

MPRA

Munich Personal RePEc Archive

Equity versus Equality

James Konow and Tatsuyoshi Saijo and Kenju Akai

Kiel University, Loyola Marymount University, Kochi Institute of
Technology, University of Tokyo

1 December 2016

Online at <https://mpra.ub.uni-muenchen.de/75376/>

MPRA Paper No. 75376, posted 5 December 2016 10:16 UTC

December 2016

Equity versus Equality

By JAMES KONOW, TATSUYOSHI SAIJO AND KENJU AKAI*

Abstract

How should economic output be distributed among those who created it? An expansive theoretical and empirical literature seeks to answer this fundamental, and controversial, question, which has implications, *inter alia*, for the structure of wages, redistributive policies and international agreements. Among the possible fairness rules that have been proposed, the primary rivals are *equality* and *equity*, whereby the latter refers to allocating in proportion to some measure of individual contributions. This paper reports the results of an experiment conducted in the United States and Japan. It investigates a large variety of factors that might affect preferences for equity and equality, including multiple approaches to examining concepts of culture. We find impersonal third parties, or *spectators*, exclusively favour equity. Distributive preferences move incrementally toward equality, however, when subjects share personal stakes (i.e., are *stakeholders*), and even further toward equality, when stakeholder anonymity is lifted. Although the degree of self-interest sometimes differs across countries, these findings about fairness preferences are robust with respect to a wide range of non-ethics variables that seldom matter, including race, income, gender, nationality and culture. We interpret the findings as suggesting that equity is an impersonal (or impartial) rule of fairness, whereas fairness preferences move progressively toward equality with greater *proximity*, i.e., as relationships become more personal through belonging to a group and being non-anonymous.

JEL classification: C91; D03; D63

*Corresponding author: Konow: Chair of Economics and Ethics, Kiel University, Germany, and Department of Economics, Loyola Marymount University, One LMU Drive, Suite 4200, Los Angeles, CA 90045-2659, USA (jkonow@lmu.edu);

Saijo: Institute of Economic Research, Hitotsubashi University, and Research Center for Social Design Engineering, Kochi University of Technology, Japan;

Akai: Project Assistant Professor, Department of Technology Management for Innovation, Graduate School of Engineering, University of Tokyo, Japan.

I certify that I have the right to deposit the contribution with MPRA.

We acknowledge the helpful comments and suggestions of Kjell Arne Brekke, Alexander Cappelen, Rachel Croson, Martin Dufwenberg, Robert Frank, Håkan Holm, Olof Johansson-Stenman, Stephan Kroll, David K. Levine, Karl Ove Moene, Karine Nyborg, John T. Scott, Matthias Sutter, Bertil Tungodden, and participants at various conferences and workshops. Konow thanks the Centre for Equality, Social Organization and Performance and the Centre for the Study of Mind and Nature, both at the University of Oslo, and the Institute of Economic and Social Research at Osaka University, where parts of the research were completed. Saijo acknowledges financial support from the Japanese Ministry of Education, Sports, Science and Technology. We also thank Keiko Aoki, Joseph Earley, Andrew Healy, Kento Onoshiro and Kohei Ueda for their assistance conducting the experiment.

How should economic output be distributed among those who have contributed to its creation? There is scarcely a question in economics more fundamental, or controversial, than this one. The answer has wide-ranging implications for the structure of wages at the firm- and industry-level, for returns to human and property resources, and for the redistribution of income and wealth, both within countries through their domestic policies as well as between countries through treaties and trade agreements. The textbook version of neoclassical economics, with its emphasis on marginal productivity theory and efficiency, seems consistent with (a version of) *equity*. In the social science literature on justice, the term “equity” commonly refers to rewarding individuals in proportion to some measure of their contributions. On the other hand, people often profess a desire for *equality*, a common interpretation of which is strict egalitarianism, i.e., equal allocations irrespective of contributions. Along these lines, many economists as well as many members of the general public have expressed growing concern in recent years about rising economic inequality, as evidenced, for example, by the considerable academic and popular interest in contributions to the topic by Piketty (2014) and Stiglitz (2012). Of course, opposition to current levels of inequality does not by itself allow one to ascertain whether the favoured target is equality or merely less inequality (perhaps still in keeping with equity). It does, however, underscore the great importance of distributive preferences and the value of clarifying the rules governing those preferences.

This study examines preferences for equity and equality and the factors that affect such preferences using variations of a dictator experiment. In our version, subjects in the United States (US) and Japan first perform a task that generates earnings, and then arbitrarily selected “dictators” allocate the earnings to recipients, who have no recourse. The subject matter of this study belongs to distributive justice, here understood to concern the distribution of income and wealth. Within the empirical and theoretical justice literature, equity and equality are the most prominent rivals for fairness principles, but no consensus has yet emerged about whether or when each applies. To our knowledge, this paper reports the most comprehensive study of factors that might affect equity and equality preferences: we consider, inter alia, entitlement, culture, nationality, size of stakes, income, race, gender, and group vs. individual decisions. We employ a laboratory experiment, specifically a non-strategic design, because it allows us to control forces that might otherwise confound inferences from observational data, such as strategic self-interest and a concern for reputation. The design targets both impartial and partial

distributive preferences and analyses possible cultural effects based both on a self-report instrument and on behaviour in a novel treatment designed to induce cultural variation.

Recent theoretical and empirical research underscores the economic, political and social importance of fairness preferences, in particular, as those preferences relate to what constitutes fair and unfair inequality. For example, there is evidence that people accept inequalities due to factors people control (e.g., effort) but reject inequalities resulting from factors people do not control (e.g., luck), including from questionnaire studies like Faravelli (2007) as well as from experiments like Konow (2000). An implication is that people are more supportive of redistribution, the greater the role of luck in producing economic outcomes. Of course, the relative importance of effort and luck is sometimes open to interpretation. Alesina and Angeletos (2005), for example, demonstrate how different beliefs across countries about the source of income differences can affect national tax policies, and Alesina et al. (2012) show how different beliefs can impact the economic growth of countries. In related work, Ooghe and Peichl (2015) analyse the design of optimal tax-benefit schemes, when earnings result from a combination of controlled and uncontrolled factors but the exact role of each cannot be perfectly observed.

The relevance of fairness extends beyond national redistributive policies. For example, Holm and Danielson (2005) find that the strength of distributive preferences as revealed in dictator experiments is predictive of trustworthiness (i.e., the willingness to reciprocate other's generosity) across such dissimilar countries as Sweden and Tanzania. Several experimental studies have demonstrated the importance for the optimal provision of public goods of precisely the three forces we focus on here: equality, equity and self-interest. In the study of Balafoutas, Kocher, Putterman and Sutter (2013), subjects trade off self-interest and fairness, whereby their choices of allocation schemes for group earnings reflect a greater acceptance of equalizing, when initial inequalities are arbitrary than when they are earned through task performance, echoing the luck vs. effort distinction cited above. Reuben and Riedl (2013) find equity and equality to be the two most salient rules for establishing cooperation, but high contributions to the public good are only sustained, when punishment is possible. Subjects in Noussair and Tan (2011) may choose whether to adopt a punishment regime, which as in Reuben and Riedl turns out to be conducive to cooperation, but often fail to choose the optimal regime. The authors give as a possible reason for this failure ambiguity about norms of equity or equality, which underscores the importance of the current project of identifying the factors that affect the weight assigned to each of these two

rules. Of course, the degree of inequality ultimately chosen by private or public policy-makers also has implications for efficiency. For example, Burdín (2015) shows how the degree of wage inequality chosen by firms has important implications for their ability to retain high-ability workers.

The results of our experiment are striking in terms of what does and does not matter for fairness preferences. In the literature, the relative preference for equity vs. equality is sometimes associated with the cultural distinction between collectivism vs. individualism (e.g., Kashima et al., 1988), nationality (e.g., Cappelen, Moene, Sørensen and Tungodden, 2013), and demographic variables such as race or gender (e.g., Croson and Gneezy, 2009). Most experimental evidence is based on the choices of *stakeholders*, or individuals with stakes in the decisions they are making. We find in our study, however, that *spectators*, or impartial third parties allocating rewards to others, display an exclusive preference for equity that is remarkably consistent across cultural, national and demographic boundaries. Such spectator preferences are potentially useful for various reasons. For example, Konow (2009) argues their relevance for evaluating and informing normative theories and economic policies, and Schram and Charness (2015) employ them as a source of advice aimed at influencing stakeholder behaviour. Here they also serve as a basis for comparison with stakeholder preferences. Relative to spectators, we find that stakeholders who share earnings anonymously shift significantly toward equalising earnings, and stakeholders shift further toward equality, when their decisions are non-anonymous. Indeed, non-anonymous stakeholders equalise completely, as the stakes approach zero. Ultimately, we conclude these results are most consistent with an impersonal (or impartial) preference for equity combined with a personal preference for equality that varies in strength monotonically with proximity (i.e., how personal the relationship is between individuals) and stakes.¹

A separate question concerns the strength of material self-interest relative to fairness preferences, whatever rules govern fairness preferences. In this study, average allocations to recipients do not, in many cases, differ significantly from those recipients' contributions to earnings based on their average task performance. This is consistent with List's (2007) finding that tasks, in comparison to windfall earnings, seemingly solidify property rights and reduce the

¹ Bohnet and Frey (1999a, 1999b) also find reduced self-interest, when subjects communicate and are non-anonymous, although they do not specifically study equity versus equality. Corgnet (2012) is closer in this regard, and his results are consistent with ours, despite numerous differences between our study and his in focus, subject matter (viz., peer evaluations and team performance) and design.

role of self-interest. Nevertheless, under certain conditions, stakeholders do take significantly more than they contribute, on average, and, in this respect, national or demographic differences sometimes emerge. For instance, individual anonymous stakeholders, who are big spenders outside the laboratory, take, on average, more than they contribute in both the US and Japan. In addition, anonymous stakeholders take, on average, more than they contribute, both in individual and in group dictator decisions, but only in the US, which mirrors the greater self-interest exhibited by US subjects in some other comparisons, e.g., see Rey-Biel, Sheremeta and Uler (2016). This study also contributes to research on groups (or teams) and finds that groups are more selfish than individuals, contrary to Cason and Mui (1997) but consistent with Luhan, Kocher and Sutter (2009), although we additionally find more selfish groups to be associated with more selfish individuals in the US and more equitable ones in Japan. Other variables seldom matter, including age, income, work hours, race, gender, culture and nationality.

The remainder of the article is organised as follows. Section 1 discusses factors that have been related to fairness preferences in the literature. Section 2 presents the experimental design and states hypotheses to be tested. Section 3 reports and analyses the results, and section 4 contains the discussion and conclusions.

1. Factors Related to Fairness Preferences

The design of the present experiment is informed by a rich but disperse literature related to fairness preferences. The focus of this study, which has been scarcely examined thus far, is on factors that potentially affect the equity-equality trade-off, that is, whether fairness preferences correspond to equity, equality or some combination of the two. To be clear, equality refers in this paper not to equal opportunities, equal rights or equal ratios, but rather to equal outcomes, i.e., strict egalitarianism. Equity, by contrast, refers here to rewards that are proportional to contributions to joint earnings. The discussion of this literature is broken down into four parts, which correspond to the top four (of the five) categories of variables that Camerer (2003) identifies as being important in social preference experiments. We order variables according to Camerer's taxonomy, although, several might arguably be categorised differently in the context of our experiment, as explained below.

1.1 Structural Variables

We begin with the category Camerer considers “the most useful to study,” viz., structural

variables, “because they connect simple games to richer economic structures ... and also provide the most direct clues to the psychology underlying social preference” (pg. 75). The structural variable that is central to the concept of equity is *entitlement*, or a sense of property rights, which in the laboratory is typically conveyed through subject participation in a task. Some experiments find proportionality of fair rewards to task performance, consistent with equity, e.g., Gächter and Riedl (2006), whereas others suggest a mix of equity and equality preferences, e.g., Cappelen, Hole, Sørensen and Tungodden (2007). These findings highlight a challenge to this research: whereas equity seems to be chosen simply because of a preference for it, one can think of various other explanations for why people might steer toward equality. For one, equality can occur as a *special case* of a more general principle that otherwise generates inequality. For instance, the accountability principle of justice (Konow, 2000) claims fair rewards are in proportion to the contributions people control, but if contributions under individual control do not differ or differ solely because of factors people cannot control, fair allocations reduce to equal shares. Another common reason for equality is the *ceteris paribus assumption*: when information about relevant differences is either unavailable or unreliable, people usually assume away any such differences and favour equality by default (see Konow, 2003).

1.2 Culture and Nationality

Economics experiments of possible cultural differences in social preferences have come to differing conclusions. The seminal paper of Roth et al. (1991) finds ultimatum game offers are higher in the US and Slovenia than in Japan and Israel, whereas Okada and Riedl (1999) discover no such differences between Austrian and Japanese subjects.² Buchan and Croson (2004) report differences in trust between US and Chinese subjects, whereas Brandts, Saijo and Schram (2004) find no significant differences in cooperation between subjects in the US, Japan, the Netherlands and Spain. Such studies raise questions not only about the type of social preferences potentially at work but also their strength. Cason, Saijo and Yamato (2002), for example, find that Japanese subjects are more inclined to punish low contributions in a public good game than are US subjects.³

² In the canonical ultimatum game, one subject proposes a division of a fixed sum with an anonymous counterpart, and the counterpart may accept, in which case the sum is divided as proposed, or reject, in which case both receive nothing.

³ Their study also indicates that US and Japanese subject pool effects are mostly due to national

Although this topic is typically described as one of “culture,” there are at least two reasons to differentiate culture and nationality. First, multiple countries might share a common culture (e.g., arguably North and South Korea), and multiple cultures might exist within a single country (e.g., Switzerland and the US). Second, culture and nationality can be seen as different possible social identities. Social identity refers to a sense of membership in a group, and that group might be defined in terms of national identity (US or Japan) or cultural identity (e.g., individualism or collectivism).⁴ To our knowledge, this study is unique by allowing examination of both cultural and national dimensions of the equity-equality trade-off. Although it is typically clear what nationality means, culture requires some further discussion.

Since Hofstede (1980), most cross-cultural research makes a distinction between individualism and collectivism, i.e., the degree to which people act as individuals or as members of a group. With regard to distributive justice, a frequent claim is that people in Western/individualistic countries prefer equity, whereas members of Eastern/collectivist countries prefer equality. This claim finds support in the results of some questionnaire studies, for example, see Kashima et al. (1988) and the meta-analysis of Sama and Papamarcos (2000). As a mostly collectivist society, Japan has traditionally experienced one of the lowest levels of income inequality in world, which Tachibanaki (2005) attributes to the strong “egalitarian principle prevalent among the Japanese” (pg.110).⁵ At the opposite extreme, the individualistic US has one of the highest levels of income inequality among developed countries, which Alesina and Angeletos (2005) trace, in part, to fairness views that tolerate higher inequality. On the other hand, the meta-analysis of Fischer and Smith (2003) suggests the need for a more complex account of culture and its relationship to distributive preferences. One oft cited proposal for a richer measure of culture is the two dimensional individualism-collectivism instrument developed by Singelis et al. (1995). In section 2, we discuss this measure in greater detail and its

differences rather than institutional differences: their experiment was conducted at two universities in the US and two in Japan, and they found significant between-country differences but comparatively minor within-country differences.

⁴ For an economic treatment of identity, see Akerlof and Kranton (2000). In the following subsection on demographic variables, we consider other traits that are often used to define social identity, e.g., race, gender, age and income.

⁵ Although inequality has increased substantially in Japan in recent decades, this does not necessarily reflect a change in values. Rather, Ohtake and Saito (1998) point out that the income distribution by age has remained relatively constant, and they attribute the increasing overall inequality to Japan’s rapidly aging population.

role in the present study.

Our design strategy for examining cultural effects also produces variation in additional variables, so we discuss the literature related to them here, even though they are actually structural variables. Dictator giving can depend on whether decisions are *individual* or *group*, and Cason and Mui (1997) show the sequence of both types of decisions can affect these choices in subtle ways. An inverse relationship between the level of subject *anonymity* and pro-social behaviour has been found in studies of social distance among both Western and Asian subjects, e.g., Hoffman, McCabe and Smith (1996) and Buchan and Croson (2004), respectively. In addition, pro-social behaviour often increases with *communication* among subjects. For example, Charness and Gneezy (2008) find dictators are more generous, when they know the family names of their counterparts. Both Western and Asian subjects are both more trusting and more trustworthy in Buchan, Johnson and Croson (2006), when communication is personal (about something related to their birthdays), but their behaviour is unaffected by impersonal communication. We see these findings as suggesting a unifying characteristic we will call *proximity*, which signifies how personal the relationship is between parties. Thus, relationships are more proximate, according to this concept, if people belong to a group, are non-anonymous, and may communicate, a point to which we will return in the interpretation of our own results.

1.3 Demographic Variables

Many experimental studies have examined the relationship between distributive preferences and demographic variables, so we also elicit information from subjects about gender, race, age and various economic measures. In their survey of gender differences in preferences, Croson and Gneezy (2009) report that the evidence on dictator giving is mixed, although women are usually more inequality averse than men. There are conflicting results on the interaction of dictator and recipient gender: women sometimes give more and sometimes less to other women. The evidence on race and social preferences is similarly mixed. For example, blacks are more generous in the ultimatum study of Eckel and Grossman (2001). On the other hand, the race of donor and recipient does not significantly affect average dictator giving to victims of Hurricane Katrina in Fong and Luttmer (2009), although giving is sensitive to donors' reported closeness to their own racial group. In a meta-analysis of dictator games, Engel (2011) finds a significant positive correlation between giving and age.

Finally, the evidence on giving and economic class is mixed. Studies of non-anonymous

charitable giving routinely find a positive relationship between income class and absolute giving (e.g., see the evidence cited in Andreoni, 1990). On the other hand, Piff et al. (2010) report an inverse correlation between economic class and anonymous generosity, measured both as dictator giving and as charitable donations. Bracha and Vesterlund (2013) hypothesise that giving can confer two types of status, economic and generosity, which makes the income-giving relationship ambiguous. Their results provide a means to reconcile the seemingly contradictory evidence and also underscore the importance of anonymity for the identification of intrinsically motivated generosity. Using a representative sample of children, Almås, Cappelen, Salvanes, Sørensen and Tungodden (2016) find spectators with low socio-economic class allocate more equally, whereas higher status dictators allocate more equitably.

1.4 Methodological Variables

A common question about social preference experiments is whether the departures from narrow self-interest they often reveal diminish, or even vanish, with larger stakes, such as those sometimes encountered outside the laboratory. Camerer (2003) reviews the results of ultimatum games with varying stakes, including ones up to several month's wages, and concludes there is comparatively little variation in offers and rejections. Using dictator and ultimatum games, Forsythe et al. (1994) report significant differences between zero stakes and positive stakes but find even very modest stakes produce the same behaviour as larger ones. In these studies, stakes can rightly be considered a methodological variable, since the question is one of salience and external validity (i.e., relevance to behaviour outside the laboratory). Although we keep with Camerer by listing stakes in this sub-section, we actually treat it as a structural variable that potentially affects fairness preferences themselves. We raise two distinct questions about stakes.

First, previous work shows that dictator allocations differ significantly depending on whether the decision maker is a *stakeholder* or a *spectator*, e.g., see the literature cited in Konow (2012). In the standard dictator game, the dictator is a stakeholder, whose anonymous decision affects his own payoff. In the spectator version of the dictator game, a third party chooses the allocation of a fixed sum between two other anonymous subjects, and the spectator is paid a fixed fee that is invariant with respect to his decision. Whereas spectators are presumed to choose impartially, stakeholders can, due to their material self-interest, be expected to allocate more, on average, to themselves than would spectators. The less obvious question, which we pose here, is whether the fact of having a personal stake in the decision at hand also affects the

equity-equality trade-off. That is, do impartial (and impersonal) spectators act on a different fairness rule from parties in a more personal relationship, like stakeholders? If so, this could have important implications for distribution, e.g., judges are ideally impartial third parties typically bound to the legal principle of proportionality, whereas co-workers can perhaps be seen attaching a greater weight to equality.

Second, focusing now on personal stakes, the research cited above finds little effect of the size of stakes on willingness to act on fairness preferences. But a separate question is whether the size of stakes affects what people consider fair, i.e., the equity-equality trade-off. According to Güth (1988), the early literature on justice in social psychology supports proportionality as the basic rule of distributive justice, but it also finds that small stakes are often associated with equality. We ask, therefore, whether higher personal stakes increase the relative importance of equity and believe ours in the first economics experiment to address this question. This issue is not confined to the laboratory, though, but mirrors issues of the appropriate distributive rule in the field. For example, friends and colleagues often “split the tab” in restaurants, when the bill is comparatively small, to avoid various costs, including goodwill, of a more exact reckoning.

2. Experiment and Hypotheses

2.1 Design and Hypotheses

There are two main phases to the experiment. In the production phase, twelve subjects in room X and twelve in room Y perform a task that generates earnings. Specifically, they prepare letters for mailing, and earnings are the product of the number of letters and a constant credit per letter that is common to all subjects and treatments. Usually, subjects differ considerably in their performance on this task and, therefore, in the earnings that can be attributed to them individually. Subjects are then matched into pairs, whereby the matching protocol takes advantage of variation in performance to maximise the productivity difference within each session. In a standard session, the most productive X subject is matched with the least productive Y subject, the second most productive X subject with the second least productive Y subject, etc. In the subsequent allocation phase, the earnings of matched subjects are pooled, and their joint earnings are allocated among them dictator style. The treatment differences all pertain to the allocation phase, specifically, with respect to the exact pooling of subject earnings and the identity of the dictators, which we now describe.

The design is constructed so as to minimise non-preference-based reasons for equality. Except where noted below, individual performance is common knowledge so as to avoid the aforementioned *ceteris paribus* rationale for equalising earnings. The matching protocol produces very few instances of actual equal productivity between members of a pair. In addition, the letter preparation task employed here has proven very effective in conveying entitlement in past research, e.g., Carpenter et al. (2010) and Falk and Ichino (2006). Its efficacy in the current experiment is reaffirmed by the observed allocation decisions and responses to a post-experimental questionnaire, which are reported later in the results section.

The experiment comprises three treatments. We now describe the first two treatments, in which all subjects are aware of other subjects and their roles but are anonymous, i.e., they do not know the identities of other subjects. In the **Spectator** treatment, there are twelve spectators, or third party subjects, located in a third room, called Z. Each Z subject is matched with a single X/Y pair. Spectators are informed of the number of letters individually prepared by X and Y and are paid a fixed fee, unrelated to their allocation decisions, for distributing the joint earnings generated by their X and Y counterparts between them. The **Anonymous Stakeholder** treatment is closer to the standard version of the dictator game. Subjects in rooms X and Y (again twelve each) first generate earnings and are then matched into pairs as in the Spectator treatment, but there is no third party Z. Instead, X subjects are arbitrarily chosen to allocate the earnings generated by their pair between themselves and their Y counterparts. Each X subject does this only for his or her pair. Thus, the only difference between the Anonymous Stakeholder and Spectator decisions is whether or not the dictator is also a party to the earnings being distributed. The labels and main features of these two treatments are summarised in the top two rubrics of Figure 1.

FIGURE 1. Experimental Design

Treatment	Decision	Dictator → Recipients	Anonymity
Spectator	Spectator	Z → X, Y	Anonymous
Anonymous Stakeholder	Anonymous Stakeholder	X → X, Y	Anonymous
Group Stakeholder	1. Group	Group X → Group X, Group Y	Anonymous
	2. Known Stakeholder	XA → XA, XB YA → YA, YB	Known

The Spectator treatment seeks to identify impartial distributive preferences, which are potentially useful for the various purposes listed in the introduction, viz., to evaluate or inform normative theory, policy, and stakeholders. The intent here is to utilise spectators to provide the clearest possible signal of impartial fairness rules, in light of the fact that stakeholders have been found to form biased beliefs about fairness, even their entitlements are equal (see Di Tella et al., 2015). Spectators in this experiment, by contrast, have no material or informational basis for distorting beliefs. It is also important to study the choices of stakeholders, however, since most situations in which distributive preferences are implicated involve parties with stakes in the outcome, e.g., workers, management, stockholders, resource owners, polluters, etc. Having both spectator and stakeholder decisions enables us to make several important comparisons. First, the strength of self-interest relative to fairness can be associated with different levels of giving between stakeholders and spectators. Second, the fairness rule of equity predicts that giving will vary in proportion to the entitlement, whereas equality rule predicts no such changes. So, any differences between spectator and stakeholder giving in response to changes in the entitlement will shed light on how each weights these two rules. Third, having both spectator and stakeholder decisions facilitates separate testing of possible national and cultural differences in the strength of fairness preferences and in fairness rules, a topic to which we now turn.

FIGURE 2. Nationality Hypothesis

	Spectator	Anonymous Stakeholder
Japan	= $\frac{1}{2}$	$\geq \frac{1}{2}$
United States	= α	$\geq \alpha$

Notes: These are amounts allocated to subject X. The second symbol in each cell represents the fairness rule, either equal splits ($\frac{1}{2}$) or proportionality (α). The first symbol is the standard mathematical operator, indicating allocations to X are either equal to (=) or greater than or equal to (\geq) amounts that correspond to the respective rule.

Regarding nationality, there are four reasons we chose the US and Japan for this study. First, a large volume of experimental economic research has been conducted in the US and Japan, both separately and in joint cross-cultural investigations. This fact facilitates connections between this study and others and, thereby, could help bolster claims of generality. Second, they are two of the three largest economies in the world and represent, therefore, a substantial fraction of world economic activity. Third, the US and Japan are often said to represent two sides of the most commonly cited cultural divide, viz., Eastern collectivism versus Western individualism.

Fourth, our chief interest is in preferences for equality versus inequality, and much cross-national research (e.g., see section 1.2) places these two countries at opposite poles on this issue. Building on this final point, the Nationality Hypothesis states that Japanese subjects value equality and that US subjects value equity, as summarised Figure 2. Specifically, Japanese spectators seek to set amounts equal to equal splits, denoted $= \frac{1}{2}$, whereas US spectators set allocations proportionately, denoted $= \alpha$. Anonymous stakeholders are motivated not only by fairness but also by material self-interest. Assuming the full range of possible weights on these two motives, they are predicted to allocate to themselves an amount greater than or equal to their respective fairness rule, either equality in Japan ($\geq \frac{1}{2}$) or proportionality in the US ($\geq \alpha$).

Although we call this the Nationality Hypothesis, if true, it could be an instance of the more general cultural claim outlined in section 1.2 that justice in collectivist societies corresponds to equality and in individualistic societies to equity. To examine this, the post-experimental questionnaire includes an individualism-collectivism (IC) measure.⁶ Specifically, we employ the IC measure of Singelis, Triandis, Bhawuk and Gelfand (1995), hereafter STBG, which comprises 32 items that respondents rate on a nine point scale. Although this construct is one of the most cited IC instruments, most cultural psychologists acknowledge that it has been notoriously difficult to develop satisfactory IC measures based on self-reports. These measures have proven especially vulnerable in terms of reliability, i.e., their ability to produce stable and consistent results over time and with different samples. An alternate approach is to activate cultural identity in the laboratory. To this end, we separately design an experimental treatment based on the theoretical framework of STBG but using behavioural rather than self-reported IC measures. An important reason for choosing the STBG framework, apart from its richer conceptualization and widespread usage, is that it is nicely adaptable to an economics experiment and, in particular, to our focus on equity and equality.

The theory behind the STBG construct involves two dimensions. Along one dimension, it distinguishes collectivism (C) as a cultural pattern in which people favour in-groups over out-groups from individualism (I), which makes no such distinctions, i.e., people are autonomous. An in-group (out-group) is a set of people with whom one shares (does not share) an identity, such as friends, family, team, nationality, culture, gender, race, etc. The second dimension

⁶ In addition, if the hypothesized behavioural relationship obtains, the IC measure could help avert a possible ecological fallacy, e.g., the inference from a relationship at the national level that collectivists favour equality, when individually they actually prefer equity.

distinguishes horizontal (H) relationships, which are based on equality, from vertical (V) ones, which are based on inequality. This produces four cultural variations: HC, VC, HI and VI.⁷ Among theories of culture, this one lends itself well to the current topic. Nevertheless, like other such theories, it is not formulated in terms of distributive justice, so we now add some flesh to it.

FIGURE 3. HVIC Hypothesis

		Group	Individual/ Known Stakeholder
HC	Japan	$> \frac{1}{2}$	$= \frac{1}{2}$
VC		$> \frac{1}{2}$	$= \infty$
HI		$= \frac{1}{2}$	$= \frac{1}{2}$
VI	US	$= \frac{1}{2}$	$= \infty$

Notes: These are amounts allocated to one's in-group (Group column) and to oneself (Individual/Known Stakeholder column), according to the four STBG-inspired cultural variations. Amounts are either greater than ($>$) or equal to ($=$) the equal split rule ($\frac{1}{2}$) or the proportionality rule (∞). In the Group Stakeholder treatment, Group corresponds to the Group decision and Individual to the Known Stakeholder decision.

Specifically, we take the IC dimension to refer to group preferences and collectivism to imply that in-groups consider it acceptable to have larger shares than out-groups. Individualism, on the other hand, implies no such distinctions so that in- and out-groups are treated equally. Further, we take the HV dimension to refer to allocations between individuals within in-groups with horizontal implying equal splits between individuals and vertical implying equitable (i.e., proportional) allocations between individuals. We call this interpretation of the STBG framework the “HVIC Hypothesis” and illustrate it in Figure 3. In Group allocations, collectivists prefer a larger share for their own group, denoted for HC and VC as $> \frac{1}{2}$, whereas individualists make no group distinctions and prefer equal allocations across groups, denoted for HI and VI as $= \frac{1}{2}$. For Individual allocations within groups, horizontal collectivists and individualists both prefer equality within their group, denoted for HC and HI as $= \frac{1}{2}$, whereas vertical collectivists and individualists prefer equity within their group, denoted for VC and VI as $= \infty$ (disregard the “Known Stakeholder” label for now). If we wish explicitly to factor in a self-interested bias, it is straightforward to adjust this table: we replace “=” with “ \geq ” and

⁷ For the self-report instrument, subjects respond to statements on a scale from 1 to 9, and each culture scale is formed by simple addition of these responses for its respective eight questions. The individual items can be found in the Appendix, whereby HI is formed from questions 1-8, VI from 9-16 (with 16 reverse scored), HC from 17-24, and VC from 25-32.

additionally require for Groups that HC and VC be strictly greater than HI and VI.⁸ According to STBG, the United States is VI, whereas Japan has a mixed pattern: more VC than anything else and overall more C than I, so we assign it to both HC and VC. As an alternative to self-reports, therefore, we formulate a test based on this assignment of countries to cultural patterns. Thus, for Individual, Japan is between equity and equality, and the HI cell is left empty in this study.

The HVIC Hypothesis posits cultural differences in distributive preferences based on distinctions between and within groups. We seek to activate those preferences in the laboratory by creating in-groups. For that purpose, we draw on a separate literature on induced group identity. Psychologists have conducted a large number of experiments employing a method called the “minimal group paradigm” (e.g., Tajfel and Turner, 1979), which has also been used in economics experiments (e.g., Chen and Li, 2009). Most of these studies reveal that subjects exhibit favouritism toward in-groups that are constructed on such trivial bases as art preferences, final digits of social security numbers, or even random assignment to colour-coded groups. Goette, Huffman and Meier (2012), however, find quantitative differences in social preferences between such “minimal groups,” who do not interact, and groups randomly assigned to real social interactions. Their subjects comprised Swiss officers in training, who had interacted all day over several weeks, and Goette et al. were able to maintain anonymity during their experiment. By contrast, our study requires a more diverse subject pool and permits only brief interaction. Therefore, we form groups without anonymity in order, *inter alia*, to strengthen group identity. There are several other benefits of this design choice, including greater external validity (social interaction is not usually anonymous) and the ability to examine possible effects of knowing the gender or race of counterparts. A potential source of noise, however, is if subjects know one another outside the laboratory – we sought to minimise this by assigning any subjects who showed up together or appeared to be acquainted to different rooms, where they would not be non-anonymously matched.

We tested the HVIC Hypothesis with the **Group Stakeholder** treatment, which is illustrated in the bottom of Figure 1 above. This treatment begins with the same production phase as the other treatments, but the allocation phase involves two stages and a different matching protocol (described momentarily). Instead of pairs, subjects are initially matched into quadruples

⁸ One might interpret the STBG theory differently from these two variations, of course, but the experiment requires the choice of a design and, by implication, an interpretation, and this version strikes us as the most reasonable and experimentally implementable one.

consisting of two X subjects, called XA and XB who form Group X, and two Y subjects, called YA and YB who form Group Y, and the earnings of all four subjects are pooled. The first allocation is the **Group** decision. XA and XB subjects are re-seated to meet face-to-face, are informed of the total production and earnings of their quadruple, and jointly choose how much to take for their in-group (Group X) and how much to give to the out-group (Group Y). YA and YB also meet face-to-face and are informed of what they receive from Group X. After five minutes, A and B subjects in both rooms return to their original seats. Although A and B subjects in both rooms meet with one other, X and Y groups never meet and remain anonymous to one another.

The second decision in this treatment is an individual one. Subject XA is arbitrarily chosen to allocate the Group X earnings they just selected for themselves between himself and his XB counterpart. Similarly, the YA subject is arbitrarily chosen to distribute the earnings Group X gave to them in the earlier decision between herself and her YB counterpart. These decisions are all made individually, but they are not anonymous: A and B subjects have met and know one another's identity. This **Known Stakeholder** decision is similar to the Anonymous Stakeholder decision in that the dictators are individual stakeholders with knowledge of individual production but differs in that they are known by and to the recipients. In terms of Figure 3, therefore, the Group decision corresponds to the predictions in the Group column and the Known Stakeholder decision to those in the Individual column.

The matching mechanism in the Group Stakeholder treatment is a bit more involved than in the other treatments. In each room, A and B subjects are separately matched so as to maximise productivity differences, i.e., the most productive A with the least productive B, etc., analogous to the subject X and Y pairings in the other treatments. Then these X groups (each consisting of an XA and XB) and Y groups (consisting of YA and YB) are matched to form quadruples, specifically, the most productive X group is matched with the most productive Y group, the second most productive X group with the second to most productive Y group, etc. This results in large average differences in productivity between A and B subjects but small productivity differences between X groups and Y groups.

For the Group decision, Group X is told only the total, but not individual or group, production and earnings of their quadruple. There are several reasons for this. The HVIC Hypothesis is not predicated on, or committed to, a rule of equity or equality. Instead, it simply asserts group favouritism to one's in-group among collectivists but not among individualists.

Without relevant information, previous research cited in section 1 indicates subjects typically make the *ceteris paribus* and assume equality applies. In fact, the matching protocol described above generates small productivity differences between X and Y Groups. At the same time, providing information only about total productivity likely helps create larger differences between Group X and Y pies, which is needed to study the effect of the size of stakes on the choice of fairness rule.⁹ In addition, the Group Stakeholder treatment allows comparison of the degree of self-interest by groups (or teams) versus individuals (e.g., as Cason and Mui, 1997) and makes possible analysis of nationality and of effects of groups on the choice of equity or equality.

2.2 Procedures

A total of 432 subjects participated in this experiment: 144 in the Spectator treatment, 96 in the Anonymous Stakeholder treatment and 192 in the Group Stakeholder treatment. Each of these totals consisted of equal numbers drawn from the undergraduate campuses of universities in Los Angeles, California and Osaka, Japan. These are comparably sized metropolitan areas, both the second largest in their respective countries. Subjects were invited by campus wide emails and flyers posted around campus to sign up at designated websites. Participants were recruited from different disciplines and screened to exclude non-citizens. All sessions had twelve subjects per room, and the Spectator treatment was conducted with three rooms (X, Y and Z), or 36 subjects total, per session, whereas the Anonymous Stakeholder and Group Stakeholder treatments each involved two rooms (X and Y), or 24 subjects total, per session. All subjects initially showed up at a single location to register and receive their show up fees in order to dispel doubts about the existence of counterparts in other rooms (see Frohlich, Oppenheimer and Moore, 2001, for evidence on the effects of such doubts). They were then randomly assigned to separate rooms except for adjustments to balance gender and to break up acquaintances.

Subjects are told that there are two phases of the experiment and then given more specific instructions for the first, or production, phase.¹⁰ Each letter correctly prepared in the six minutes

⁹ Specifically, there is little actual variation in the total stakes of dictator/recipient pairs in the other decisions of this experiment, but the self-interest of X groups in the Group decision represents a natural way to create variation in Group X and Y pies. This, in turn, allows us to study the effect of the size of stakes on the fairness rule, in this case, those acted on by A subjects in the subsequent Known Stakeholder decision. Moreover, providing information about group productivity might overly limit variance in these stakes given the previously cited research that known entitlements significantly reduce self-interest.

¹⁰ As in previous experiments of this kind, subjects were initially only informed in general terms about

allotted generates 100 points, which is also stated in local currency (i.e., US dollar or Japanese yen). After the task is complete and the letters counted, the pooling of earnings for their particular treatment is explained, the dictators are identified for the first time (although they are merely identified as subjects X or Z), and dictators are given five minutes to allocate points between subjects. For the Group Stakeholder treatment, X groups are first given five minutes to allocate the total earnings of the quadruple between themselves and the Y group.¹¹ Then, the Known Stakeholder allocations take place: the A subjects in each room are given five minutes to allocate the group X (or Y) totals between themselves and B subjects. All subjects then complete a questionnaire, which includes demographic questions, questions about distributive preferences and the STBG instrument. Finally, subjects are paid privately and permitted to leave. Altogether, sessions lasted, on average, about 50 minutes.

Show-up fees were \$5 in the US and 750 yen in Japan, and each letter in the US earned \$1 (1 point = 1 cent) and in Japan earned 150 yen (1 point = 1.5 yen). These parameters resulted in average total earnings of \$18.14 in the US and 2121 yen in Japan, approximately equal amounts in purchasing power parity using contemporaneous OECD conversion rates.¹² The instructions were written in English, translated into Japanese and then back-translated by a separate translator into English to check for consistency. The first author was present at both locations to verify that the recruitment, procedures, and even physical set-up were equivalent. For language reasons and in order not to arouse suspicion, the experiment was conducted solely by Americans in the US and Japanese in Japan, and the lead experimenter in the dictator rooms (except for the YA decisions) was always the same person (Konow in the US and Akai in Japan). The experimental protocol is contained in the Appendix.

3. Results and Analysis

The presentation and analysis of results follows the outline of section 1.

allocation procedures in order to avoid any effect on effort and productivity in the first phase that might subsequently impact allocations and confound inferences about distributive motives. The experiment was partially, but not completely, computerized for logistical reasons, viz., one of the labs did not have separate computerized rooms, but the use of pencil and paper for allocation decisions probably also helped reinforce that dictator decisions were anonymous to recipients. For practical reasons, though, decisions were not blind to the experimenter.

¹¹ The X groups are told that, if at the end of the five minutes they fail to agree, one of the X subjects will be randomly chosen to decide, although it never came to that.

¹² These earnings seemed sufficient: after receiving their payments, 99% of American subjects and 94% of Japanese subjects responded that they would be willing to participate in other economics experiments.

3.1 Structural Variables

We consider first summary statistics for all four decisions in the experiment. Table 1 summarises the mean allocations to X (or A, in the case of Known Stakeholders) as fractions of total earnings of pairs for the four decisions. The entitlement is the mean fraction of earnings produced by X or A, respectively. Below these are two-tail t-tests of differences between mean allocations and mean entitlements and between mean allocations and equal splits, respectively. We see Spectator allocations do not, on average, differ significantly from either equity (i.e., the mean entitlement, using paired t-tests) or equality, whereas Anonymous Stakeholder allocations to themselves significantly exceed both their mean entitlement and equality. We reserve detailed discussion of the Group Stakeholder treatment for the following section but note at this point that Known Stakeholders and Group Stakeholders take more than their respective entitlements and equality, although these differences vary in size and significance. These results are consistent with all groups being motivated by fairness and with the additional effect of material self-interest on stakeholders, but it does not tell us whether the governing fairness rule is equity and equality.

Table 1
SUMMARY OF MEAN RESULTS

	Spectator	Anonymous Stakeholder	Known Stakeholder	Group Stakeholder
Allocations				
Mean	0.45	0.57	0.54	0.59
(Std. Err.)	(0.036)	(0.029)	(0.015)	(0.023)
Entitlements				
Mean	0.45	0.49	0.52	0.46
(Std. Err.)	(0.033)	(0.028)	(0.019)	(0.006)
Difference mean allocation and mean entitlement				
t-statistic	-0.02	2.95	1.29	5.72
p-value	0.985	0.005	0.200	<0.001
Difference mean allocation and equality				
t-statistic	-1.42	2.31	3.06	4.04
p-value	0.161	0.025	0.002	<0.001
No. of obs.	48	48	91	48

Notes: The differences in means between allocations and entitlements employ paired t-tests. There are only 91 decisions by Known stakeholders (48 XA and 43 YA subjects), because five of the 48 X Groups allocated nothing to their Y Groups leaving no decisions for the corresponding five YA subjects.

Table 2 presents a simple but more disaggregated summary of the results. It categorises each decision into one of three types, viz., proportional, equal or selfish, based on a calculation of whether it is closest in absolute terms from its respective entitlement, equality or giving X (or A in the Known Stakeholder decision) the entire pie (ties are counted one-half to each type). The first column illustrates that 81% of Spectator decisions are closest to being proportional and 19% to being equal (the selfish category is not applicable here, since the dictators in this treatment are third parties). The percentage of proportional decisions falls to 57% and the percentage of equal ones rises to 30% for Anonymous Stakeholders, while 13% of decisions are closest to the completely selfish allocation. Further gains in equality and losses in equity are apparent for Known Stakeholders, while selfish allocations fall somewhat. Finally, we see that, although Group Stakeholders deviate, on average, significantly toward self-interest, as reported above, only 11% are closest to taking the entire earnings whereas 83% of their allocations are closer to equality. Only 6% are closest to being proportional, presumably by chance, since these dictators receive no information about relative production. Moreover, regression analysis shows that group entitlements do not significantly affect group allocations. As the remaining analysis in this sub-section concerns the entitlement, we therefore focus below on the three individual decisions.

Table 2
TYPE OF ALLOCATION BY DECISION
(percentage of each type)

Allocation Type	Dictator Decision			
	Spectator	Anonymous Stakeholder	Known Stakeholder	Group Stakeholder
Proportional	81	57	45	6
Equal	19	30	49	83
Selfish	NA	13	6	11

The dictator allocations of Z subjects in the Spectator treatment are illustrated in Figure 4a. The horizontal axis represents the fraction of letters produced by the X subject and the vertical axis the fraction of earnings allocated to the same X subject by the Spectator. If spectators value equality, the allocations should lie along a horizontal line at 0.5. Equity, on the other hand, calls for proportionality: fair allocations, or the *entitlement*, lie along the lighter 45 degree line where fractional allocations equal fractional contributions (ignore the dark lines for now). Apart from a few outliers, most decisions appear to be quite close to the entitlement.

Figure 4b presents the results of the Anonymous Stakeholder treatment. The points refer

again to the X subjects, but the fractional earnings on the vertical axis are those chosen by the X subjects to themselves (rather than those chosen by a third party). As with Spectators, a number of these allocations equal the entitlement, but departures from this line are more prominent. The Known Stakeholder treatment in Figure 4c illustrates the dictator allocations of A subjects in rooms X and Y to themselves, which appears to include a greater incidence of equality.

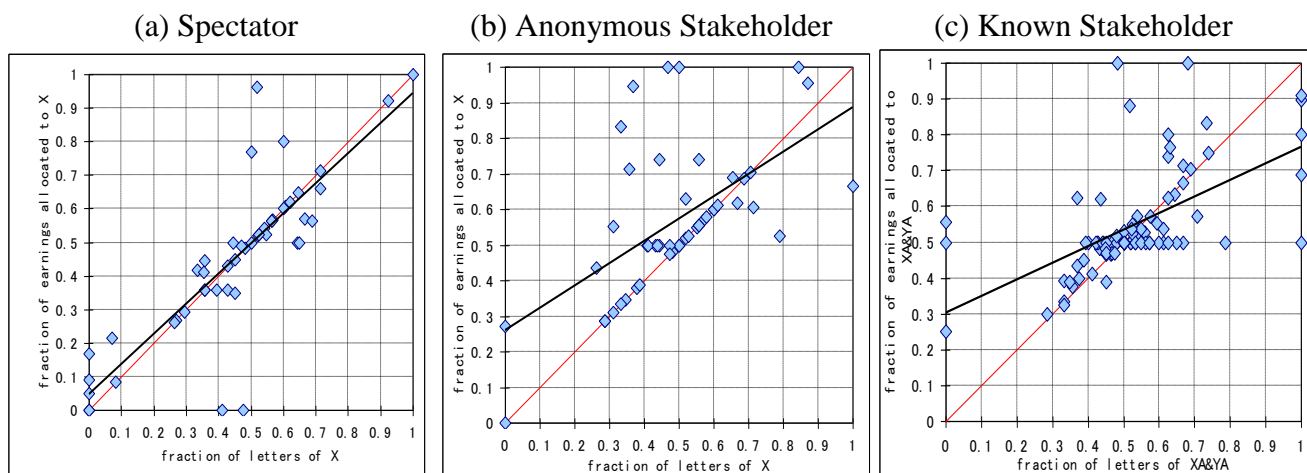


Figure 4. Dictator Allocations

These impressions are reinforced and further illuminated by regression analysis. The dark lines in Figure 4 result from the following OLS regression of fractional allocations on fractional entitlements for the three individual decisions:

$$(1) \quad \text{Allocation}_i = a + b \cdot \text{Entitlement}_i + \varepsilon_i$$

Equality corresponds to an intercept of one-half ($a=0.5$) and a slope of zero ($b=0$), whereas equity predicts an intercept of zero ($a=0$) and a slope of one ($b=1$). Since the dependent variable is left- and right-censored, however, we also run two-sided Tobit regressions for these and the other regressions reported in this paper.¹³ Table 3 reports these regressions and the results of F-tests of the joint hypotheses for the equity and equality cases. For the Spectator decisions, there is strong support for equity and no support for equality, confirming the impressions from Table 2 and Figure 4. Allocations in the two stakeholder decisions, however, fall between equity and equality and differ significantly from those two sets of predictions, as

¹³ For the findings reported in this paper, OLS and Tobit regressions result in conclusions that are qualitatively, and even quantitatively, very close. Nevertheless, it is worthwhile establishing the robustness of the results, given the focus of this study on preferences for equality: stakeholders who allocate in a more self-interested manner might result in disproportionate censoring of the allocations of more productive dictators and lower OLS slope coefficients, even if their fairness rule were equity. This is a problem of right censored data with OLS, which these Tobit regressions correct.

seen in Table 3. Comparing slope coefficients to those of Spectators, dictators equalise more as Anonymous Stakeholders (t-statistic=-2.12, $p < 0.05$) and even more as Known Stakeholders (t-statistic=-3.97, $p < 0.01$). Joint tests of the hypothesis of no change in intercepts and slopes similarly indicate significant differences between Spectator allocations and those of Anonymous Stakeholders (F-statistic=5.34, $p < 0.01$) and Known Stakeholders (F-statistic=10.55, $p < 0.01$). The highly significant slope coefficients in all three regressions demonstrate that the entitlement, and therefore equity, matters in every condition, although to differing degrees. On average, spectators allocate according to equity, whereas Anonymous and Known Stakeholders respond to but are less sensitive than spectators to differences in entitlement.

Table 3
TOBIT REGRESSION ANALYSIS

	Spectator	Anonymous Stakeholder	Known Stakeholder
Intercept	0.01 (0.049)	0.24*** (0.072)	0.30*** (0.037)
Entitlement	0.96*** (0.097)	0.67*** (0.138)	0.47*** (0.067)
F-statistics			
Equity (a=0, b=1)	0.11	7.61***	33.16***
Equality (a=0.5, b=0)	52.39***	15.67***	31.40***
Adjusted R^2	0.70	0.33	0.34
No. of obs.	48	48	91

Notes: Standard errors are in parentheses. Adjusted R^2 are from OLS. Significant at *10%, **5%, ***1% level.

We also examine whether dictator allocations are related to other distributive preferences than those activated by the entitlement. The post-experimental questionnaire includes five questions that elicit agreement on a four point Likert scale with statements about subject control over performance on the experimental task, basic needs, guaranteed income, and whether efficiency is promoted by minimizing differences in pay (equality) or by paying workers according to productivity (equity). Tobit regressions reported in Table A1 of the Appendix add the five responses to the right side of regression (1). They show that the entitlement remains highly significant and nearly identical in magnitude across the three treatments while none of the five questions is significant at conventional levels. Regarding control, 79% of subjects agreed or

strongly agreed that performance on the task was due to things they could control, thereby satisfying a more stringent criterion for entitlement, but the regression results suggest that even dissenters on this question accepted the experimental task as a fair basis for allocation.

3.2 Culture and Nationality

The Nationality Hypothesis predicts Japanese will allocate equally and Americans equitably with a possible self-interested bias in the case of Anonymous Stakeholders. Table 4 summarises the results of Table 1 broken down by country (minus the Known and Group Stakeholder decisions, which we present later). Consistent with the Nationality Hypothesis, there are no significant differences between mean Spectator allocations and entitlements in the US or between mean Spectator allocations and equal splits in the Japan. The results for Anonymous Stakeholders are also consistent the predictions, which involve weak inequalities: the mean US allocation significantly exceeds the entitlement, and the mean Japanese allocation exceeds equality, although not significantly so. These results are mostly inconclusive about the core claims of the hypothesis, though, so we turn now to regression analysis to test its stronger claims regarding equity and equality.

TABLE 4
MEAN RESULTS FOR SPECTATOR AND ANONYMOUS STAKEHOLDER
ALLOCATIONS BY COUNTRY

	Spectator		Anonymous Stakeholder	
	US	Japan	US	Japan
Allocations				
Mean	0.40	0.50	0.57	0.57
(Std. Err.)	(0.058)	(0.039)	(0.040)	(0.044)
Entitlements				
Mean	0.38	0.52	0.47	0.52
(Std. Err.)	(0.053)	(0.037)	(0.047)	(0.023)
Difference mean allocation and mean entitlement				
t-statistic	0.50	-0.718	3.00	1.29
p-value	0.622	0.479	0.006	0.208
Difference mean allocation and equality				
t-statistic	-1.77	0.04	1.70	1.55
p-value	0.090	0.967	0.103	0.134
No. of obs.	24	24	24	24

Notes: The differences in means between allocations and entitlements employ paired t-tests.

Table 5 summarises Tobit regressions that parallel Table 3 but are additionally broken down by country. The results are very close to those in Table 3: dictators in the US and Japan allocate similarly within treatments, and the allocations of both subject pools respond similarly to treatment differences. Spectators in both the US and Japan allocate equitably and not equally, according to F-tests. Anonymous Stakeholders in both countries equalise more, on average, departing from equity (in Japan, the F-test for Tobit is weakly significant with $p=0.078$ whereas OLS gives a $p=0.026$). We return to the Known Stakeholders later but note for now that we observe, compared to Anonymous Stakeholders, the same pattern from Table 3 of even greater equality and reduced equity in allocations in both countries. Thus, the evidence on the Nationality Hypothesis is mixed and mostly negative. Consistent with the hypothesis, US Spectators allocate equitably, and Stakeholders in both countries allocate to themselves no less than the fair amount. But, contrary to the hypothesis, Japanese Spectators also allocate equitably rather than equally. And Anonymous Stakeholders in both countries follow, on average, something between equity and equality, rather than equity in the US and equality in Japan.

TABLE 5
TOBIT REGRESSION RESULTS BY COUNTRY

	Spectator		Anonymous Stakeholder		Known Stakeholder	
	US	Japan	US	Japan	US	Japan
Intercept	-0.01 (0.070)	0.04 (0.072)	0.22* (0.116)	0.23** (0.099)	0.33*** (0.068)	0.27*** (0.040)
Entitlement	1.06*** (0.156)	0.88*** (0.132)	0.75*** (0.239)	0.66*** (0.175)	0.44*** (0.126)	0.49*** (0.071)
F-statistics						
Equity	0.09	0.71	5.27**	2.86*	12.33***	26.12***
Equality	27.32***	22.36***	7.07***	8.85***	10.85***	26.39***
Adjusted R^2	0.69	0.65	0.28	0.37	0.22	0.49
No. of obs.	24	24	24	24	44	47

Notes: Standard errors are in parentheses. Adjusted R^2 are from OLS. Significant at *10%, **5%, ***1% level.

In section 1 we noted the possibility of cultural variation that is orthogonal to nationality, so we included the STBG self-report instrument in the post-experimental questionnaire to try and capture such variation, as mentioned in section 2. Tobit regressions of allocations on the

entitlement and the four STBG scales controlling for demographic variables are reported on Table A2 of the Appendix. They reveal no significant effects of any of the scales on the allocations of Spectators or Anonymous Stakeholders.¹⁴ As previously mentioned, however, such measures are notoriously unreliable, which is one reason our primary focus is on the treatment we designed that uses behavioural measures, to which we now turn.¹⁵

TABLE 6
MEAN RESULTS FOR GROUP AND KNOWN STAKEHOLDER
ALLOCATIONS BY COUNTRY

	Group		Known Stakeholder	
	US	Japan	US	Japan
Allocations				
Mean	0.64	0.54	0.56	0.53
(Std. Err.)	(0.036)	(0.025)	(0.021)	(0.020)
Entitlements				
Mean	0.48	0.44	0.52	0.53
(Std. Err.)	(0.007)	(0.005)	(0.023)	(0.029)
Difference mean allocation and mean entitlement				
t-statistic	4.10	4.20	1.78	0.00
p-value	<0.001	<0.001	0.081	0.998
Difference mean allocation and equality				
t-statistic	3.93	1.72	2.75	1.57
p-value	<0.001	0.098	0.008	0.122
No. of obs.	24	24	44	47

Notes: The differences in means between allocations and entitlements employ paired t-tests.

According to the HVIC Hypothesis in Figure 3, average Group allocations should exceed equality in Japan but not the US. The results of Table 6 reveal the opposite finding: mean allocations in the US significantly exceed one-half, whereas the difference is not significant at conventional levels in Japan. If we adjust the hypothesis to add an equal measure of self-interest, then Japanese allocations should still exceed US ones, but the reverse is actually the case

¹⁴ Additional regressions explore effects on the choice of equity versus equality by adding interaction terms of the scales with the entitlement (for the rationale, see the discussion of equation (2) in section 3.3 below). These similarly reveal no effects of the scales that are significant at conventional levels, although introducing so many interaction terms produces multicollinearity that compromises the usefulness of such tests.

¹⁵ In addition, validity is in question here with the self-reports: contrary to expectations, mean scores on all scales are significantly higher for US than Japanese subjects except for the one scale (VI) on which the score should be higher but is actually insignificantly lower (see Table A3 in the Appendix).

according to a two-tail t-test ($t=2.27$, $p=0.027$).¹⁶ Note also there is no self-interested bias in Known Stakeholder allocations: mean allocations do not exceed mean entitlements at conventional levels of significance. Returning to Table 5 for regression analysis of the Known Stakeholders, we see these individual dictators allocate, on average, amounts between equity and equality. This is consistent with the HVIC Hypothesis for Japan, which is posited to have a mix of HC and VC, but not with the proportionality of VI posited for the US. Overall, then, the evidence from Group and Known Stakeholders is mostly inconsistent with the HVIC Hypothesis.

In addition to the cultural hypothesis for which it was primarily designed, the Group Stakeholder treatment is also related to studies in which subjects make both group and individual dictator allocations. For example, Cason and Mui (1997) find individuals might be slightly more selfish than groups (or “teams”), whereas Luhan, Kocher and Sutter (2009) report that groups are more selfish than individuals. Our results from Table 6 on mean Group and Known Stakeholder allocations are more consistent with the latter study, although the Group selfishness is only marginally significant for Japan. A Tobit regression of XA allocations on their entitlements and their previous Group X allocation to themselves show, in fact, that Group X selfishness only impacts individual selfishness in the US but not Japan (see Table A4 in the Appendix).

3.3 Demographic Variables

To examine whether allocations are related to demographic variables, we added the following regressors to equation (1): age, student expenditures during the school year, student earnings, parents’ annual income (in seven discrete categories), work hours per week, a gender dummy, and, for US subjects, dummy variables for Asian, black, Latino and Middle Eastern.¹⁷

¹⁶ One conjecture about the lower level of self-interest in Japan is that it is due to single-blind anonymity: Japanese subjects might be more inclined than US subjects to alter their decisions in order to present themselves more favorably to the experimenter. As mentioned previously, we did not see a way to conduct this experiment double blind, but any concern about this should, in any case, be allayed by a number of facts. First, the lead experimenter in the dictator room helped with registration, and whenever he recognized a subject, the subject was specifically assigned to a different room. Second, the lead Japanese experimenter was a graduate student who, in both countries, has lower social status than a professor, who was used in the US. Third, we know of no evidence that single blind procedures prompt any different response among Japanese subjects than among Western ones. For example, Okada and Riedl (1999) use the single blind method and find no significant difference, indeed, evidence elsewhere does not support any strong experimenter effect in general (e.g., Cason and Mui, 1997, and Bolton et al., 1998).

¹⁷ The questionnaire includes three variables that are not analyzed here, viz., college (e.g., Business, Liberal Arts) and major, since these are not comparable across institutions, as well as year in college due

We ran Tobit regressions separately for Spectator, Anonymous Stakeholder and Known Stakeholder decisions and for US and Japan resulting in six estimations, the results of which are reported in Table A5 of the Appendix. The entitlement continues to be positive and highly significant in every case, but almost nothing else is significant at conventional levels: age, parents' income, work hours and race are never significant. One significant finding has a plausible explanation: student expenditures are insignificant, except in the Anonymous Stakeholder decisions, where expenditures are directly related to the fraction taken in the US and Japan. This seems reasonable: "big spenders" take more for themselves when they are able to so do (i.e., are stakeholders) and can do so with impunity due to anonymity. Three more coefficients that are significant at the 5% level have no obvious explanation, but, out of the total of 45 demographic coefficients, this number is roughly what is to be expected by chance.

The Known Stakeholder decision offers the opportunity to explore whether dictators allocate differently based not just on their own race or gender but also on the race or gender of their recipients.¹⁸ We conducted two types of Tobit analyses, the results of which are presented on Table A6 in the Appendix. First, to examine possible in-group/out-group race biases, dummy variables are added to the right hand side of equation (1) for each such dictator/recipient pairing, e.g., Asian/Asian, Asian/non-Asian, etc. (whereby pairings that did not occur were dropped). The entitlement remains highly significant, but none of the race dummy variables is significant. Second, racial bias might be based not on the in-group/out-group distinction but rather on the race of the recipient, e.g., it could be that non-Asians as a group are less generous towards Asians. To test this, we add dummies to equation (1) for such dictator/recipient pairings as Asian/Asian, non-Asian/Asian, etc. (omitting pairings that did not occur). Again, the entitlement is highly significant, but none of the coefficients on the race dummies is significant.

We can also examine whether knowing the gender of one's recipient significantly impacts allocations in the Known Stakeholder decision. On average, men take 55% of the pie and women 54%, roughly equal shares. But both groups take somewhat more for themselves when matched with men (56% for both male and female dictators) than when matched with

to the high correlation with age. In a meta-analysis of dictator games, Engel (2011) reports that giving and age are significantly positively correlated, so we include it in our analysis for good measure, although an age effect here would be surprising given the age range in our dataset is much narrower than in Engel's.

¹⁸ Since the Japanese subjects were all Asian, the racially diverse pairings in the following analysis were entirely in the US sample. All of the following findings hold, though, for the pooled US/Japan sample.

women (53% for male dictators and 51% for female dictators). These are averages for the pooled sample, but we can analyse gender differences by nationality and controlling for entitlements.

TABLE 7
TOBIT REGRESSIONS FOR KNOWN STAKEHOLDER ON GENDER

Indep. Var.	NATIONALITY OF DICTATOR		
	US	Japan	Pooled US/Japan
Intercept	0.50*** (0.10)	0.27*** (0.04)	0.31*** (0.04)
Entitlement	0.37*** (0.12)	0.51*** (0.07)	0.46*** (0.07)
Male with female	-0.14* (0.07)	0.01 (0.04)	-0.01 (0.03)
Female with female	-0.17** (0.07)	-0.03 (0.09)	-0.03 (0.03)
Female with male	-0.11 (0.07)	-0.05 (0.03)	-0.02 (0.03)
Adjusted R^2	0.24	0.49	0.33
No. of obs.	44	47	91

Notes: The omitted category is male dictator matched with male recipient.
Significant at *10%, **5%, ***1%.

Table 7 reports the results of Tobit regressions of A subject (i.e., XA and YA) allocations on the entitlement and dummies for three dictator/recipient pairings: male/female, female/female and female/male, where male/male is the omitted category. The estimated intercept and entitlement slope coefficients and their significance are consistent with previous estimates of Known Stakeholder allocations, indicating as before a mixture of equality and equity. Interestingly, gender does not matter for Japanese dictators or in the pooled sample. American dictators of both genders, however, take less when paired with female counterparts, although this is only marginally significant for male dictators. In the US, women matched with women take 17 percentage points less (relative to men matched with men). This pattern is consistent with the greater generosity of women toward women in Dufwenberg and Muren (2006) but is opposite the lesser female/female generosity in Ben-Ner, Kong and Putterman (2004). The absence of a gender effect in Japan might be related to the fact that Japanese Known Stakeholders, in contrast to their US counterparts, take, on average, no more than the entitlement leaving no room for them to be even fairer to women.

Interacting the entitlement with various demographic variables tends to render results insignificant given the resulting multicollinearity and reduced degrees of freedom. But where hypotheses or prior results suggest an effect on the equity-equality trade-off, we estimate OLS and Tobit versions of the following regression that include the “Variable” in question:

$$(2) \quad \text{Allocation}_i = a + b \cdot \text{Entitlement}_i + c \cdot \text{Variable}_i + d \cdot \text{Entitlement}_i \cdot \text{Variable}_i + \varepsilon_i$$

If, for example, equality is positively related to the Variable, the coefficient on c should be negative and the coefficient on d positive: as Variable increases, dictators increasingly depart from equality and approach proportionality. The few significant results are limited to the Known Stakeholder decision (see Table A7 of the Appendix). One out of the eight possible gender pairing/country combinations for this decision is significant: US male dictators equalise more when the recipient is female. Also, contrary to Almås et al. (2016), low socio-economic status subjects do not equalise more, in fact, Known Stakeholders equalise significantly less, perhaps related to our different measures of socio-economic status (we use parents’ income).

3.4 Methodological Variables

As previously discussed, one reason sometimes given for equality is that people forgo proportional accounting when the stakes are not very large, in particular, when decisions are not anonymous. The Known Stakeholder decision offers an opportunity to test this by estimating equation (2) using Stakes as the Variable.¹⁹ We focus on the Known Stakeholder results, since only this case fits the story involving non-anonymous decisions, and since it is the only decision in this experiment with sufficiently large variance in stakes to test meaningfully its effect.²⁰

The Tobit regression results are presented in Table 8 and confirm all predictions of the hypothesis: larger Stakes significantly decrease the intercept, with an estimated coefficient of -0.252 , and significantly increase the slope, with a parameter estimate on the interaction term of 0.556 . Thus, larger stakes are associated with significantly more proportional allocations, or, put

¹⁹ To ease interpretation, the Stakes variable was created as follows: the total points available to each X/Y or A/B pair, respectively, are divided by the average total points across all pairs in the Spectator, Anonymous Stakeholder and Known Stakeholder decisions. Thus, the average stakes across these decisions equal 1, while the allocation and entitlement continue to be measured as fractions of the individual stakes.

²⁰ The variance of standardized stakes in the Spectator and Anonymous Stakeholder decisions are both 0.06, whereas it is more than four times greater at 0.27 in the Known Stakeholder decision, significantly larger than the former two.

differently, dictators allocate more equally with smaller stakes.²¹ Indeed, this regression provides the strongest evidence of equality: controlling for the size of stakes, allocations in this treatment do not differ significantly from an intercept of 0.5 and a slope coefficient of 0 on the Entitlement.

TABLE 8
TOBIT REGRESSION ANALYSIS OF EFFECT OF
STAKES ON KNOWN STAKEHOLDER ALLOCATIONS

Variable	Parameter estimate (Std. Err.)
Intercept	0.511*** (0.103)
Entitlement	-0.023 (0.180)
Stakes	-0.252** (0.111)
Entitlement \times Stakes	0.556*** (0.196)
Adjusted R^2	0.41
Number of observations	91

Notes: Significant at *10%, **5%, ***1%.

An alternate explanation for this finding is that stakes are correlated with an omitted variable that causes more equal allocations. Specifically, suppose whether or not one was previously in a position of power affects subsequent equality preferences. That is, YA dictators might equalise more, on average, not because of the smaller stakes but because of sympathy or solidarity with YB dictators who were similarly powerless in the first round. We add a dummy variable for YA Known Stakeholders and an interaction term with the entitlement to equation (2) to test this conjecture. Results reported on Table A8 in the Appendix show these terms are not significant, but the estimates of the other variables in equation (2) are almost unchanged in magnitude and significance. Thus, it seems the size of stakes per se drives these results.

4. Discussion and Conclusions

The results of this study strongly support the empirical relevance of two fairness rules, equity and equality. Specifically, test after test shows that, if the entitlement is known, dictator

²¹ The results remain qualitatively the same, if we run this regression using OLS or on the US and Japanese sub-samples: the estimates of a and d are significantly positive, c significantly negative and b insignificant.

allocations are significantly related to it, indicating the importance of equity. The relevance of equality varies from not at all to very much depending on structural variables that implicitly determine the relative weights on the two rules. But we believe the results of this experiment are interesting, not only for the importance of structural variables for this equity-equality trade-off, but also for the large number of non-structural variables that are not important.

We stated and tested possible relationships of fairness rules to nationality and culture in three different ways. First, the hypothesis that fairness corresponds to equity in the US and to equality in Japan is refuted by evidence that both groups value both rules. In fact, subjects in both countries shift their weights on the rules in almost identical ways across the changing circumstances of the three individual decisions. Second, the richer STGB approach posits two cultural dimensions based on the importance of in-groups/out-groups and equality/inequality, but we find no significant effects of their four self-reported scales on allocation decisions. Third, the Group Stakeholder treatment was designed as a behavioural test of a version of the STGB framework applied to distributive justice by activating group identities, but most of the results contradict fundamental predictions of that framework. There are scattered cases of differences in the trade-off between self-interest and fairness, e.g., US stakeholders often act more on their self-interest than Japanese ones. But we find no significant national or cultural differences in the essence of what people consider fair, specifically, in the equity-equality trade-off.

In multi-variate regression analysis, demographic variables are rarely significant, while the entitlement is always directly and significantly related to allocations. One plausible effect here is that US and Japanese “big spenders” act more selfishly, when they have a stake in the allocation and are anonymous. But this is arguably as much a structural as demographic or cultural effect, especially since it is found in both the US and Japan. Known Stakeholder allocations do not depend on the race of the dictator or recipient, but we find isolated gender effects: when the recipient is female, female dictators take less, and male dictators equalise more, although in both cases only among US subjects. Out of the many possible effects of demographic variables we consider, few are significant, and for most of these few, it is difficult to mount a strong claim that they are more than statistical flukes.

Finally, stakes can be treated as a methodological variable in some contexts, but here we consider stakes as a structural variable that might affect fairness preferences themselves. We find, first, that Spectators allocate according to equity and not equality in their positions as

impersonal third parties. On the other hand, stakeholders, both anonymous and known, act on a combination of equity and equality. Second, the equity-equality trade-off depends on the size of stakes in the Known Stakeholder decision. At zero stakes, these dictators equalise completely, but, as the stakes rise, they shift significantly toward proportional allocations, indicating an increasing weight placed on equity.

In sum, we find effects on fairness preferences of structural variables, including entitlement, anonymity, stake-holding, and the size of stakes, which are robust across a wide range of non-structural variables that almost never matter, including nationality, culture, age, race, gender, and various measures of income and work. What might account for this pattern of effects and non-effects? We end by suggesting an answer to that question and by discussing some implications of our conclusions for economic theory and policy.

Consider first the pattern of differences in the equity-equality trade-off across the three individual decisions. Impartial and impersonal Spectators exhibit a preference for equity but none for equality. Anonymous Stakeholders are otherwise the same and differ only in that they share earnings as one member of the two person group, i.e., their relationship in the decision is *personal* rather than impersonal. Known Stakeholders are similar to Anonymous Stakeholders except that they are known to and by and communicate with the other member of their group, making their relationship even more personal. In section 1.2, we introduced a term for the unifying characteristic that varies across these decisions: *proximity* signifies how personal the relationship is between parties. Proximity increases progressively from the Spectator to the Anonymous Stakeholder to the Known Stakeholder decisions as does the importance of equality in fairness preferences. Thus, a reasonable conclusion is that fairness corresponds to equity in impersonal relationships and combines equity and equality in personal ones, whereby the weight on equality increases with proximity. Finally, the results on stakes in the Known Stakeholder decision suggest that, when the relationship is personal, fairness preferences shift progressively from equal splits to a rule with increasing weight on equity as the size of stakes rises.

This interpretation accounts for the main effects on fairness preferences through the operation of the structural variables, and their robustness suggests common fairness preferences. Almost without exception, the significant effects of non-structural variables on behaviour are not due to any effect on fairness rules but rather to the effect of such variables on the weight placed on self-interest versus fairness. We believe this interpretation can also reconcile other findings on

social preferences. For example, the difference between spectator equity and the stakeholder shift toward equality is also observed in Gächter and Riedl (2006) and Konow (2000). And many studies have found considerable individual heterogeneity in weights placed on self-interest versus fairness, e.g., Fehr and Schmidt (1999), and on competing rules of fairness, e.g., Cappelen, Hole, Sørensen and Tungodden (2007) and Charness and Rabin (2002). Regarding national differences, a greater general tendency for Japanese to comply with moral rules relative to Americans could explain both our results and the fact that the former punish low contributions to public goods more vigorously, e.g., Cason, Saijo and Yamato (2002). Indeed, such differences in the relative salience of multiple moral rules or in the willingness to act on them might well explain a wide range of differences in international bargaining experiments, e.g., Henrich, et al. (2001) and Kocher et al. (2008).

Thus, both the current study and previous ones can be seen as pointing toward common moral rules that relate strongly to structural variables, which determine the weight attached to the various rules and self-interest. If found to be robust, this conclusion has many implications for theory and policy. It augers well for efforts to construct stronger positive theories of social preferences. In addition, many philosophical schools (including but not limited to ethical naturalism) consider such empirical moral knowledge relevant to normative theory. Here the impartial judgments of our spectators offer possible raw materials for prescriptive theory, which, in turn, supplies a normative foundation for policy. Policy advice, however, also requires an understanding of the effects of moral rules in a world populated by stakeholders, whose motives are partially moral at best. And here the sustained importance of structural variables among our stakeholders is a favourable indication of information that can inform private and public policies.

These findings might provide lessons for understanding behaviour and guiding policy in a variety of contexts, such as the following. The wage structure of firms might partly reflect a tension between management's goals, perhaps more aligned with efficiency and equity, and a preference by labour for greater equality. The relative importance of equity versus equality could depend on how personal worker relations are and on the size of the stakes involved. Perhaps partners treat one another more equally than they would themselves be treated by judges and juries. A person might favour more equitable redistribution policies as a voter, whose negligible expected stake in the outcome reduces him almost to a spectator, but treat a friend, family member or co-worker more equally. Perceptions of equity and equality affect and are affected by

trade and international environmental treaties based on various factors (e.g., Lange et al., 2010). And the US-European differences in redistributive policies, which Alesina and Angeletos (2005) identify, can be seen as a difference about a matter of fact (viz., the actual importance of responsibility in determining allocations) rather than a fundamental difference in support for equity or equality.

As Blanco, Engelmann and Normann (2011) point out, a fairness concept does not necessarily predict individual behaviour well across different decisions, even if it rationalises data well at the aggregate level. Thus, future research should examine the robustness of our findings on the equity-equality trade-off to the kinds of contexts listed above and to different types of decisions. Indeed, building on the results of the current study, Konow, Johannsen-Stenman, Martinsson and Medhin (2016) design a natural field experiment, the main results of which indicate that being paid in accordance with different rules can alter the fairness preferences of workers, affecting the relative weights on equity and equality.

Finally, the difference identified here between spectator equity and importance of equality among stakeholders could be a part of a more general distinction between two types of moral preferences: *morals* and *mores*. As we use the terms, morals refer to the moral preferences of an impartial or impersonal party, and we call their rules *moral principles*. In the context of this experiment, equity is a moral principle. Mores, by contrast, refer to the moral preferences that are distinct to personal relationships, and we call their rules *moral norms*. In our study, equality is a moral norm. This choice of terminology reflects our attempt to stay close to common usage (although, of course, these terms have often been used interchangeably in the social preferences literature). Whereas morals connote general and impartial views of right and wrong, mores are often defined as the “morally binding customs of a particular group,” which implies a certain specificity to social context and possible ephemerality. Thus, moral principles could be common and enduring, whereas moral norms vary according to the context and adjust over time. Future tests of this distinction might go beyond the current context of distributive justice and examine, for example, social dilemmas: although individuals likely share a common desire, *ceteris paribus*, for efficient outcomes, many personal factors affect actual cooperation norms, including communication, strategy set, order of play, and the history of cooperation.

REFERENCES

- Akerlof, George, and Kranton, Rachel (2000). "Economics and Identity," *Quarterly Journal of Economics* 115(3), 715-753.
- Alesina, Alberto, and Angeletos, George-Marios (2005). "Fairness and Redistribution," *The American Economic Review* 95(4), 960-980.
- Alesina, Alberto, Cozzi, Guido, and Mantovan, Noemi (2012). "The Evolution of Ideology, Fairness and Redistribution," *The Economic Journal* 122(565), 1244-1261.
- Almås, Ingvild, Cappelen, Alexander, Salvanes, Kjell G., Sørensen, Erik, and Tungodden, Bertil (2016). "Willingness to Compete: Family Matters," *Management Science* 62 (8), 2149-2162.
- Andreoni, James (1990). "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving", *The Economic Journal* 100(401), 464-477.
- Balafoutas, Loukas, Kocher, Martin, Putterman, Louis, and Sutter, Matthias (2013). "Equality, Equity, and Incentives: An Experiment," *European Economic Review* 60 (May), 32-51.
- Ben-Ner, Avner, Kong, Fanmin, and Putterman, Louis (2004). "Share and Share Alike? Gender-Pairing, Personality, and Cognitive Ability as Determinants of Giving," *Journal of Economic Psychology* 25(5), 581-589.
- Blanco, Mariana, Engelmann, Dirk, and Normann, Hans Theo (2011). "A Within-subject Analysis of Other-regarding Preferences," *Games and Economic Behavior* 72 (2), 321-338.
- Bohnet, Iris, and Frey, Bruno S. (1999a). "Social Distance and Other-regarding Behavior in Dictator Games: Comment," *The American Economic Review* 89(1), 335-339.
- Bohnet, Iris, and Frey, Bruno S. (1999b). "The Sound of Silence in Prisoner's Dilemma and Dictator Games," *Journal of Economic Behavior and Organization* 38(1), 43-57.
- Bolton, Gary, Katok, Elena, and Zwick, Rami (1998). "Dictator Game Giving: Rules of Fairness versus Acts of Kindness," *International Journal of Game Theory* 27(2), 269-299.
- Bracha, Anat and Vesterlund, Lise (2013). "How Low Can You Go? Charity Reporting When Donations Signal Income and Generosity," Working Papers No.13-11.
- Brandts, Jordi, Saijo, Tatsuyoshi, and Schram, Arthur (2004) "How universal is behavior? A four country comparison of spite and cooperation in voluntary contribution mechanisms," *Public Choice* 119 (3-4), 381-424.
- Buchan, Nancy, and Croson, Rachel (2004). "The Boundaries of Trust: Own and Others' Actions in the US and China," *Journal of Economic Behavior and Organization* 55(4), 485-504.

- Buchan, Nancy, Johnson, Eric, and Croson, Rachel (2006). "Let's get personal: An International Examination of the Influence of Communication, Culture and Social Distance on other Regarding Preferences," *Journal of Economic Behavior & Organization* 60(3), 373-398.
- Burdín, Gabriel (2015). "Equality Under Threat by the Talented: Evidence from Worker-Managed Firms," *The Economic Journal* 126(594), 1372-1403.
- Camerer, Colin (2003). *Behavioral Game Theory: Experiments in Strategic Interaction*, Princeton: Princeton University Press.
- Cappelen, Alexander, Hole, Astri, Sørensen, Erik, and Tungodden, Bertil (2007). "The pluralism of fairness ideals: An experimental approach," *American Economic Review* 97 (3), 818-827.
- Cappelen, Alexander, Moene, Karl Ove, Sørensen, Erik, and Tungodden, Bertil (2013). "Needs Versus Entitlements – An International Fairness Experiment," *Journal of the European Economic Association* 11(3), 574-598.
- Cappelen, Alexander, Sørensen, Erik, and Tungodden, Bertil (2010). "Responsibility for what? Fairness and individual responsibility," *European Economic Review* 54(3), 429-441.
- Carpenter, Jeffrey, Matthews, Peter, and Schirm (2010). "Tournaments and Office Politics: Evidence from a Real Effort Experiment," *American Economic Review* 100(1), 504-517.
- Cason, Timothy, and Mui, Vai-Lam (1997). "A Laboratory Study of Group Polarization in the Team Dictator Game," *The Economic Journal* 107(444), 1465-1483.
- Cason, Timothy, Saijo, Tatsuyoshi, and Yamato, Takehiko (2002). "Voluntary Participation and Spite in Public Good Provision Experiments: An International Comparison," *Experimental Economics* 5(2), 133-153.
- Charness, Gary, and Gneezy, Uri (2008). "What's in a Name? Anonymity and Social Distance in Dictator and Ultimatum Games," *Journal of Economic Behavior and Organization* 68(1), 29-35.
- Charness, Gary, and Rabin, Matthew (2002). "Understanding Social Preferences with Simple Tests." *Quarterly Journal of Economics* 117(3), 817-869.
- Chen, Yan and Li, Sherry (2009). "Group Identity and Social Preferences," *American Economic Review* 99(1), 431-57.
- Cherry, Todd L., Kroll, Stephan, and Shogren, Jason F. (2005). "The Impact of Endowment Heterogeneity and Origin on Public Good Contributions: Evidence from the Lab," *Journal of Economic Behavior and Organization* 57(3), 357-365.
- Corngnet, Brice (2012). "Peer Evaluations and Team Performance: When Friends Do Worse than Strangers," *Economic Inquiry* 50(1), 171-181.

- Crawford, Vincent, Gneezy, Uri, and Rottenstreich, Yuval, (2008). "The Power of Focal Points Is Limited: Minute Payoff Asymmetry May Yield Large Coordination Failures," *American Economic Review* 98(4), 1443-1458.
- Croson, Rachel, and Konow, James (2009). "Social Preferences and Moral Biases," *Journal of Economic Behavior and Organization* 69(3), 201-212.
- Croson, Rachel, and Gneezy, Uri (2009). "Gender Differences in Preferences," *Journal of Economic Literature* 47(2), 448-474.
- Dufwenberg, Martin, and Muren, Astri (2006). "Generosity, Anonymity, Gender," *Journal of Economic Behavior and Organization* 61(1), 42-49.
- Di Tella, Rafael, Perez-Truglia, Babino, Andres, and Sigman, Mariano (2015). "Conveniently Upset: Avoiding Altruism by Distorting Beliefs about Others' Altruism," *American Economic Review* 105(11), 3416-3442.
- Eckel, Catherine, and Grossman, Philip (2001). "Chivalry and Solidarity in Ultimatum Games," *Economic Inquiry* 39(2), 171-188.
- Ellingsen, Tore, and Johannesson, Magnus (2008). "Anticipated Verbal Feedback Induces Altruistic Behavior," *Evolution and Human Behavior* 29(2), 100-105.
- Engel, Christoph (2011). "Dictator Games: A Meta Study," *Experimental Economics* 14(4), 583-610.
- Falk, Armin and Ichino, Andrea (2006). "Clean Evidence on Peer Effects," *Journal of Labor Economics* 24(1), 39-57.
- Faravelli, Marco (2007). "How Context Matters: A Survey Based Experiment on Distributive Justice," *Journal of Public Economics* 91(7-8), 1399-1422.
- Fehr, Ernst and Fischbacher, Urs, (2004). "Third Party Punishment and Social Norms," *Evolution and Human Behavior* 25(2), 63-87.
- Fehr, Ernst, and Schmidt, Klaus M. (1999). "A Theory of Fairness, Competition and Cooperation." *Quarterly Journal of Economics* 114(3), 817-868.
- Fischer, Ronald and Smith, Peter (2003). "Reward Allocation and Culture a Meta-Analysis," *Journal of Cross-Cultural Psychology* 34(3), 251-268.
- Fong, Christina, and Luttmer, Erzo (2009). "What Determines Giving to Hurricane Katrina Victims? Experimental Evidence on Racial Group Loyalty," *American Economic Journal: Applied Economics* 1(2), 64-87.

- Forsythe, Robert, Horowitz, Joel, Savin, Nathan and Sefton Martin (1994). "Fairness in Simple Bargaining Experiments," *Games and Economic Behavior* 6(3), 347-369.
- Frank, Robert (2004). *What Price the Moral High Ground?* Princeton and Oxford: Princeton University Press.
- Frohlich, Norman, Oppenheimer, Joe, and Moore, Bernard (2001). "Some doubts about measuring self-interest using dictator games: the cost of anonymity," *Journal of Economic Behavior and Organization* 46(3), 271-290.
- Gächter, Simon, and Riedl, Arno (2005). "Moral Property Rights in Bargaining with Infeasible Claims," *Management Science* 51(2), 249-263.
- Gächter, Simon, and Riedl, Arno (2006). "Dividing Justly in Bargaining Problems," *Social Choice and Welfare* 27(3), 571-594.
- Goette, Lorenz, Huffman David, and Meirer, Stephan (2012). "The Impact of Social Ties on Group Interactions: Evidence from Minimal Groups and Randomly Assigned Real Groups," *American Economic Journal: Microeconomics* 4(1), 101-115.
- Greenberg, Jerald (2001). "Studying Organizational Justice Cross-Culturally: Fundamental Challenges," *The International Journal of Conflict Management* 12(4), 365-375.
- Güth, Werner (1988). "On the Behavioral Approach to Distributive Justice: A Theoretical and Experimental Investigation." In *Aspects of Distributive Justice*, edited by Shlomo Maital. New York: New York University Press.
- Henrich, Joseph, Boyd, Robert, Bowles, Samuel, Camerer, Colin, Fehr, Ernst, Gintis, Herbert, and McElreath, Richard (2001). "In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies," *American Economic Review* 91(2), 73-78.
- Hoffman, Elizabeth, McCabe, Kevin, and Smith, Vernon (1996). "Social Distance and Other-Regarding Behavior in Dictator Games," *American Economic Review* 86(3), 653-660.
- Hofstede, Geert (1980). *Culture's Consequences*. Beverly Hills: Sage Publications.
- Holm, Håkan, and Danielson, Anders (2005). "Tropic Trust versus Nordic Trust: Experimental Evidence from Tanzania and Sweden," *The Economic Journal*, 115(5), 505-532.
- Kashima, Yoshihisa, Siegel, Michael, Tanaka, Kenichiro, and Isaka, Hiroko (1988). "Universalism in Lay Conceptions of Distributive Justice: A Cross-Cultural Examination," *International Journal of Psychology* 23, 51-64.
- Kocher, Martin G., Cherry, Todd L., Kroll, Stephan, Netzer, Robert J., and Sutter, Matthias (2008). "Conditional Cooperation on Three Continents," *Economics Letters* 101(3), 175-178.

- Konow, James (2012). "Adam Smith and the Modern Science of Ethics," *Economics and Philosophy* 28(3), 333-362.
- Konow, James (2000). "Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions," *American Economic Review* 90(4), 1072-92.
- Konow, James (2009). "Is Fairness in the Eye of the Beholder? An Impartial Spectator Analysis of Justice," *Social Choice Welfare* 33(1), 101-127.
- Konow, James (2003). "Which is the Fairest One of All?: A Positive Analysis of Justice Theories," *Journal of Economic Literature*, 41(4), 1186-1237.
- Konow, James, Johansson-Stenman, Olof, Martinsson, Peter, and Medhin, Haileselassie (2016). "The Just World Hypothesis: Theory and a Natural Field Experiment," work-in-progress.
- Lange, Andreas, Loschel, Andreas, Vogt, Carsten, and Ziegler, Andreas (2010). "On the Self-interested Use of Equity in International Climate Negotiations." *European Economic Review* 54(3), 359-375.
- List, John A. (2007). "On the Interpretation of Giving in Dictator Games," *Journal of Political Economy* 115(3), 482-493.
- Luhan, Wolfgang, Kocher, Martin, and Sutter, Matthias (2009). "Group Polarization in the Team Dictator Game Reconsidered," *Experimental Economics* 12(1), 26-41.
- Noussair, Charles, and Tan, Fangfang (2011). "Voting on Punishment Systems Within a Heterogeneous Group," *Journal of Public Economic Theory* 13(5), 661-693.
- Ohtake, Fumio, and Saito, Makoto (1998). "Population Aging and Consumption Inequality in Japan," *Review of Income and Wealth* 44, 361-381.
- Okada, Akira and Riedl, Arno (1999). "When Culture Does Not Matter: Experimental Evidence from Coalition Formation Ultimatum Games in Austria and Japan," Manuscript.
- Ooghe, Erwin and Peichl, Andreas (2015). "Fair and Efficient Taxation Under Partial Control," *The Economic Journal* 125(586), 2024-2051.
- Piff, Paul, Kraus, Michael, Côté, Stéphane, Cheng, Bonnie, and Keltner, Dacher (2010). "Having Less, Giving More: The Influence of Social Class on Prosocial Behavior", *Journal of Personality and Social Psychology* 99(5), 771-784.
- Piketty, Thomas (2014). *Capital in the Twenty-First Century*, Cambridge: Belknap Press of Harvard University Press.
- Rey-Biel, Pedro, Sheremeta, Roman, and Uler, Neslihan (2016). "When Income Depends on Performance and Luck: The Effects of Culture and Information on Giving," Manuscript.

- Reuben, Ernesto and Riedl, Arno (2013). "Enforcement of Contribution Norms in Public Good Games with Heterogeneous Populations," *Games and Economic Behavior* 77(1), 122-137.
- Roth, Alvin, Prasnikar, Vesna, Okuno-Fujiwara, Masahiro, and Zamir, Shmuel (1991). "Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An Experimental Study," *American Economic Review* 81(5), 1068-1095.
- Sama, Linda, and Papamarcos, Steven (2000). "Hofstede's I-C Dimension as Predictive of Allocative Behaviors: A Meta-Analysis," *International Journal of Value-Based Management* 13(2), 173-188.
- Schram, Aruthur, and Charness, Gary (2015). "Introducing Social Norms in Laboratory Allocation Choices," *Management Science* 61(7), 1531-1546.
- Singelis, Theodore M., Triandis, Harry C., Bhawuk, Dharm P. S., and Gelfand, Michele J. (1995). "Horizontal and Vertical Dimensions of Individualism and Collectivism: A Theoretical and Measurement Refinement." *Cross-Cultural Research* 29(3), 240-275.
- Stiglitz, Joseph (2012): *The Prince of Inequality: How Today's Divided Society Endangers Our Future*, New York: W.W. Norton & Co.
- Tachibanaki, Toshiaki (2005). *Confronting Income Inequality in Japan: A Comparative Analysis of Causes, Consequences, and Reform*, Cambridge: The MIT Press.
- Tajfel, Henri and Turner, John (1979). "An Integrative Theory of Intergroup Conflict." In *The Psychology of Inter-Group Relations*, edited by Stephen Worchel and William Austin. Monterey: Brooks/Cole.

**Appendix
Not for Publication**

**Appendix A
Additional Data Analysis**

Table A1
TOBIT REGRESSION ANALYSIS OF ALLOCATIONS
INCLUDING DISTRIBUTIVE PREFERENCE QUESTIONS

	Spectator	Anonymous Stakeholder	Known Stakeholder
Intercept	-0.10 (0.189)	0.21 (0.206)	0.42*** (0.110)
Entitlement	0.96*** (0.107)	0.66*** (0.132)	0.45*** (0.066)
Task control	-0.03 (0.032)	0.06 (0.038)	0.01 (0.016)
Basic needs	-0.01 (0.025)	0.01 (0.027)	-0.01 (0.014)
Guaranteed income	0.05 (0.039)	-0.05 (0.038)	-0.03* (0.018)
Efficiency as equality	0.04 (0.041)	-0.01 (0.038)	-0.02 (0.023)
Efficiency as equity	0.01 (0.033)	-0.01 (0.036)	-0.01 (0.021)
Adjusted R^2	0.68	0.34	0.36
No. of obs.	48	48	90

Notes: Standard errors are in parentheses. $N=90$ for Known Stakeholder due to a missing response on the questionnaire. Adjusted R^2 are from OLS.
Significant at *10%, **5%, ***1% level.

Table A2
TOBIT REGRESSION ANALYSIS OF ALLOCATIONS
ON STGB SCALES WITH CONTROLS

	Spectator	Anonymous Stakeholder
Intercept	-0.43 (0.443)	-0.52 (0.604)
Entitlement	0.92*** (0.135)	0.67*** (0.130)
HI	0.00 (0.003)	-0.00 (0.003)
VI	0.00 (0.002)	-0.00 (0.002)
HC	0.00 (0.002)	0.00 (0.004)
VC	-0.00 (0.003)	-0.01 (0.003)
Controls included for age, income, expenditures, earnings, distributive preferences, and dummies for gender, race and country		
Adjusted R^2	0.67	0.41
No. of obs.	47	48

Notes: Standard errors are in parentheses. Adjusted R^2 are from OLS. Significant at *10%, **5%, ***1% level.

TABLE A3
MEAN SCORES ON CULTURE SCALES BY COUNTRY

	US		Japan		Test of Difference in Means (H_0 :US=JP)
	No of Obs.	Mean score (Std. Err.)	No of Obs.	Mean score (Std. Err.)	t-statistic (P-value, two tail)
Horizontal Individualism (HI)	216	54.26 (0.450)	216	43.62 (0.548)	15.01 (0.000)
Vertical Individualism (VI)	215	43.92 (0.744)	215	44.27 (0.587)	-0.37 (0.713)
Horizontal Collectivism (HC)	216	58.16 (0.522)	215	48.81 (0.621)	11.52 (0.000)
Vertical Collectivism (VC)	215	44.67 (0.648)	216	38.50 (0.573)	7.15 (0.000)

Table A4
TOBIT REGRESSION ANALYSIS OF XA ON GROUP X ALLOCATIONS

	Japan	US
Intercept	0.31*** (0.102)	-0.10 (0.407)
Entitlement	0.44*** (0.078)	0.89*** (0.263)
Group X allocation	-0.06 (0.165)	0.31** (0.121)
Adjusted R^2	0.54	0.58
No. of obs.	24	24

Notes: Standard errors are in parentheses. Adjusted R^2 are from OLS. Significant at *10%, **5%, ***1% level.

Table A5
TOBIT REGRESSION ANALYSIS ON DEMOGRAPHIC VARIABLES

Treatmt	No. of obs.	constant	entitlement	age	dummy Female (Male=0, Female=1)	dummy Asian (Asian=1, others=0)	dummy African (African=1, others=0)	dummy Hispanic (Hispanic=1, others=0)	dummy Middle East Asian (Middle East Asian=1, others=0)	expenditure (US \$1000)	parents income	work hours week	earnings (US \$1000)	Adjusted R2 OLS	LR chi2(1) (P-value)	left-censored Obs. (alloc<0)	right-censored Obs. (alloc>1)		
Anon. Stakeh. US	24	coeff est	-0.403	1.052	-0.019	-0.031	-0.014	-0.057	0.180	-0.170	0.024	-0.003	0.001	-0.022	0.304	23.590	0	1	
		(std error)	0.674	0.309	0.028	0.064	0.139	0.142	0.092	0.156	0.008	0.018	0.003	0.010					0.015
		t-statistic (P-value)	-0.600	3.400	-0.670	-0.490	-0.100	-0.400	1.960	-1.080	3.130	-0.150	0.520	-2.290					
Anon. Stakeh. Japan	24	coeff est	0.949	0.549	-0.039	-0.140	(dropped)	(dropped)	(dropped)	(dropped)	0.007	0.039	-0.008	0.018	0.516	27.660	1	2	
		(std error)	0.446	0.147	0.022	0.077					0.002	0.028	0.007	0.023					0.000
		t-statistic (P-value)	2.130	3.730	-1.720	-1.830					2.670	1.410	-1.180	0.770					
Spect. US	24	coeff est	0.068	1.069	0.006	0.031	0.043	(dropped)	0.016	(dropped)	-0.003	-0.019	0.006	-0.009	0.650	35.410	3	1	
		(std error)	0.597	0.163	0.024	0.082	0.107		0.101	(dropped)	0.002	0.030	0.007	0.007					0.000
		t-statistic (P-value)	0.110	6.560	0.260	0.380	0.400		0.150	(dropped)	-1.410	-0.650	0.850	-1.240					
Spect. Japan	23	coeff est	-0.138	1.142	-0.006	0.105	(dropped)	(dropped)	(dropped)	(dropped)	0.003	0.040	-0.009	0.013	0.745	38.710	1	0	
		(std error)	0.305	0.128	0.015	0.037					0.003	0.018	0.005	0.025					0.000
		t-statistic (P-value)	-0.450	8.930	-0.420	2.870					0.810	2.200	-1.920	0.530					
Known Stake. US	43	coeff est	-0.163	0.331	0.026	-0.028	0.025	-0.055	-0.034	(dropped)	0.000	0.014	0.003	-0.013	0.090	15.640	0	1	
		(std error)	0.327	0.136	0.018	0.044	0.049	0.096	0.075		0.001	0.011	0.004	0.009					0.110
		t-statistic (P-value)	-0.500	2.440	1.430	-0.650	0.520	-0.580	-0.450		0.320	1.280	0.840	-1.500					
Known Stake. Japan	47	coeff est	0.102	0.514	0.007	-0.068	(dropped)	(dropped)	(dropped)	(dropped)	0.003	-0.003	0.000	0.003	0.488	39.200	0	0	
		(std error)	0.158	0.069	0.008	0.034					0.003	0.013	0.002	0.015					0.000
		t-statistic (P-value)	0.650	7.430	0.910	-1.990					0.950	-0.260	0.180	0.180					

Notes: For significant results, p-values are colour-coded according to levels of significance. The numbers of observations are sometimes lower than in other analyses due to missing responses on the questionnaire. Where applicable, yen are converted to US\$ with the same ratio used for show-up fees and points, viz., \$1=150 yen.

Table A6
TOBIT REGRESSION ANALYSIS OF RACE FOR KNOWN STAKEHOLDERS

No. of obs.		Parameter estimate									adjusted R2	LR chi2(1) (P-value)	left-cend. obs. (alloc<0)	right-cens. obs. (alloc>1)
		Intercept	Entitlement	Asian to Asian	Asian to Non-Asian	Black to Black	Black to Non-black	White to Non-white	Latino to Latino	Latino to Non-Latino				
44	Coeff est (std err)	0.344 0.072	0.428 0.127	-0.022 0.094	0.008 0.054	(dropped)	-0.047 0.079	0.012 0.054	(dropped)	-0.042 0.064	0.111	11.670 0.070	0	1
	t-stat	4.750	3.380	-0.230	0.150		-0.590	0.220		-0.660				
	(p-value)	0.000	0.002	0.816	0.879		0.557	0.825		0.516				

No. of obs.		Parameter estimate									adjusted R2	LR chi2(1) (P-value)	left-cend. obs. (alloc<0)	right-cens. obs. (alloc>1)
		Intercept	Entitlement	Asian to Asian	Non-Asian to Asian	Black to Black	Non-black to Black	Non-white to White	Latino to Latino	Non-Latino to Latino				
44	Coeff est (std err)	0.342 0.072	0.431 0.126	-0.022 0.094	0.030 0.064	(dropped)	(dropped)	-0.008 0.047	(dropped)	-0.034 0.056	0.129	11.460 0.043	0	1
	t-stat	4.750	3.420	-0.230	0.470			-0.170		-0.610				
	(p-value)	0.000	0.001	0.815	0.641			0.865		0.547				

Notes: For significant results, p-values are colour-coded according to levels of significance. The omitted category in both regressions is White-white. Pairings that did not occur have been dropped.

Table A7
SIGNIFICANT TOBIT REGRESSION RESULTS FOR KNOWN STAKEHOLDERS WITH INTERACTIONS OF ENTITLEMENT WITH GENDER (TOP) AND PARENTS' INCOME (BOTTOM)

	No of Obs.	Parameter estimate									Null hypothesis								
		(standard error)									t-statistic								F-stat (p-val)
		Intercept	Entitle	MF	MF*Ent	FF	FF*Ent	FM	FM*Ent	Intercept	Entitle	MF	MF*Ent	FF	FF*Ent	FM	FM*Ent		
US	44	-0.247 0.356	1.590 0.579	0.748 0.364	-1.522 0.596	0.488 0.395	-1.036 0.673	0.439 0.373	-0.869 0.612	-0.690 0.492	2.750 0.009	2.050 0.047	-2.550 0.015	1.230 0.225	-1.540 0.132	1.180 0.247	-1.420 0.164	3.280 0.011	
Japan	47	0.267 0.049	0.516 0.088	-0.077 0.094	0.176 0.174	-0.026 0.091	(dropped)	0.067 0.103	-0.205 0.170	5.430 0.000	5.860 0.000	-0.820 0.417	1.010 0.317	-0.280 0.781	(dropped)	0.650 0.522	-1.210 0.235	1.300 0.284	

	No of Obs.	Parameter estimate				Null hypothesis				F-stat (p-val)
		(standard error)				t-statistic				
		Intercept	Entitle	PI (Parents' Income)	Ent*PI	Intercept	Entitle	PI (Parents' Income)	Ent*PI	
US	44	-0.18 (0.24)	1.35 (0.48)	0.09 (0.04)	-0.15 (0.08)	-0.760 (0.45)	2.810 0.008	2.310 0.026	-2.010 -0.051	6.640 0.001
Japan	47	-0.16 (0.14)	1.26 (0.25)	0.14 (0.04)	-0.25 (0.08)	-1.190 (0.24)	5.060 0.000	3.280 0.002	-3.220 -0.002	23.150 0.000

Notes: Male-to-Male (MM) is the omitted category in the Gender regressions. For significant results, p-values are colour-coded according to levels of significance.

Table A8
TOBIT REGRESSION ANALYSIS OF STAKES AND YA STATUS FOR KNOWN STAKEHOLDERS

No of	Parameter estimate						Null hypothesis						adjusted R2	
	(standard error)						t-statistic							
	Intercept	Entitle	Stakes	Ent*Stks	YA	YA*Ent	Intercept	Entitle	Stakes	Ent*Stks	YA	YA*Ent		
91	0.467 0.105	0.016 0.180	-0.255 0.112	0.581 0.196	0.109 0.070	-0.155 0.127	4.440 0.000	0.090 0.928	-2.280 0.025	2.970 0.004	1.550 0.124	-1.220 0.226	1.460 0.238	0.416

Notes: YA is a dummy variable equal to 1, when the dictator is the A subject in Room Y. For significant results, p-values are colour-coded according to levels of significance.

Appendix B

Composite Experimental Instructions and General Questionnaire

Versions of Instructions

<u>Treatment</u>	<u>Phase</u>	<u>Allocation Decision</u>	<u>Forms by Subject</u>		
			<u>X</u>	<u>Y</u>	<u>Z</u>
Spectator	1	Spectator	I (X)	I (Y)	
	2		III	III	IV
Anonymous Stakeholder	1	Anonymous Stakeholder	I (X)	I (Y)	
	2		II	II	
Group Stakeholder	1	Group	VII(X)	VII(Y)	
	2		V	V	
	3		VI	VI	

Phase 1 Instructions

Room (X)[Y] (Versions I and VII)

No talking allowed

We ask that you do not talk or communicate with one another in any way, unless the experimenter instructs you to do so. If you have any questions after we finish the instructions or at any time during the experiment, please raise your hand, and the experimenter will approach you and answer your question in private.

Subjects

You have been assigned a Subject ID, which appears on the top right of this sheet. This is used only to track your decisions. You will never know the Subject IDs of subjects in any other group, and they will never know yours.

There are subjects in another room, who are also participating in this experiment. We will call this room Room (X)[Y] and the other room Room (Y)[X]. Subjects in Room X have Subject IDs that begin with the letter X, and subjects in Room Y have Subject IDs that begin with the letter Y. Subjects in both rooms read the same instructions throughout this experiment.

Two phases of experiment

There are two phases to this experiment. In Phase 1, every subject performs a task that involves preparing letters for mailing. For each letter correctly produced, 100 points are earned. **Each point is worth [¥ 1.5/1 cent], so each correct letter is worth [¥ 150/1 dollar].** The subjects in the other room face the same task and also generate 100 points of earnings for each correct letter. Subjects in both rooms are working under the same conditions, with the same kind of materials and producing the same kind of letters. After this task is complete, the letters are counted, and the second phase begins.

In Phase 2 of the experiment, subjects in this room are matched with counterparts in another room to form groups. For each group, the points of the matched subjects are added up and credited to its group account. All of the points in every account will be distributed in cash to the group that shares that account. A given group member cannot be guaranteed any specific amount, however, since that will depend on the decisions of arbitrarily chosen persons. The details of these distributional procedures will be provided after Phase 1 is complete.

Phase 1 task

Now we will explain the details of the first phase. Each of you has in front of you a stack of twenty green sheets, twenty blue sheets and twenty envelopes and to the right of your seat a sealed box. My assistant will now demonstrate the tasks you are to complete. You are to fold the sheets in thirds and put one green and one blue sheet separately in each envelope. Then you close the envelope but do not seal it, and put it through one of the two slots at each end of the box. You may accomplish these tasks in any way you wish as long as the basic results are obtained. Everyone will have five {six} minutes to prepare the letters. The more letters you correctly prepare, the more points are credited to your group account. When I call "Time!" you must cease all activity: leave the remaining materials on your desk – any envelope not already in your box when time is called does not count.

Phase 2 Instructions (Version II)

Matching of subjects

In a moment, we will tell you the results of the Phase 1 task. For the purposes of calculating points to group accounts, subjects will be matched as follows. In this session, each person in Room X is paired with one other person in Room Y to form an X/Y Pair consisting of two people. Each X/Y Pair is assigned an account; the points credited to this account equal the sum of the points earned by the X Subject and the Y Subject in the Phase 1 task.

Allocation of earnings

The subjects in Room X have been arbitrarily chosen to decide how the total points in their accounts will be distributed between the X Subject and the Y Subject. The form you are about to receive will indicate separately for the X Subject and the Y Subject how many letters each correctly prepared, the total number prepared by both subjects, and how many total points have been credited to their account. For subjects in Room X, the form will also include spaces for indicating how much, if any, of the total points each X Subject wishes to allocate to him- or herself and how much, if any, to his or her matched Y Subject. This decision is completely up to the X Subject and is confidential. The X Subject just needs to make sure that the total allocated to the two subjects equals the total available in their account. X Subjects will have five minutes to make their decision and to place the form in the envelope provided. These forms will then be collected, and the individual results of the task and the X Subject decisions sent to the paired Y Subjects along with their payments. We will distribute the results of the Phase 1 task as soon as they have been calculated. Please continue to sit and wait without talking until the results arrive. If you have any questions now or after you receive the form, raise your hand, and I will approach you to answer your question in private.

Phase 2 Instructions

(Version III)

Matching of subjects

In a moment, we will tell you the results of the Phase 1 task. For the purposes of calculating points to group accounts, subjects will be matched as follows. In this session, each person in Room X is paired with one other person in Room Y to form an X/Y Pair consisting of two people. Each X/Y Pair is assigned an account; the points credited to this account equal the sum of the points earned by the X Subject and the Y Subject in the Phase 1 task. In addition, there are subjects in a third room, Room Z, each of whom is matched with one X/Y Pair.

Allocation of earnings

The subjects in Room Z have been arbitrarily chosen to decide how the total points in the X/Y accounts will be distributed between the X Subject and the Y Subject. The form they are about to receive will indicate separately for the X Subject and the Y Subject how many letters each correctly prepared, the total number prepared by both subjects, and how many total points have been credited to their account. The form will also include spaces for indicating how much, if any, of the total points each Z Subject wishes to allocate to his or her matched X Subject and how much, if any, to his or her matched Y Subject. This decision is completely up to the Z Subject and is confidential. The Z Subject just needs to make sure that the total allocated to the two subjects equals the total available in their group account. Z Subjects will have five minutes to make their decision and to place the form in the envelope provided. These forms will then be collected, and the individual results of the task and the Z Subject decisions sent to the X/Y Pairs along with their payments. We will distribute these results as soon as they are available. Please continue to sit and wait without talking until the results arrive.

Instructions

Room Z (Version IV)

No talking allowed

We ask that you do not talk or communicate with one another in any way. If you have any questions after we finish the instructions or at any time during the experiment, please raise your hand, and the experimenter will approach you and answer your question in private.

Subjects

You have been assigned a Subject ID, which appears on the top right of this sheet. This is used to track your decisions, but it is known only to you and the experimenter. You will never know the Subject ID of any other subject, and they will never know yours.

There are subjects in two other rooms, who are also participating in this experiment. We will call this room Room Z and the other rooms Rooms X and Y. Subjects in all rooms have Subject IDs that begin with the letter of their room, hence, subjects in this room have Subject IDs that begin with Z.

Two phases of experiment

There are two phases to this experiment. In Phase 1, every subject in Rooms X and Y performs a task that involves preparing letters for mailing. For each letter correctly produced, 100 points are earned. **Each point is worth [¥ 1.5/1 cent], so each correct letter is worth [¥ 150/1 dollar].** Subjects in both rooms are working under the same conditions, with the same kind of materials and producing the same kind of letters. They also read the same instructions throughout the experiment. After this task is complete, the letters are counted, and the second phase begins. In Phase 2 of the experiment, X and Y subjects are matched together in groups of two. The points of the matched subjects are added up and credited to their group accounts. The people in this room, the Z Subjects, have been arbitrarily chosen to decide the allocation of these earnings between X and Y Subjects.

Phase 1 task

Now we will explain the details of the first phase. Each of the subjects in Rooms X and Y has in front of them a stack of twenty green sheets, twenty blue sheets and twenty envelopes and to the right of their seat a sealed box. My assistant will now demonstrate the tasks they are to complete. They are to fold the sheets in thirds and put one green and one blue sheet separately in each envelope. Then they close the envelope but do not seal it, and put it through one of the two slots at each end of the box. They may accomplish these tasks in any way they wish as long as the basic results are obtained. Everyone will have five minutes to prepare the letters. The more letters they correctly prepare, the more points are credited to their group account.

Phase 2 Decision

In Phase 2 of the experiment, each person in Room X is paired with one other person in Room Y to form an X/Y Pair consisting of two people. Similarly, every person in this room, Room Z, is matched with an X/Y Pair. Each X/Y Pair is assigned an account; the points credited to this account equal the sum of the points earned by the X Subject and the Y Subject in the Phase 1 task. All of the points in every account will be distributed in cash to the matched subjects who share that account. The subjects in this room, Room Z, have been chosen to allocate these earnings between their matched X Subject and Y Subject. For this task all Z Subjects will themselves receive a separate ¥1500/\$10 payment, which has nothing to do with the payments to their X/Y Pairs. This is in addition to the ¥750/\$5 on-time fee all subjects were already paid at the start.

In a moment the results of the task will be made available to you. The exact same information will also be made available to your X/Y Pair. The form you are about to receive will indicate separately for the X Subject and the Y Subject how many letters each correctly prepared, the total number prepared by both subjects, and how many total points have been credited to their account. The form will also include spaces for indicating how much, if any, of the total points you wish to allocate to your matched X Subject and how much, if any, to your matched Y Subject. This decision is completely up to you and is confidential. You just need to make sure that the total allocated to the two subjects equals the total available in their group account. You will have five minutes to make your decision and to place the form in the envelope provided. These forms will then be collected. After all Z Subjects have been paid and have departed, the individual results of the task and the Z Subject decisions will be sent to the X/Y Pairs along with

their payments. If you have any questions now or after you receive the form, raise your hand, and I will approach you to answer your question in private.

Phase 2 Instructions

(Version V)

Matching of subjects

In a moment, we will tell you the results of the Phase 1 task. For the purposes of calculating points to group accounts, subjects will be matched as follows. In this session, each person in Room X is paired with one other person in Room X to form an X Group. Similarly, each person in Room Y is paired with one other person in Room Y to form a Y Group. Each X Group in Room X is also matched with one Y Group in Room Y to form an X/Y Group consisting of four people: two X Subjects in an X Group plus two Y Subjects in a Y Group. Each X/Y Group is assigned an account; the points credited to this account equal the sum of the points earned by the X Group and the Y Group in the Phase 1 task.

Allocation of earnings

The subjects in Room X have been arbitrarily chosen to decide how the total points in their accounts will be distributed between the X Group and the Y Group. The form you are about to receive will indicate how many letters the X Group and the Y Group combined correctly prepared, and how many total points have been credited to their X/Y Group account. For subjects in Room X, the form will also include spaces for indicating how much, if any, of the total points each X Group wishes to allocate to itself and how much, if any, to its matched Y Group. This decision is completely up to the X Group and is confidential. The X Group just needs to make sure that the total allocated to the two groups equals the total available in their X/Y Group account. X Groups will have five minutes to make their decision and to place the form in the envelope provided. During this phase of the experiment, the two subjects in each X Group may, of course, speak quietly with one another. They are not, however, to speak with other X Groups or to speak loudly enough to be heard by other groups. Each X Group will then put its decision in the envelope provided. If at the end of the five minutes, the two subjects in an X Group cannot agree on an allocation, one member of the group will be randomly chosen to make the allocation. These forms will then be collected, and the results sent to the matched Y Groups. At that point, the two subjects in each Y Group may speak quietly with one another. They are not, however, to speak with other Y Groups or to speak loudly enough to be heard by other groups. We will distribute the results as soon as they have been calculated. At that time, some subjects will be asked to stand up and change seats in order to sit next to the subject in their group. Please continue to sit and wait without talking until the results arrive. If you have any questions now or after you receive the form, raise your hand, and I will approach you to answer your question in private.

Further Phase 2 Instructions

(Version VI)

No talking allowed

Once again, we ask that you do not talk or communicate with one another in any way. You will have an opportunity to ask questions after we finish reviewing the instructions.

Final decision

The final decision of Phase 2 also concerns the distribution of earnings. Each X Group has now chosen an amount of the total points to allocate to itself and an amount to allocate to its matched Y Group. The current decision is how to allocate those amounts to the two subjects within each separate group in Room X and Room Y. This decision will be made independently for every group in Rooms X and Y. For each group, one person, called Subject A, will be arbitrarily chosen to decide how the points in their group account will be distributed between himself/herself, Subject A, and the other subject, called Subject B, in their group.

Each Subject A is about to receive a form that indicates, for his/her group, how many letters Subject A and Subject B each correctly prepared, the total number prepared by both subjects, and how many total points have been credited to their account according to the previous decision by the X Group. The form will also include spaces for indicating how much, if any, of the total available points Subject A wishes to allocate to himself/herself and how much, if any, to A's paired Subject B. This decision is completely up to Subject A. Subject A just needs to make sure that the total allocated to the two subjects equals the total available in their group account. Subject A will have five minutes to make this decision and to place the form in the envelope provided. These forms will then be collected. After all A Subjects have been paid and have departed, the individual results of the task and the A Subject decisions will be sent to the paired B Subjects along with their payments.

Please continue to sit and wait without talking until the results arrive. If you have any questions now or after you receive the form, raise your hand, and I will approach you to answer your question in private.

Appendix C Post-experimental Questionnaire

General Questionnaire

Please answer these questions about yourself, indicating just one answer per question.

1. What is your college?

- | | |
|--------------------------------|---------------------------|
| 1 Business | 3 Liberal Arts |
| 2 Communications and Fine Arts | 4 Science and Engineering |

2. What is your first major (if undeclared, write UD)?

3. What year in college are you?

- | | |
|-------------|------------|
| 1 Freshman | 3 Junior |
| 2 Sophomore | 4 Senior |
| | 5 Graduate |

4. What is your age?

_____ years

5. What is your gender?

- | | |
|--------|----------|
| 1 Male | 2 Female |
|--------|----------|

6. What is your ethnicity (if several apply, please choose the one that you consider most accurate)?

- | | |
|--------------------------|-----------------------------------|
| 1 Asian/Pacific-Islander | 4 Latino/Hispanic |
| 2 Black/African-American | 5 Middle-Eastern |
| 3 Caucasian | 6 Native-American/American Indian |

7. What is your best estimate of your total expenditures this school year (September through May)? Please consider all expenses including tuition, housing, food, clothing, transportation, entertainment, etc., even if some are covered by financial aid or grants.

\$_____ for the current school year (September through May)

8. What was the total (gross) income last year of your parents or guardians? Exclude your own earnings. Please choose a single response, even if it is a guess.

- | | |
|-----------------------------------|------------------------------------|
| 1 \$0 to less than \$25,000 | 5 \$100,000 to less than \$125,000 |
| 2 \$25,000 to less than \$50,000 | 6 \$125,000 to less than \$150,000 |
| 3 \$50,000 to less than \$75,000 | 7 \$150,000 or more |
| 4 \$75,000 to less than \$100,000 | |

9. How many hours per week do you usually work (Enter 0 if none)?

_____ hours per week

10. Approximately how much money have you earned total through your work over the past year (the past twelve months)?

\$ _____

Please indicate your agreement or disagreement with the statements below on the four-point scale provided.

11. Consider the task in this experiment, and indicate your agreement or disagreement with this statement:

The performance of subjects on the task in this experiment was due mostly to things that they could control, like their effort or their decisions, as opposed to things they cannot control, like innate ability.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

12. The basic needs of people for food, clothing and shelter differ greatly across individuals.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

13. There should be the same income guarantee for all people.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

14. The way for companies to be most productive and efficient is by minimizing differences in pay across workers.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

15. The way for companies to be most productive and efficient is by paying workers according to their productivity.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

Consider now the questions below. Respond on the nine-point scale provided, the key to which is repeated at the top of each of the following pages.

Please indicate your sense of the event's frequency or your degree of agreement with each statement below. Use the following scale where 1 means *never* or *definitely no* and 9 means *always* or *definitely yes*:

Never								Always
1	2	3	4	5	6	7	8	9
Definitely no								Definitely yes

1. I often do "my own thing."

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

2. One should live one's life independently of others.

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

3. I like my privacy.

- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
4. I prefer to be direct and forthright when discussing with people.
- | | | | | | | | | | |
|--|---------------|---|---|---|----------------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | Never | | | | Always | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | Definitely no | | | | Definitely yes | | | | |
5. I am a unique individual.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
6. What happens to me is my own doing.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
7. When I succeed, it is usually because of my abilities.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
8. I enjoy being unique and different from others in many ways.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
9. It annoys me when other people perform better than I do.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
10. Competition is the law of nature.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
11. When another person does better than I do, I get tense and aroused.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
12. Without competition, it is not possible to have a good society.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
13. Winning is everything.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
14. It is important that I do my job better than others.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
15. I enjoy working in situations involving competition with others.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
16. Some people emphasize winning; I'm not one of them.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
- (Note: this question is reverse scored.)*
17. The well-being of my co-workers is important to me.
- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|

18. If a co-worker gets a prize, I would feel proud.

1 2 3 4 5 6 7 8 9

Never

1 2 3 4 5 6 7 8 9

Always

Definitely no

Definitely yes

19. If a relative were in financial difficulty, I would help within my means.

1 2 3 4 5 6 7 8 9

20. It is important to maintain harmony within my group.

1 2 3 4 5 6 7 8 9

21. I like sharing little things with my neighbors.

1 2 3 4 5 6 7 8 9

22. I feel good when I cooperate with others.

1 2 3 4 5 6 7 8 9

23. My happiness depends very much on the happiness of those around me.

1 2 3 4 5 6 7 8 9

24. To me, pleasure is spending time with others.

1 2 3 4 5 6 7 8 9

25. I would sacrifice an activity that I enjoy very much if my family did not approve of it.

1 2 3 4 5 6 7 8 9

26. I would do what would please my family, even if I detested that activity.

1 2 3 4 5 6 7 8 9

27. Before taking a major trip, I consult with most members of my family and many friends.

1 2 3 4 5 6 7 8 9

28. I usually sacrifice my self-interest for the benefit of my group.

1 2 3 4 5 6 7 8 9

29. Children should be taught to place duty before pleasure.

1 2 3 4 5 6 7 8 9

30. I hate to disagree with others in my group.

1 2 3 4 5 6 7 8 9

31. We should keep our aging parents with us at home.

1 2 3 4 5 6 7 8 9

32. Children should feel honored if their parents receive a distinguished award.

1 2 3 4 5 6 7 8 9