towards outgroups 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. To investigate this formally, I estimate the following specification:

$$
\begin{aligned}
Utilitarian_i = \beta_0 &+ \beta_1 White_i + \beta_2 DarkIllustration_i + \beta_3 Competition_i + \\
&\beta_4 White_i \times DarkIllustration_i + \beta_5 White_i \times Competition_i + \\
\beta_6 DarkIllustration_i &\times Competition_i + \beta_7 White_i \times DarkIllustration_i \times \\
&Competition_i + \beta_8 X_i + \beta_9 DeontologicalScenario_i + \varepsilon_i
\end{aligned}
$$

(9)

One coefficient of interest is β_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 β_7, which captures whether competition increases utilitarian commitments towards outgroups. As Table 3 illustrates, White workers in the piece-rate setting are 38% more likely than non-White workers to make the utilitarian choice when presented a dark-skinned illustration, but White workers in the tournament setting are 24% less likely to make the utilitarian choice when presented a dark-skinned illustration (0.384 – 0.627 in Column 6).

The estimated effects from Column 6 are as follows:

1. $Pr\{Util|White, Dark, PR\} - Pr\{Util|White, Light, PR\} = -.233 + .384 = .151$

2. $Pr\{Util|Non-White, Light, PR\} - Pr\{Util|Non-White, Dark, PR\} = .233$

3. $Pr\{Util|White, Dark, T\} - Pr\{Util|White, Light, T\} = -.233 + .384 + .515 - .627 = .039$

4. $Pr\{Util|Non-White, Light, T\} - Pr\{Util|Non-White, Dark, T\} = .233 - .515 = -.282$

- $1+2 = .384$ and $3+4 = .384$-$.627 = -.243$ (DD: whites to non-whites)
- $3-1 = -.112$ and $4-2 = -.515$ (DD: tournament vs. piece-rate)

Estimates for β_7 are statistically significant at the 1% or 10% level and comparable across Columns 2, 4, and 6. This effect is shown in Figure 4 to come more strongly from non-Whites (47% of the sample). The Red X's again indicate the baseline. They suggest that competition had a strong effect in increase deontological commitments towards outgroups for non-white workers. The summary statistics from the control experiment described in the previous section are as follows:

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

The fifth and seventh bar indicate that non-Whites particularly become more deontological towards outgroup 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. Moreover, from both the visual display and the table, one can observe that workers are somewhat more utilitarian towards outgroups. (The coefficient on the interaction term between *White* and *Dark Illustration* displays this relationship in Table 3. From the previous discussion of Column 6, 1+3 indicate how much more utilitarian whites are in the dark illustration and 2+4 indicate how much more utilitarian non-whites are in the light illustration.) Thus far, these results indicate that piece-rate workers display more utilitarian commitments and more utilitarian commitments towards outgroups than do tournament workers.

The aforementioned specification in equation (9) actually tests three hypotheses simultaneously: whether the color of the figures in the moral trolley illustration makes salient outgroup considerations, whether individuals are more utilitarian towards outgroups, and whether market interactions affect how utilitarian individuals are towards outgroups. Equation (9) does not independently show whether the dark-skinned illustration made salient outgroup considerations for Whites (or whether light-skinned illustration primes outgroup considerations for non-Whites). To validate that the moral trolley illustrations do in fact make outgroup considerations salient, I estimate:

(10) $\quad Donate_i = \beta_0 + \beta_1 White_i + \beta_2 DarkIllustration_i +$
$\qquad \beta_3 White_i \times DarkIllustration_i + \beta_4 X_i + \varepsilon_i$

where the coefficient of interest is β_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). There is a large literature on the differential treatment of outgroup members (Bertrand and Duflo 2016), whose roots may be tied to the sharing or provision of public goods (Chen 2010, 2006; Chen and Lind 2007, 2014; Chen and Sethi 2011; Chen et al. 2014c, 2016). 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 and this difference is statistically significant at the 5% or 10% level.

Figure 5 graphically displays the differences-in-differences analyses of the effect of outgroup priming on charitable donations. White workers are 29% less likely than non-White workers to donate to charity when presented a dark-skinned illustration of a moral dilemma than when presented a light-skinned illustration of a moral dilemma. To unpack this statistic, 41% of White workers donate when presented a dark-skinned illustration, 55% of White workers donate when presented a light-skinned illustration, 50% of non-White workers donate when presented a dark-skinned illustration, and 34% of non-White workers donate when presented a light-skinned illustration. This finding is perhaps unsurprising since campaign or donation advertisements can make racial attitudes salient by tying particular narratives to the race of individuals in those narratives (Hutchings and Valentino 2004; Fong and Luttmer 2009). What is perhaps surprising is that in this study, there is no explicit connection between the illustration and the donation narrative. Workers may have made the connection between the race of the individuals that are objects of sacrifice who appear to be in need to the race of the individuals who may benefit from the Red Cross or the Red Crescent donation.

4.3 The Effect of Competition on Charitable Donations

My third set of results is as follows. Tournament winners are more likely to donate than tournament losers or piece-rate workers. Workers do not know they are tournament winners or losers at the time they make their decisions. 51% of piece-rate workers choose to donate and 41% of tournament workers choose to donate. We may, however, be interested in the effect of tournaments among tournament winners since they are the ones likely to gain market share in a competitive envi-

ronment. 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 et al. 1994). However, Kidd et al. (2013) found that tournament winners donate more in a design where tournament outcomes are also known. One reason for the difference with Hoffman et al. (1994) is that the subjects may know 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.

Overall, workers in the tournament setting are about 15% less likely to donate to the Red Cross or the Red Crescent (Table 5), as can be seen from estimating:

$$(11) \quad Donate_i = \beta_0 + \beta_1 Competition_i + \beta_2 X_i + \varepsilon_i$$

An important outcome to study among the effects of competition is the behavior of market winners, as their behavior may be more likely to persist in an efficient market. In the tournament, winners are more likely to donate to charity. Table 6 presents estimates of the specification:

$$(12) \quad Donate_i = \beta_0 + \beta_1 Winner_i + \beta_2 X_i + \varepsilon_i$$

where β_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 β_1 in Columns 1 and 2 represent about 50% of the overall donation rate and are statistically significant at the 5% level. 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 their status as winners when making decisions 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 or the 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.

However, it may still be the case that more productive workers, not tournament winners, are more charitable. 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 relative to non-productive workers? 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 an individual's error rate with those of 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 6 graphically displays the differences-in-differences analysis of the effect of tournaments on charitable donations by tournament winners. Moreover, in the control experiment, the relationship between log error rate and donation is small and slightly positive with a t-statistic of 0.87.

In sum, these results suggest that, competition caused productive workers to become more generous relative to non-productive workers. This is consistent with the evidence that individuals in more market-oriented countries tend to be more charitable (Alesina and Glaeser 2004). However, we do not know whether competition encourages workers who are *generally* productive to donate, or specifically encourages workers who are productive *during tournaments* to donate. Figure 6 suggests the former is not the mechanism because productive individuals in the piece rate treatment donate at similar rates as productive individuals in the tournament treatment, which suggests that competition encourages workers who are productive during tournaments to donate.

4.4   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 Appendix Table A.1) and statistically significant at the 1% level. I present estimates of the specification:

(13) $LogError_i = \beta_0 + \beta_1 Competition_i + \beta_2 X_i + \varepsilon_i$

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 subjects learn their payment scheme, and, in fact, a formal estimation confirms that treatment does not affect pre-treatment error

rates (Column 4). The magnitudes are sizable. The average log post-treatment error rate is 2.8 for non-attriters, so the coefficient of 0.37 in Column 3 suggests that piece-rate conditions increase log error rates by 13%.

The finding that competition increases productivity is not surprising and is consistent with the findings of Gneezy and Rustichini (2000)[11] and Bandiera et al. (2005), who find that relative incentives decrease output when workers can monitor colleagues and internalize the negative externalities their effort imposes on coworkers and friends but do not when workers cannot monitor. The workers in this study may not internalize the negative externality that competition imposes on other workers in the anonymous, non-monitoring setting of a LMI.

4.5   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. In the early stages of economic development, economists thought that commerce increased morality, but in the later stages of economic development, economists thought that commerce decreased morality (Hirschman 1982). Is this variation over economic development reflected in the experiment? 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, market competition may trigger different emotions at different stages of economic development. It is possible that market competition is perceived to be unfair early in the course of economic development, thereby triggering negative emotions. Further, the distance between individual effort and pay is correlated with unhappiness (see, e.g., DeVoe and Pfeffer 2009), which can cause deontological responses to moral judgments (Wheatley and Haidt 2005; Schall et al. 2008). As markets develop, however, markets become perceived as fair or, at least, unsurprising as a reference point (Kahneman et al. 1986). This perspective provides an economic rationale for the changing views towards the *doux commerce* thesis.

Table 8 examines the effect of competition on utilitarian values as it varies by country income. It displays estimates of the specification:

$$(14) \quad Utilitarian_i = \beta_0 + \beta_1 Competition_i + \beta_2 LnGDP_i + \beta_3 Competition_i \times LnGDP_i +$$
$$\beta_4 X_i + \beta_5 DeontologicalScenario_i + \varepsilon_i$$

where β_3 is the coefficient of interest. Income data is obtained from the World Economic

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[11]They also find that males respond more to tournament incentives than do females. Males respond to tournament incentives more than females do in my study as well.

Outlook Database (IMF 2009).[12] 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 competition's amplifying effect on 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 β_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 statistically significant at the 5% or 10% level (it is not statistically significant at the 10% level in Column 5) and robust to using a threshold measure of income, e.g., splitting the sample roughly in half where high income is defined as GDP PPP per capita above 30,000.[13] The estimates of β_3, however, should be considered cautiously. Although the moral trolley problem is cultural neutral (Mikhail 2007), and I designed the transcription task to be culturally neutral as well, correlates of income could explain this reversal. When dummy variables for being American and being Indian are also interacted with market experience, β_3 weakens in statistical significance. The effect of competition on donations also reverses with income and becomes negative at the highest income levels (Columns 6-10), which would be consistent with the notion that piece rate workers experience negative emotions in developed countries and the findings that positive emotions increase donations (Isen 1987; Schall et al. 2008). However, the coefficient on the interaction term is not statistically significant at the 10% level.

5   Alternative Interpretations and Limitations

Thus far, I have shown that competition increases deontological values, increases deontological values towards outgroups, and increases donations among productive workers relative to non-productive workers. In this section, I consider a number of alternative interpretations and limitations for these findings.

Briefness: First, the briefness of the study makes it more akin to a priming experiment (see, e.g., Benjamin et al. (2010) arguing that the priming of social identity helps examine the causal effect of social identity on preferences). I do not know whether market experience has long-term effects on normative commitments once an individual is removed from that market environment. Furthermore, the individuals participating in the study are already embedded in the market. Individuals who move from not being embedded to being embedded may behave differently from those in a marginal intervention that shifts the degree or type of

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[12]http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx

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

market embeddedness. That said, priming and its related emotional affects may be present even with long-term exposure (Berdejó and Chen 2014).

Confounds: 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 2009). With the ever-present threat of an employer's rejecting the employee's work, the tournament condition is less likely to contribute to this awareness in a significant way.

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

Subjects' Beliefs: 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 et al. 2003; Krajbich et al. 2009; Roth and Murnighan 1982), this perception would predict increased deontological commitments since negative emotions can cause deontological responses to moral judgments. Workers from poorer countries who fear they are competing against workers from wealthy countries could view these tournaments as unfair. Presenting data entry of Tagalog transcriptions, to which a country's income is unlikely to lend comparative advantage, mitigates this concern, and, global labor markets is one dimension of increased labor market competition.

Awareness: Fifth, it is possible that workers may become aware of an ongoing study, if their suspicions are aroused by the moral trolley problem. However, this suspicion does not cause individuals to attrite at a high rate. Moreover, experimenter demand effects are

still unlikely to play a role since subjects are not aware of the other treatment conditions so would have difficulty to intuit what is their experimental treatment. Even if subjects exposed to piece rate and then tournament think they should be responding in a more deontological fashion, this response should be observed in both the footbridge and bystander scenario. Finally, in the control experiment that recruits subjects in the same manner with data entry work, the shift from data entry to the moral trolley problem results in responses to the footbridge and bystander scenarios that corresponds to the average response in the population in the main results.

Contract Change: Sixth, the lock-in task minimizes attrition. But workers may respond merely to a change in contract conditions midway through the experiment rather than to a change from 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 3). Moreover, if workers are offended by the change in contract conditions as they are when they face a wage cut (Chen and Horton 2014), they can quit at any time, yet attrition is on the order of 10% and similar across treatment interactions.

Attrition: Seventh, 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.[14] 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.[15] For the estimates of the effect of competition on

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[14]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.

[15]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.

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.

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

Context: Eighth, these measures of ethical behavior are somewhat decontextualized, like the Implicit Association Test and surveys of time preferences (Beaman et al. 2009; Ashraf et al. 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 and Schonger (2013; 2015) develop methods to detect non-consequentialist motivations through revealed preference. Competition can be superimposed on these methods.

Other Mechanisms: Scholars of the *doux commerce* thesis were unclear about the particular mechanism through which a competitive market could affect morality. The main focus of this study is to investigate the potential average effect of tournaments on three forms of normative commitments. Extensions of the experimental setting can include the use of wage pay as an alternative to piece rate and tournaments; charity work as opposed to paid work; cooperation as opposed to competition; and degree of disintermediation of responsibility. Donations can be made to workers who lost the tournament rather than to third parties. All of these are fruitful avenues for exploring the effects of different dimensions of the market experience on moral judgment, conceptions of rights, and duties (Chen 2015).

Setting: Other settings entail hypotheses that can be explored with data in naturally-occurring settings. The 2001 Enron case and the global financial crisis of 2007-2009 have given researchers new reason to consider appropriate policies to address the shaping of ethics, particularly as they relate to financial markets. If the high bonus structure characterizing many modern up-or-out competitive promotion regimes leads to utilitarian judgment, then restricting bonuses of Wall Street financiers may make them more deontological and duty-oriented–a consequentialist argument in lieu of Kantian ones that favor restricting bonus pay (Sandel 2010). In the case of doctors, the potential effect of highly incentivized structures on doctors' duty of care provides a complementary argument for restricting conflicts of interest

payments (Inderst and Ottaviani 2012; Chen et al. 2014b). For politicians, if those who win close competitive elections become more utilitarian, this perspective suggests another, behavioral, reason besides inability to commit as to why competition for votes does not induce politicians to move towards the center (Lee et al. 2004). Finally, consider judges whose decisions may reflect deontological vs. utilitarian value choices. For example, judges who use law and economics phrases (in cases other than the current case) are more likely to vote for and render conservative verdicts (Ash et al. 2016; Chen et al. 2015). If competitive selection cause judges to become more utilitarian, this perspective may help explain the progression of U.S. judges towards utilitarianism that characterizes the law and economics movement more so than judges in other countries.

6   Conclusion

The increase in deontological values both overall and towards outgroups along with tournament winners' greater willingness to donate to charity relative to tournament losers suggests that, along both economic and philosophical dimensions, the moral influences of competition are ameliorative in ways that philosophers and economists have traditionally considered ameliorative, at least in the earlier stages of economic development. 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. That the effect of competition on deontological commitments reversed with income of the worker's country suggests that the beneficial effects of market competition on moral values may be particularly strong in developing countries. This hypothesis is consistent with earlier studies that found greater cooperation in experimental games in developing societies with greater market integration (Henrich et al. 2001); the hypothesis is also consistent with concerns that market competition may lose moral constraints after a certain level of economic development (Smith 1998).

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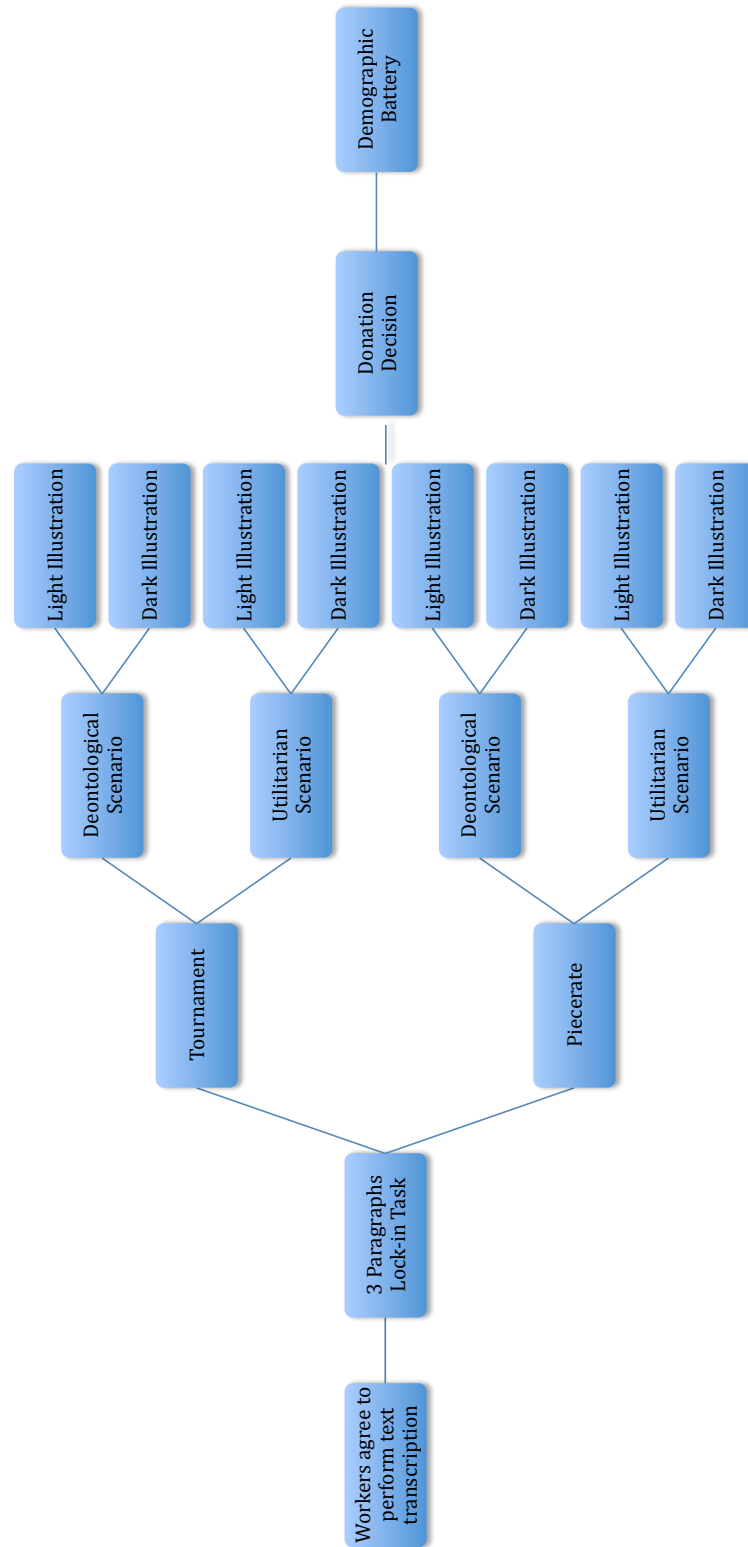
FIGURE 2.— Experimental Design

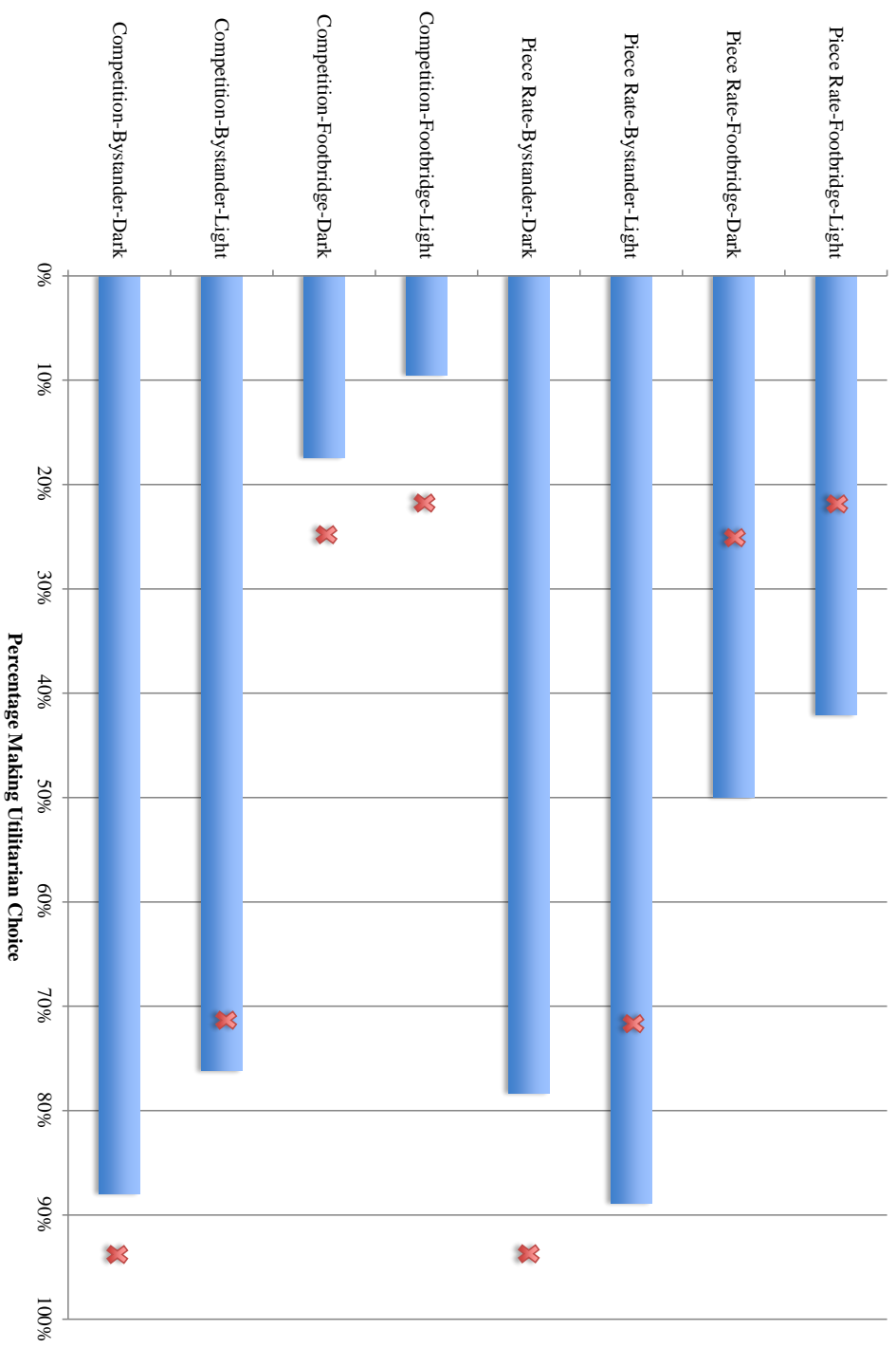FIGURE 3.— The Effect of Competition on Deontological Commitments

FIGURE 4.— The Effect of Competition on Other-Regarding Preferences
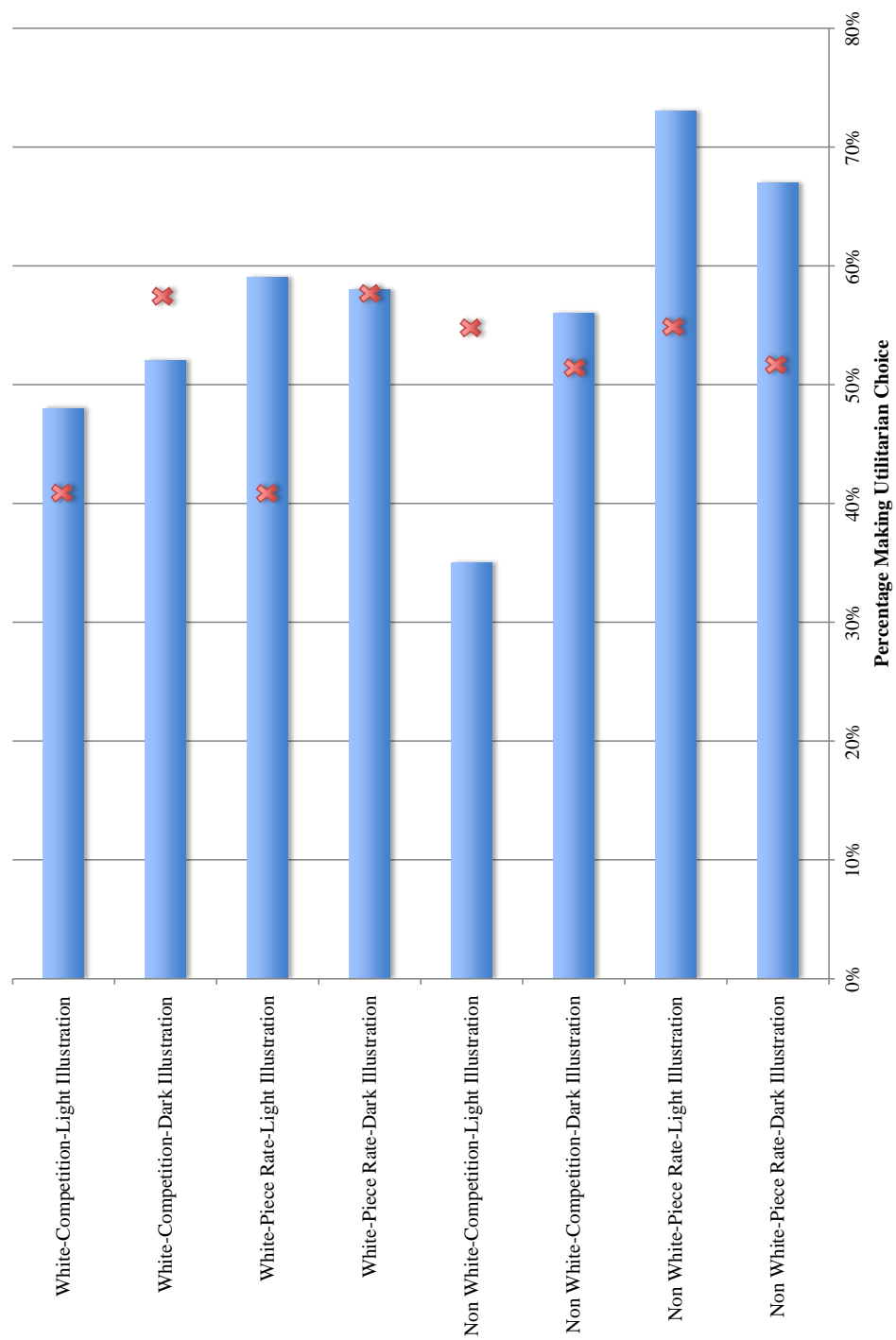
FIGURE 5.— The Effect of Outgroup Priming on Charitable Donations
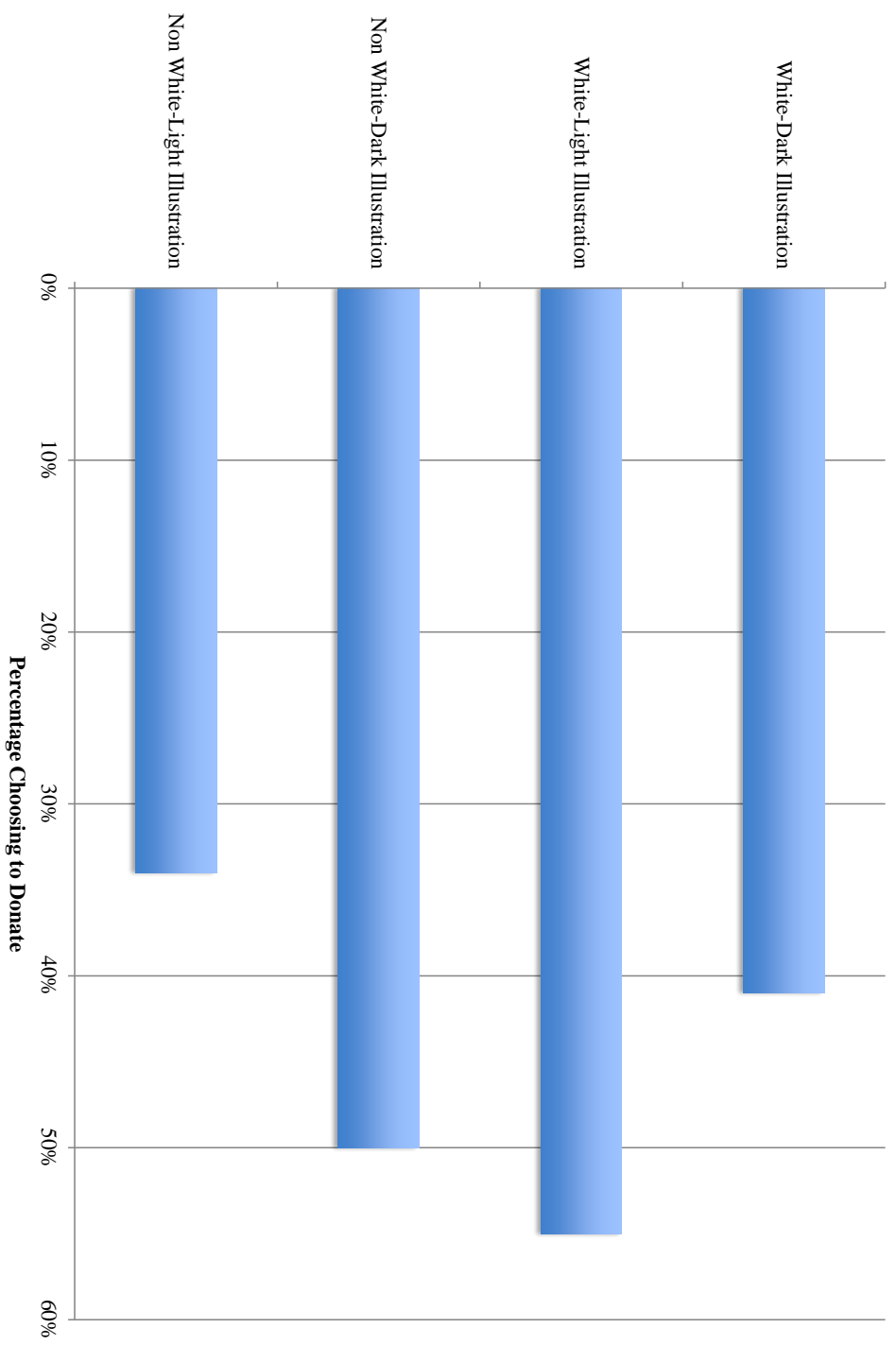
FIGURE 6.— The Effect of Competition on Charitable Donations

Percentage Choosing to Donate
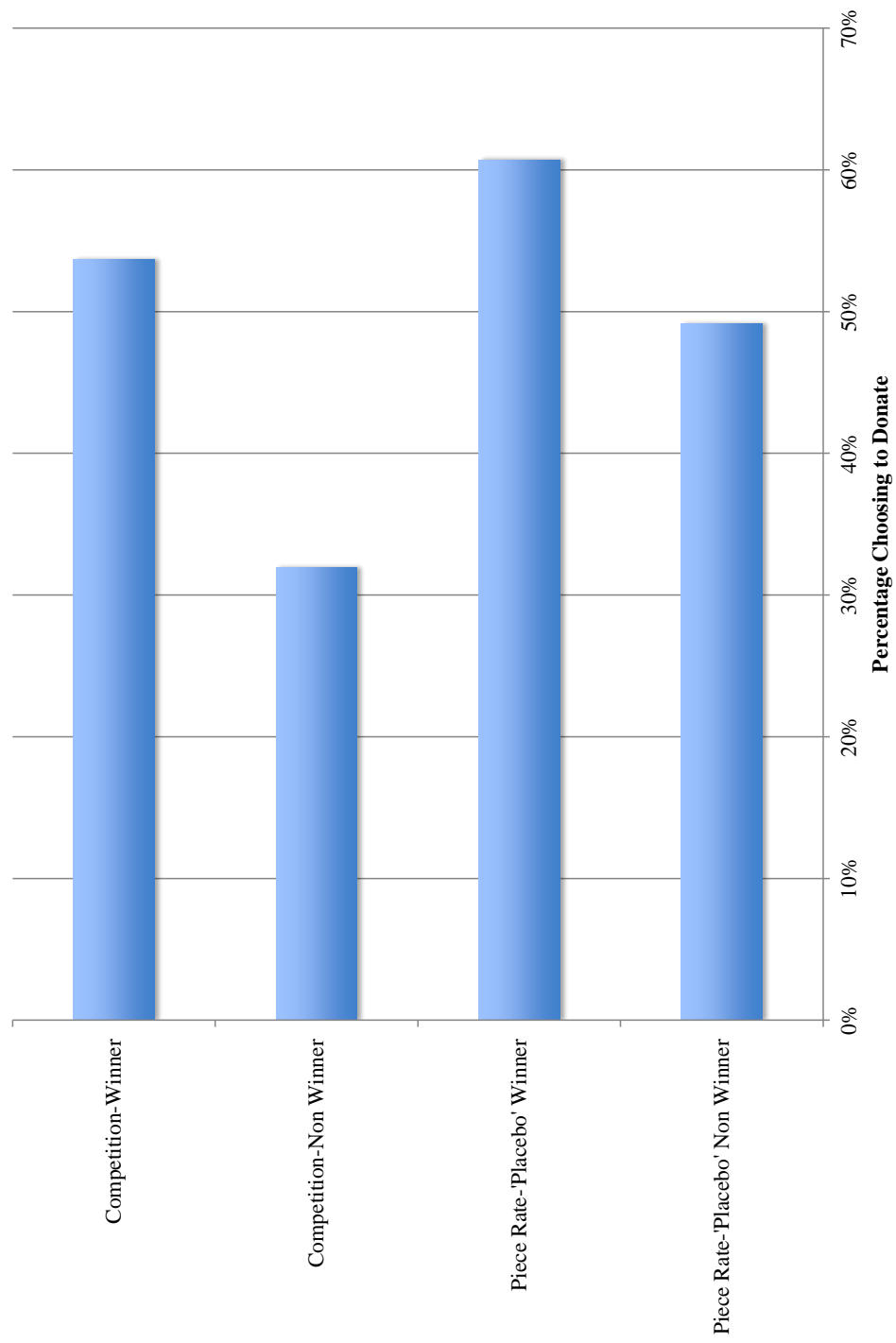
TABLE I

Summary Statistics

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

TABLE II

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***		-0.525***	-0.360***	-0.549***	-0.387***	-0.608***	-0.464***
	(0.0636)		(0.0625)	(0.0871)	(0.0642)	(0.0892)	(0.0660)	(0.106)
Competition		-0.144*	-0.174***	-0.00318	-0.155**	0.00914	-0.220**	-0.0105
		(0.0736)	(0.0625)	(0.0884)	(0.0657)	(0.0909)	(0.0906)	(0.137)
Competition * Footbridge Scenario				-0.330***		-0.318**		-0.379**
				(0.123)		(0.124)		(0.164)
Dark Illustration					0.0880	0.0890	0.113	0.118
					(0.0669)	(0.0658)	(0.0938)	(0.0954)
Male					0.114*	0.105	0.178*	0.169*
					(0.0681)	(0.0671)	(0.0918)	(0.0946)
Age					-0.00381	-0.00355	-0.00547	-0.00483
					(0.00317)	(0.00312)	(0.00440)	(0.00448)
American					-0.151	-0.137	-0.229	-0.202
					(0.124)	(0.122)	(0.175)	(0.179)
Indian					0.106	0.111	0.173	0.206
					(0.200)	(0.197)	(0.267)	(0.276)
Christian					-0.108	-0.128	-0.188	-0.212
					(0.124)	(0.122)	(0.181)	(0.186)
Hindu					-0.0968	-0.137	-0.203	-0.280
					(0.181)	(0.179)	(0.260)	(0.267)
Muslim					-0.241	-0.270	-0.363	-0.413**
					(0.204)	(0.201)	(0.237)	(0.209)
Atheist					-0.120	-0.108	-0.223	-0.198
					(0.131)	(0.129)	(0.186)	(0.192)
Religiousness					0.0299	0.0393	0.0380	0.0507
					(0.0300)	(0.0298)	(0.0441)	(0.0453)
White					0.144	0.138	0.200	0.188
					(0.101)	(0.0994)	(0.138)	(0.141)
Black					0.253	0.260*	0.344***	0.355***
					(0.156)	(0.154)	(0.120)	(0.126)
Hispanic					0.138	0.150	0.183	0.192
					(0.146)	(0.144)	(0.169)	(0.171)
Log GDP PPP per capita					0.0195	0.0117	0.0408	0.0280
					(0.0815)	(0.0802)	(0.114)	(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 III

OTHER-REGARDING PREFERENCES - THE EFFECT OF COMPETITION ON UTILITARIANISM TOWARDS OUTGROUPS

| | Ordinary Least Squares | | | | Probit | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
	Utilitarian	Utilitarian	Utilitarian	Utilitarian	Utilitarian	Utilitarian
Footbridge Scenario	-0.521***	-0.539***	-0.551***	-0.568***	-0.586***	-0.639***
	(0.0641)	(0.0631)	(0.0657)	(0.0643)	(0.0657)	(0.0664)
White	-0.0759	-0.281**	0.0889	-0.185	0.115	-0.278
	(0.0985)	(0.141)	(0.123)	(0.161)	(0.162)	(0.217)
Dark Illustration	0.0453	-0.146	0.0756	-0.142	0.0954	-0.233
	(0.0962)	(0.135)	(0.0971)	(0.136)	(0.128)	(0.185)
White * Dark	0.0175	0.244	0.0155	0.276	0.0284	0.384**
Illustration	(0.130)	(0.182)	(0.131)	(0.183)	(0.172)	(0.190)
Competition		-0.454***		-0.504***		-0.678***
		(0.148)		(0.152)		(0.150)
White *		0.382**		0.464**		0.555***
Competition		(0.192)		(0.198)		(0.146)
Dark Illustration *		0.348*		0.402**		0.515***
Competition		(0.188)		(0.190)		(0.156)
Dark Illustration *		-0.428*		-0.502*		-0.627***
Competition * White		(0.255)		(0.257)		(0.144)
Male			0.119*	0.136**	0.167*	0.209**
			(0.0697)	(0.0687)	(0.0903)	(0.0940)
Age			-0.00381	-0.00510	-0.00447	-0.00734
			(0.00324)	(0.00322)	(0.00432)	(0.00452)
American			-0.0781	-0.146	-0.108	-0.227
			(0.124)	(0.124)	(0.171)	(0.182)
Indian			-0.0333	0.0701	-0.0609	0.128
			(0.200)	(0.199)	(0.265)	(0.277)
Christian			-0.114	-0.120	-0.186	-0.195
			(0.127)	(0.124)	(0.171)	(0.184)
Hindu			-0.0196	-0.137	-0.0684	-0.236
			(0.183)	(0.183)	(0.247)	(0.267)
Muslim			-0.232	-0.267	-0.330	-0.369
			(0.208)	(0.205)	(0.239)	(0.244)
Atheist			-0.0897	-0.132	-0.167	-0.236
			(0.134)	(0.132)	(0.179)	(0.189)
Religiousness			0.0356	0.0302	0.0471	0.0400
			(0.0309)	(0.0302)	(0.0425)	(0.0445)
Log GDP PPP			-0.0237	0.0225	-0.0369	0.0494
per capita			(0.0820)	(0.0823)	(0.109)	(0.118)
Observations	180	180	180	180	180	180
R-squared	0.278	0.326	0.336	0.385		

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

TABLE IV

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 V

THE EFFECT OF COMPETITION ON CHARITABLE DONATIONS

| | Ordinary Least Squares | | Probit |
| | (1) | (2) | (3) |
	Donate	Donate	Donate
Competition	-0.100	-0.143*	-0.162**
	(0.0743)	(0.0775)	(0.0818)
Footbridge		-0.0664	-0.0754
Scenario		(0.0757)	(0.0808)
Dark Illustration		0.0101	0.0125
		(0.0789)	(0.0845)
Male		0.0462	0.0519
		(0.0803)	(0.0861)
Age		0.00891**	0.00985**
		(0.00374)	(0.00402)
American		0.147	0.170
		(0.146)	(0.154)
Indian		-0.256	-0.300
		(0.236)	(0.234)
Christian		-0.108	-0.111
		(0.146)	(0.151)
Hindu		-0.357*	-0.364**
		(0.214)	(0.184)
Muslim		-0.185	-0.197
		(0.241)	(0.217)
Atheist		-0.0261	-0.0171
		(0.154)	(0.166)
Religiousness		0.0327	0.0370
		(0.0354)	(0.0376)
White		-0.209*	-0.264**
		(0.119)	(0.134)
Black		-0.0857	-0.109
		(0.184)	(0.205)
Hispanic		-0.111	-0.149
		(0.172)	(0.192)
Log GDP PPP		-0.103	-0.118
per capita		(0.0961)	(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 VI
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**	0.248**	0.267**	-0.0168	-0.0354	-0.0447
	(0.104)	(0.116)	(0.119)	(0.0787)	(0.0891)	(0.147)
Footbridge Scenario		-0.0951	-0.108	-0.689***	-0.687***	-0.723***
		(0.111)	(0.114)	(0.0777)	(0.0855)	(0.0802)
Dark Illustration		0.0452	0.0560		0.114	0.188
		(0.121)	(0.124)		(0.0930)	(0.150)
Male		-0.0480	-0.0413		0.0936	0.159
		(0.121)	(0.122)		(0.0932)	(0.147)
Age		0.00896	0.00979*		-0.00332	-0.00503
		(0.00561)	(0.00565)		(0.00433)	(0.00706)
American		0.123	0.145		-0.120	-0.184
		(0.199)	(0.204)		(0.154)	(0.255)
Indian		0.341	0.378		-0.0163	-0.104
		(0.369)	(0.350)		(0.285)	(0.543)
Christian		-0.0758	-0.0794		0.00174	0.0470
		(0.218)	(0.213)		(0.168)	(0.316)
Hindu		-0.321	-0.318		-0.0741	-0.0824
		(0.273)	(0.208)		(0.211)	(0.368)
Muslim		-0.348	-0.309*		-0.293	-0.383
		(0.346)	(0.187)		(0.267)	(0.257)
Atheist		0.162	0.196		-0.0750	-0.0604
		(0.240)	(0.244)		(0.185)	(0.322)
Religiousness		0.0509	0.0607		0.0180	0.0341
		(0.0600)	(0.0612)		(0.0463)	(0.0858)
White		-0.366	-0.399*		0.0284	0.0197
		(0.226)	(0.217)		(0.174)	(0.310)
Black		-0.108	-0.115		0.00605	0.00414
		(0.297)	(0.298)		(0.229)	(0.397)
Hispanic		-0.134	-0.159		0.0733	0.170
		(0.338)	(0.306)		(0.261)	(0.483)
Log GDP PPP		0.100	0.111		0.0264	0.0210
per capita		(0.165)	(0.168)		(0.127)	(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 VII

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

	Ordinary Least Squares (1) Donate	(2) Donate	Probit (3) Donate	Ordinary Least Squares (4) Utilitarian	(5) Utilitarian	Probit (6) Utilitarian
'Placebo' Winner	0.115	0.111	0.381	-0.136	-0.123	-0.317
	(0.116)	(0.123)	(0.364)	(0.104)	(0.113)	(0.404)
Footbridge Scenario		-0.0612	-0.184	-0.361***	-0.383***	-1.440***
		(0.108)	(0.326)	(0.0954)	(0.0999)	(0.390)
Dark Illustration		-0.0761	-0.272		0.101	0.272
		(0.115)	(0.337)		(0.106)	(0.374)
Male		0.0548	0.143		0.123	0.677
		(0.123)	(0.372)		(0.113)	(0.426)
Age		0.0103*	0.0325*		-0.00289	-0.0109
		(0.00570)	(0.0173)		(0.00527)	(0.0170)
American		0.00687	0.149		-0.198	-1.044
		(0.259)	(0.753)		(0.239)	(0.960)
Indian		-0.857*	-7.887		0.767	7.683***
		(0.500)	(.)		(0.462)	(1.260)
Christian		-0.197	-0.805		-0.337*	-1.309*
		(0.217)	(0.737)		(0.201)	(0.693)
Hindu		-0.117	3.654**		-0.837	-7.161
		(0.550)	(1.623)		(0.509)	(.)
Muslim		0.0384	4.018**		-0.606	-1.428
		(0.443)	(1.907)		(0.409)	(1.577)
Atheist		-0.318	-1.117		-0.202	-0.942
		(0.217)	(0.752)		(0.200)	(0.676)
Religiousness		-0.00970	-0.00830		0.0456	0.0655
		(0.0490)	(0.149)		(0.0453)	(0.172)
White		-0.273*	-1.369*		0.166	0.397
		(0.161)	(0.707)		(0.149)	(0.518)
Black		-0.143	-0.657		0.461*	
		(0.252)	(0.930)		(0.233)	
Hispanic		-0.146	-0.790		0.152	0.542
		(0.208)	(1.001)		(0.193)	(0.635)
Log GDP PPP per capita		-0.106	-0.606		0.0329	0.613
		(0.145)	(0.668)		(0.134)	(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 VIII

THE EFFECT OF COMPETITION ON UTILITARIAN VALUES OVER ECONOMIC DEVELOPMENT

| | Ordinary Least Squares | | | Probit | | Ordinary Least Squares | | | Probit | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
	Utilitarian	Utilitarian	Utilitarian	Utilitarian	Utilitarian	Donate	Donate	Donate	Donate	Donate
Footbridge	-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

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

Transcribe Text

Instructions:

- After you have read the instructions, go to this site to begin work: <u>Click Here</u>
- Copy text exactly as it appears in the scanned image.

Payment:

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

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

Enter completion code here:

| |

Appendix Figure A.2: First Page at External Host

Transcribe Text

Instructions:

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

Payment:

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

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

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

Would you like to continue?

Appendix Figure A.3: Second Page at External Host

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

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

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

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

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

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

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

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

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

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

Payment:
You will be paid 10 cents per paragraph.

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

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

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

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

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

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

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

Appendix Figure A.5: Moral Trolley Problem

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

Light
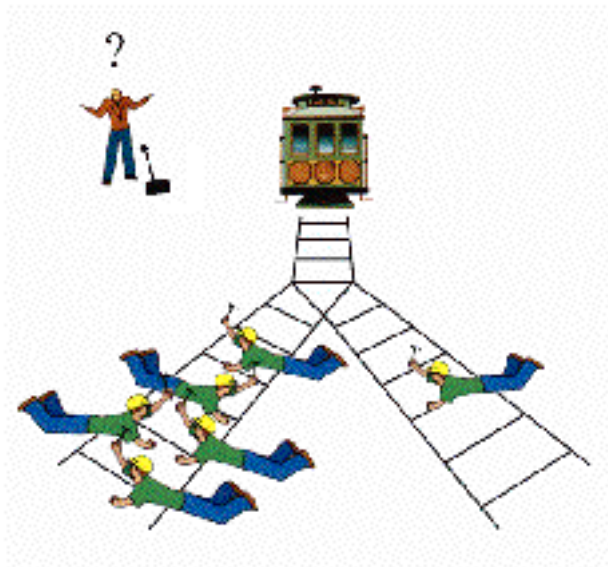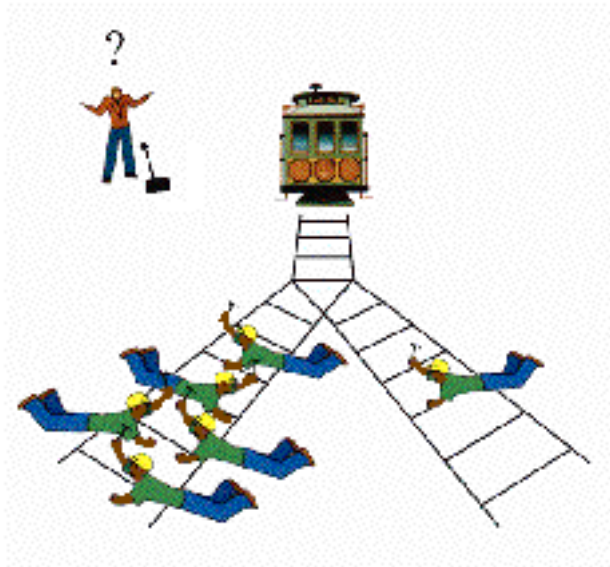

Bystander   Footbridge

Dark

Bystander   Footbridge

Bystander version:

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

Footbridge version:

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

No, it is not morally permissible

Yes, it is morally permissible

Appendix Figure A.6: Charitable Donation

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

Red Cross
Red Crescent
No, I am not willing to donate

Appendix Figure A.7: Demographic Survey

What is your gender?

What is your age?

What country do you live in?

What is your religion?

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

    Never

    Once a year

    Once a month

    Once a week

    Multiple times a week

What is your ethnicity?

    White

    Black

    Asian/Pacific Islander

    Hispanic

    Native American

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

Enter the code below AND on the Mechanical Turk website.

APPENDIX TABLE A.1

THE EFFECT OF COMPETITION ON PRODUCTIVITY

	(1)	(2) Log Error Post-Treatment	(3)	(4) Falsification: Pre-Treatment Log Error
Competition	0.573***	-0.470***	-0.372**	-0.266
	(0.176)	(0.179)	(0.168)	(0.182)
Footbridge Scenario		0.132	0.117	0.0396
		(0.174)	(0.162)	(0.178)
Dark Illustration		-0.307*	-0.279	-0.0772
		(0.181)	(0.169)	(0.184)
Male		-0.326*	-0.266	-0.163
		(0.185)	(0.172)	(0.188)
Age		-0.0138	-0.0114	-0.00667
		(0.00856)	(0.00798)	(0.00871)
American		-0.455	-0.346	-0.297
		(0.340)	(0.317)	(0.346)
Indian		1.047*	0.758	0.789
		(0.552)	(0.517)	(0.562)
Christian		0.410	0.341	0.186
		(0.335)	(0.312)	(0.341)
Hindu		0.945*	0.618	0.890*
		(0.484)	(0.455)	(0.493)
Muslim		1.230**	1.120**	0.302
		(0.548)	(0.510)	(0.558)
Atheist		0.631*	0.515	0.318
		(0.358)	(0.334)	(0.365)
Religiousness		0.0459	-0.0256	0.195**
		(0.0813)	(0.0770)	(0.0828)
White		0.549**	0.347	0.550**
		(0.272)	(0.256)	(0.277)
Black		0.799*	0.738*	0.168
		(0.417)	(0.388)	(0.424)
Hispanic		0.809**	0.756**	0.143
		(0.390)	(0.363)	(0.397)
Log GDP PPP per capita		0.357	0.330	0.0747
		(0.225)	(0.209)	(0.229)
Log Error Pre-Treatment			0.367***	
			(0.0729)	
Constant	3.101***	-0.941	-1.492	1.503
	(0.124)	(2.133)	(1.988)	(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.

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