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Karl Schurter
University of Chicago

Bart J. Wilson
Chapman University, bjwilson@chapman.edu

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Justice and Fairness in the Dictator Game

Karl Schurter* and Bart J. Wilson†

This article uses a laboratory experiment to examine the question of whether justice and fairness are different motivational forces in the dictator game. "Justice" and "fairness" are often used interchangeably because their meanings and usages are so closely linked, despite their distinct connotations. Using four different treatments, our experimental design investigates the subtle differences between the two social concepts to explicate generosity in the dictator game. The results indicate that justice, not fairness, legitimizes property rights in the dictator game.

JEL Classification: C70, C91, D63

1. Introduction

The underlying motives supporting the simplest of decisions may not be as transparent as they seem at first blush. One seemingly simple game is the dictator game (DG), in which Player A is given an endowment that he then allocates to himself and his counterpart, Player B. Player B has no strategic decision to make; Player A's decision is final. The power of a DG is that it isolates the subjects' opinions regarding their just reward relative to their counterparts' without explicitly invoking any strategic or reciprocal considerations for Player B. Hence, whatever amount Player A offers Player B may be considered a "gift." A typical distribution of offers with initial endowment, e, is bimodal at the predicted offer (e, 0) and the equitable offer ($0.5e$, $0.5e$), where the first element indicates the dictator's payoff and the second the receiver's (Camerer 2003). Forsythe et al. (1994) find that 70% of dictators give some amount to Player B, with the gift size averaging roughly 25% of the initial endowment.

Despite the DG's apparent simplicity vis-à-vis game theory, there are ways to systematically shift the distribution of offers away from or toward the predicted (e, 0) outcome. Changing the social distance by varying the anonymity of the dictator and/or establishing property rights are two such experimental procedures (Hoffman et al. 1994; Hoffman, McCabe, and Smith 1996; Cherry, Frykblom, and Shogren 2002; Koch and Normann 2008; Oxoby and Spraggon 2008). Hoffman et al. (1994) establish property rights for Player A by administering the same random trivia quiz to all of the subjects and then assigning the top performers to the advantaged role of dictator. The subjects are aware of this advantage and feel that they have earned their position. As a result, the modal offer shifts from $0.3e$ to 0. The random trivia quiz, however, confounds two potential factors of economic decision

* University of Virginia, Charlottesville, VA 22904, USA; E-mail kes3u@virginia.edu.

† Economic Science Institute, Chapman University, One University Drive, Orange, CA 92866, USA; E-mail bartwilson@gmail.com; corresponding author.

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making. Because the fair procedure is a part of establishing merit, it is impossible to determine how the components affect the dictator's decision: the fair quiz or the meritorious ranking. This experiment attempts to unpack concerns of fairness (the equal opportunity to be advantaged) from concerns of justice (the just reward of merit) in the dictator game.[1] Appendix A provides a background discussion of justice and fairness.

A practical example is the qualifying laps in a NASCAR race. In a random order, one-by-one, each car goes two laps around the track, and the faster of the two lap times is selected as the car's qualifying lap time. The car with the fastest qualifying lap time "starts on the pole" (is given the first position at the start of the actual race); the second position goes to the second fastest, and so on. The question is: "Do drivers and others involved accept these rankings because every car has an equal opportunity to outperform the others or because the higher-seeded cars merit their advantaged position?" As with the random trivia quiz, the confusion makes it impossible to determine whether it is equal opportunity (which we will refer to as fairness) or greater merit (which we will refer to as justice) that legitimizes giving one car an advantage over others.

Even though the concepts of justice and fairness are closely linked, their meanings are not identical; that is, they are not perfectly substitutable in everyday use. Wierzbicka (2006) reports that the word "fair" carries a distinct connotation and moreover is uniquely English in origin. Other languages, for example, German, borrow the term from English even when they have equivalent words for the word "just," implying that the conceptual difference between justice and fairness is universal even though there is not always a distinct word in non-English languages. This observed linguistic difference and its ramifications in economics provide the motivating question for this study.

There have been efforts to incorporate these concepts of fairness, equity, and justice into noncooperative game theory (see, e.g., Rabin 1993; Fehr and Schmidt 1999; Morelli and Sacco 1997, respectively). However, these approaches do not distinguish between justice and fairness, nor do they provide empirical evidence. Frohlich, Oppenheimer, and Eavey (1987) use a laboratory experiment to test the Rawlsian theory that people will behave in order to maximize the minimum payoff for everyone when making decisions behind a veil of ignorance, but to our knowledge, there have not been any previous empirical studies that address the question put forward in this article. For the sake of clarity, the words "fair" and "fairness" in the context of our DG connote equal opportunity via the rules of the game in entitling half of the participants to be the advantaged dictators, and "just" and "justice" connote the reward of a meritorious ranking in the entitlement stage to be the dictator.

While much of the current research attempts to answer the question why people choose equitable outcomes over the equilibrium, our question asks what makes people feel justified in keeping the endowment. Put another way, we hope to more precisely identify conditions of entitlement under which the social norms vary from an equal split. List elucidates the effect of social norms on dictator behavior when he discusses the "power of changing the giver and recipient expectations" (2007, p. 490), where expectations are defined by social norms derived from the "relevant properties of situations" (p. 491).[2] In this experiment the relevant property

[1] Note that because the dictators are stakeholders in the final allocation, they have an incentive to deviate from the ideals of justice and fairness (Konow 2003). Thus, the dictator is not the source of justice and fairness in this experiment. Rather, the dictator is the intermediary through whom we measure the effects of the property rights endowed by the impartial experiment monitor.

[2] The term "relevant properties" includes a large range of variables from the framing of the situation (Brañas-Garza 2007) to whether the recipient is a human or a charitable organization (Eckel and Grossman 1996).

is the entitlement stage, and we will vary the conditions under which the property right is established to isolate the impacts of justice and fairness on decisions in a DG.

The article proceeds as follows: Section 2 outlines the experimental procedures and hypotheses, section 3 reports our results, and section 4 includes a discussion of our results as they pertain to justice and fairness in DGs.

2. Experimental Design and Procedures

As the NASCAR example demonstrates, justice and fairness are not mutually exclusive concepts: A meritorious ranking does not preclude a fair procedure, and vice versa. It is also worth noting that the rules that evoke these concepts do not lead to contradictory outcomes. Based upon the rules, participants may deem an allocation to be fair, just, both fair and just, or neither.[3] In the following section, we describe four entitling mechanisms that are the result of conceptually crossing the presence and absence of an explicitly fair procedure (equal opportunity to be advantaged) with the presence and absence of a merit-based hierarchy.

To isolate the effect of fairness, we begin by establishing property rights on the basis of a fair procedure without establishing one person as more deserving than the other. The game "rock, paper, scissors" or flipping a coin is one way to achieve this in common practice. However, a coin flip must be agreed upon by the two players, as opposed to exogenously imposed by the experimenter. This arises from the fact that an unfair procedure is one in which a player may legitimately protest the result, as may be the case when they have not explicitly agreed to play by the rules. Therefore, informed consent is an integral part of guaranteeing that the entitlement stage of the treatments with fair procedures are indeed fair; players who are fully informed of the procedure and have agreed to participate have no grounds for protest.[4] We implement the explicit consent to the rules of the entitlement stage at the end of the instructions when the subjects must either click an "I Agree" button or a "Leave Now" button. Only players who accept the rules of the game participate in the experiment, while those who do not consent are free to leave. For the purpose of cross-treatment comparisons, we implement this experimental procedure in all treatments.

In recent studies by Lazear, Malmendier, and Weber (2006) and Dana, Cain, and Dawes (2006), dictators are allowed to opt out of participating in the DG after the entitlement stage, but receivers are not allowed to choose. The opportunity cost of leaving or staying is affected by the different timings of the decision to leave, and consequently, the significance of that decision changes. The opportunity cost of leaving in Lazear, Malmendier, and Weber (2006) is behaving altruistically, and the cost of staying is any discomfort experienced in making a decision as the first mover. Dana, Cain, and Dawes (2006) implement the same nonmaterial costs of leaving and staying, but there is an additional $1 pecuniary opportunity cost incurred

[3] Also, the absence of a fair procedure does not automatically make an allocation "unfair." An allocation is unfair only if it violates implicit or explicit rules. If there simply are no such rules, then an allocation can be neither fair nor unfair.

[4] Note that a "Subject Consent Form" that all subjects sign before entering the laboratory is not sufficient for establishing an explicit fair procedure because they do not yet know the experimental procedures. Participants click the "I Agree" button as a signal to other subjects that they understand the procedure and want to proceed, whereas the consent form is a contract between the experiment monitor and an individual. Though informed consent helps guarantee the procedure will be deemed as fair, as long as no one protests the result, a procedure can be fair without requiring this consent.

by leaving. In our experiment the opportunity cost of leaving is variable between zero and the total endowment, inclusive, and there is no opportunity cost of staying. We are not interested that some people may choose to leave our experiment; rather, the purpose of the "I Agree" button is to be explicit that the participants voluntarily agree to the rules of the game. The option to leave is merely the necessary counterpart to the option to stay.

In this attempt to isolate justice, we seek a set of experimental procedures that establish one person as the one with greater merit without the use of a fair procedure. Social indicators of status usually serve this purpose. Often there is no indication of how fairly or unfairly someone arrives at his or her current circumstances, yet two people are regarded differently based on how members of the social group judge one's merit relative to that of the other. The challenge in the laboratory is to recreate this phenomenon. The criteria for sorting participants into a meaningful ranking must be customary to the situation and acceptable to those involved. For the purposes of this experiment, we rank the participants by their number of credit hours completed or in progress. This sorting technique solves the problem of recreating the type of meritorious social hierarchies commonly observed in ordinary college life, as upperclassmen typically receive special privileges in campus housing, course selection, and parking. The advantaged role of a dictator is a reasonable extension of this custom.

Procedures

As the subjects entered the room, they were given their show-up payment of $7 and were seated at visually isolated computer terminals. They then privately read a set of on-screen instructions, which are provided in Appendix B. At the end of the instructions, they were asked to enter their full name and decide to leave or stay for the entire experiment by clicking on one of two buttons labeled "I Agree" and "Leave Now."

Our four treatments described below vary in the entitlement stage: *Unannounced* (baseline), *Quiz*, *Die Roll*, and *Seniority*. After the entitlement stage, dictators allocated their $16 endowments via a computer interface. Screenshots from the experiment are provided in Appendix C. In the *Unannounced* treatment, Player A is randomly decided by the computer. This treatment replicates the most common baseline in DG experiments, with two exceptions. Many DGs are implemented without computers, making the role-assignment process more transparent to the subject. Hence, regardless of whether an announcement is made regarding how the roles of dictator and receiver are assigned, the subjects may correctly infer that the assignments are completely random. To limit the subjects' ability to make these inferences, the instructions simply say that they "will know if [they] are an A or a B once everyone finishes reading the instructions."

We note one more difference in our procedures, namely, that our subjects must agree to participate after reading the instructions. There is, however, nothing in this agreement that specifies what entitles someone to be the dictator. Because it is simply unstated and hence unknown what determines whether someone is or is not a dictator, there are no explicitly fair procedures in the *Unknown* treatment, nor is there a meritorious ranking present in this treatment.

We simultaneously implement a fair procedure and a meritorious ranking by having the subjects in the *Quiz* treatment take a trivia quiz containing general questions about George Mason University and its history. The instructions inform the subjects that "The positions of

the A and B will be determined by *ranking [their] scores on a quiz on Mason trivia.*" Their ranks are based on their scores on the quiz, with ties being decided by giving the higher rank to the person who finished the quiz first. Player A's are the top-ranking half of the group and are paired with the lower-ranking half, such that the highest-ranking Player A is matched with the lowest-ranking Player B. At no point do we inform the subjects of their actual rank. In sum, the *Quiz* treatment contains a fair procedure because the subjects have equal opportunity to do well on the quiz, and, at the same time, it contains a meritorious ranking because they are sorted by achievement, a merit-based desert.

As a contrast to the *Unannounced* treatment, the purpose of the *Die Roll* treatment is to explicitly implement a fair procedure in entitling the dictators.[5] As the treatment name indicates, the positions of Player A and B in the *Die Roll* treatment are determined by a game of chance. Immediately after all the players have read the instructions and are ready to begin, two buttons labeled "Even" and "Odd" appear on their screens. Only one person from each pair is allowed to select an option. If a person selects "Even," then his counterpart's buttons disappear, and she is informed that she is "Odd" by default. After one person from each pair has made a selection, the monitor rolls a six-sided die in the front of one subject, announces the result (even or odd) aloud, and asks the subject to confirm the result. The person in each pair who correctly guesses the outcome is Player A. In *Die Roll*, there is no meritorious ranking because achievement or skill does not play a role in the allocation. However, it does contain a fair procedure for entitling the dictator, as the instructions explicitly state, "There is an equal chance of the roll being odd or even."

In contrast to *Quiz*, the *Seniority* treatment provides a purely meritorious hierarchy based only on past achievement; there is no element of equal opportunity, and hence there is no fair procedure. The players are ranked by seniority as determined by the number of credit hours they have completed or are currently taking. We ask them to volunteer this information on the subject consent form before they know for what purpose it will be used. Player As are the top-ranking half of the group and are paired with the lower-ranking half such that the highest-ranking Player A is matched with the lowest-ranking Player B. As in *Quiz*, at no point do we inform the subjects of their actual rank. Again, the entitlement stage is not fair simply because subjects agree to participate in the experiment. A legitimate *ex post* protest in the *Seniority* treatment could be that a subject's number of credit hours is not an appropriate measure of just reward.[6]

In sum, these four treatments are distinguishable along two dimensions: the presence or absence of a fair procedure within the entitlement stage and the presence or absence of a meritorious ranking in the entitlement stage. Table 1 summarizes the four combinations of our treatments.

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[5] No information is provided to the subjects about how the roles are determined. They may give the experimenter the benefit of the doubt that all participants receive equal opportunity, but there is nothing in the procedures that makes it explicit. As a spoiler, the results in the next section indicate that that could indeed be the case.

[6] An accidental case in point illustrates. Despite our attempts to recruit only undergraduate participants, one graduate student managed to participate in the *Seniority* treatment. This student reported his total number of graduate credit hours and clicked on the "I Agree" button, and yet this student complained to the authors when an undergraduate dictator offered him $0. (An undergraduate can easily complete over 100 credits, but graduate students could never complete that many graduate credits.) Hence, the *Seniority* treatment involves merit but not fair procedures, as this student made clear to us.

Table 1. Experimental Design

	Meritorious Ranking	No Meritorious Ranking
Fair procedure	*Quiz*	*Die Roll*
No fair procedure	*Seniority*	*Unannounced*

Subjects

One hundred seventy-one undergraduates and one graduate student were recruited from George Mason University at large for an experiment in economic decision making.[7] There were 40, 44, 44, and 44 subjects in *Unannounced*, *Quiz*, *Die Roll*, and *Seniority*, respectively. No subject had prior experience in an extensive-form game prior to this experiment; although, some may have participated in another economic experiment. Subjects were paid \$7 when seated at the computer terminal for showing up on time, and those who participated were also paid privately according to the dictators' decisions. Subjects participated in groups of 22 (except for one *Unannounced* session for which only 18 showed up).

Hypotheses

We posit five hypotheses. Let $\tilde{\mu}$ denote the median offer from Player A to Player B. Based upon prior research discussed above, we hypothesize that the offers in *Quiz* are less than the offers in *Unannounced*; that is, for hypothesis H^1 we test the null hypothesis that $\tilde{\mu}_{Quiz} = \tilde{\mu}_{Unannounced}$ against the alternative that $\tilde{\mu}_{Quiz} < \tilde{\mu}_{Unannounced}$.

As discussed above, a quiz confounds the concepts of a fair procedure and meritorious desert. Hence, it is unclear how the offers in *Quiz* will compare with the offers in *Seniority*.[8] If we observe that offers in *Seniority* are greater than offers in *Quiz*, this would suggest that merit alone does not legitimize the dictator's property right. If we observe that offers in *Seniority* are less than offers in *Quiz*, this would suggest that the "fair" procedure is not perceived as fair and is detracting from the merit established by the trivia quiz.

The observed relationship between the three noncontrol treatments is central in our attempt to unpack justice and fairness in the dictator game. Because a fair procedure in combination with merit would legitimize a property right to at least the same degree as a fair procedure alone would, we hypothesize that the median offer in *Quiz* will be smaller than the median offer in *Die Roll*; that is, the null hypothesis in H^2 is $\tilde{\mu}_{Quiz} = \tilde{\mu}_{DieRoll}$ and the alternative hypothesis is $\tilde{\mu}_{Quiz} < \tilde{\mu}_{DieRoll}$. This hypothesis is motivated by Hoffman and Spitzer (1985), who find that an entitlement stage consisting of a game of skill produces more unequal divisions than a simple coin flip.

We next hypothesize that the offers in *Seniority* will be less than in *Unannounced* because the merit-based desert established during the entitlement stage will justify keeping more of the endowment; that is, in H^3 we test the null hypothesis that $\tilde{\mu}_{Seniority} = \tilde{\mu}_{Unannounced}$ against the alternative that $\tilde{\mu}_{Seniority} < \tilde{\mu}_{Unannounced}$.

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[7] See note 6.

[8] We note that the theory of preferences in Cox, Friedman, and Sadiraj (2008), even with a "status" axiom, makes no prediction regarding these two property right treatments. This is not surprising, for as Wilson (2008) argues, internal rules of fairness and justice are part of the unobservable institution of a microeconomic system and not the environment, as modeling them axiomatically via preferences assumes.

Table 2. Hypotheses

	Null Hypothesis	Alternative Hypothesis
H^1	$\tilde{\mu}_{Quiz} = \tilde{\mu}_{Unannounced}$	$\tilde{\mu}_{Quiz} < \tilde{\mu}_{Unannounced}$
H^2	$\tilde{\mu}_{Quiz} = \tilde{\mu}_{DieRoll}$	$\tilde{\mu}_{Quiz} < \tilde{\mu}_{DieRoll}$
H^3	$\tilde{\mu}_{Seniority} = \tilde{\mu}_{Unannounced}$	$\tilde{\mu}_{Seniority} < \tilde{\mu}_{Unannounced}$
H^4	$\tilde{\mu}_{Seniority} = \tilde{\mu}_{DieRoll}$	$\tilde{\mu}_{Seniority} \neq \tilde{\mu}_{DieRoll}$
H^5	$\tilde{\mu}_{DieRoll} = \tilde{\mu}_{Unannounced}$	$\tilde{\mu}_{DieRoll} < \tilde{\mu}_{Unannounced}$

Also, because of mixing of the justice and fairness motives in the *Quiz* treatment, we cannot predict the magnitude or direction of the distribution shift between *Seniority* and *Die Roll*. Hence in H^4 we test the null hypothesis that $\tilde{\mu}_{Seniority} = \tilde{\mu}_{DieRoll}$ against the alternative that $\tilde{\mu}_{Seniority} \neq \tilde{\mu}_{DieRoll}$. If we find that $\tilde{\mu}_{Seniority} < \tilde{\mu}_{DieRoll}$, we would conclude that justice is the predominant factor in legitimizing the dictator's property right. In other words, that subjects took the same quiz under the same conditions is not as important as the resultant meritorious ranking in legitimizing property rights. If instead we find that $\tilde{\mu}_{Seniority} > \tilde{\mu}_{DieRoll}$, we would conclude that subjects respond more to the fair procedure than to the meritorious rank. If the difference in offers in *Die Roll* and *Seniority* is statistically insignificant, it does not necessarily mean that subjects view justice and fairness as equivalent concepts in the DG. It may be that subjects recognize the difference between justice and fairness but treat them as equally legitimate reasons for keeping more of the endowment. In this case the median offers in *Quiz* and *Seniority* are expected to be the same, and we would have to conduct further investigation to determine the subjects' views on the conceptual distinctions between justice and fairness.

For the remaining pairwise comparison, we hypothesize that the offers in *Die Roll* will be less than the offers in *Unannounced* because the explicit fair procedure in *Die Roll* contrasts with the implicit procedure in *Unannounced*. By making the procedure explicit, and then by having subjects agree to the rules, we expect Player As to offer less of the endowment to Player Bs because there is no ambiguity as to how the roles are assigned; that is, the null hypothesis in H^5 is $\tilde{\mu}_{DieRoll} = \tilde{\mu}_{Unannounced}$, and the alternative hypothesis is $\tilde{\mu}_{DieRoll} < \tilde{\mu}_{Unannounced}$.

The hypotheses are enumerated in Table 2.

3. Results

First we report that every subject in each treatment agreed to participate in the experiment by clicking on the "I Agree" button. Table 3 reports that the average offer in *Unannounced* was \$5.70 (or 35%) of the initial endowment of \$16. In *Die Roll* the average was \$5.45 (34%); in

Table 3. Summary Statistics

	Average Offer (Percentage of Endowment)	Median Offer
Unannounced	\$5.70 (35%)	\$6.00
Die Roll	\$5.45 (34%)	\$6.50
Quiz	\$3.77 (24%)	\$3.50
Seniority	\$2.95 (18%)	\$2.00

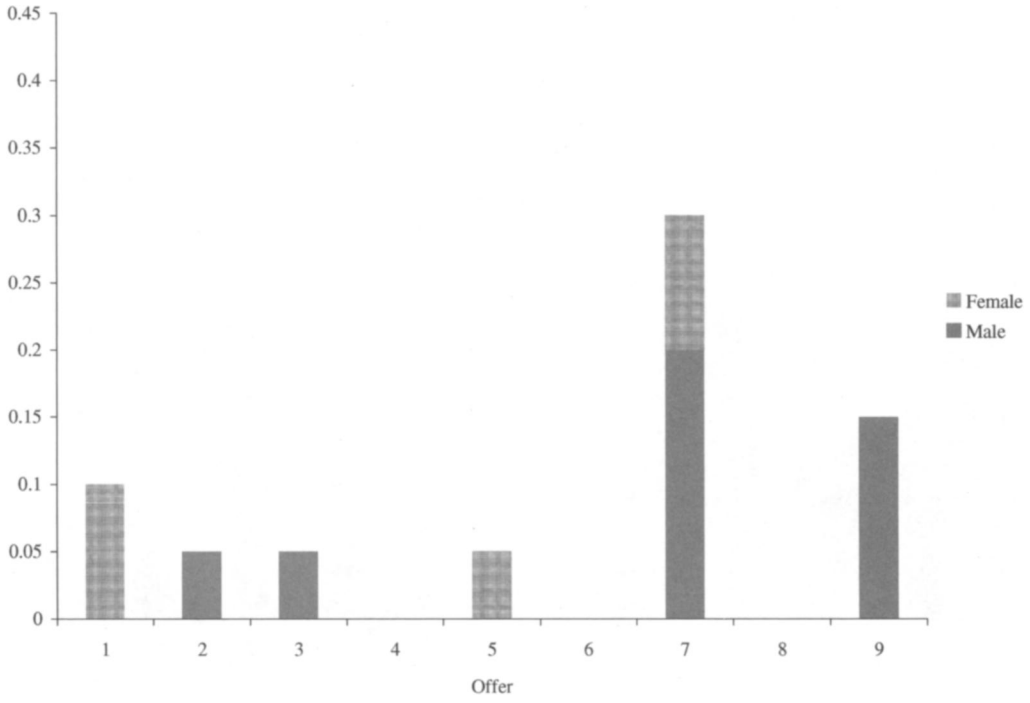

Figure 1. Distribution of Offers in *Unannounced*

Quiz the average was \$3.77 (24%); and in *Seniority* the average was \$2.95 (18%). Figures 1–4 depict the offer distributions.[9]

In *Unannounced*, only two people kept the entire \$16 endowment, and eight people chose to split it evenly—that is, 90% of our dictators give a nonzero amount to Player B as compared to the 70% who give a nonzero amount in Forsythe et al. (1994). To explain this variation, recall that our baseline procedures differ from Forsythe et al. in that our subjects explicitly agree to the rules. This emphasis on consent may account for the differences between our baseline offer distribution and the distribution typically observed. Another difference is that our Player As and Bs sit at visually isolated computer terminals in the same room, as opposed to Forsythe et al., in which the Player As and Player Bs are in separate rooms.[10] Forsythe et al. does not report whether or not the participants are visually isolated.

Using the Kruskal-Wallis statistic for one-way analysis of variance, we first find that at least one of the four treatments is statistically different from the others (uncorrected for ties in rank, $p = .026$; corrected for ties, $p = .022$). For pairwise comparisons, we use the Wilcoxon rank sum statistic to test the null hypothesis that the median offers in each pair are equal against the alternatives discussed in the previous section. Table 4 summarizes the p-values obtained from these tests.

From Table 4, we draw the following conclusions:

(i) We reject the null hypothesis in H^1 in favor of the alternative that offers in *Quiz* are less than offers in *Unannounced*

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[9] We break down the data by gender and note here that there is no significant difference across gender of the offers made in any of the four treatments using a two-sided Wilcoxon rank sum test (all p-values > 0.10).

[10] Because the Player A and B roles are not assigned until after the subjects have read the on-screen instructions, we cannot seat them in separate rooms.

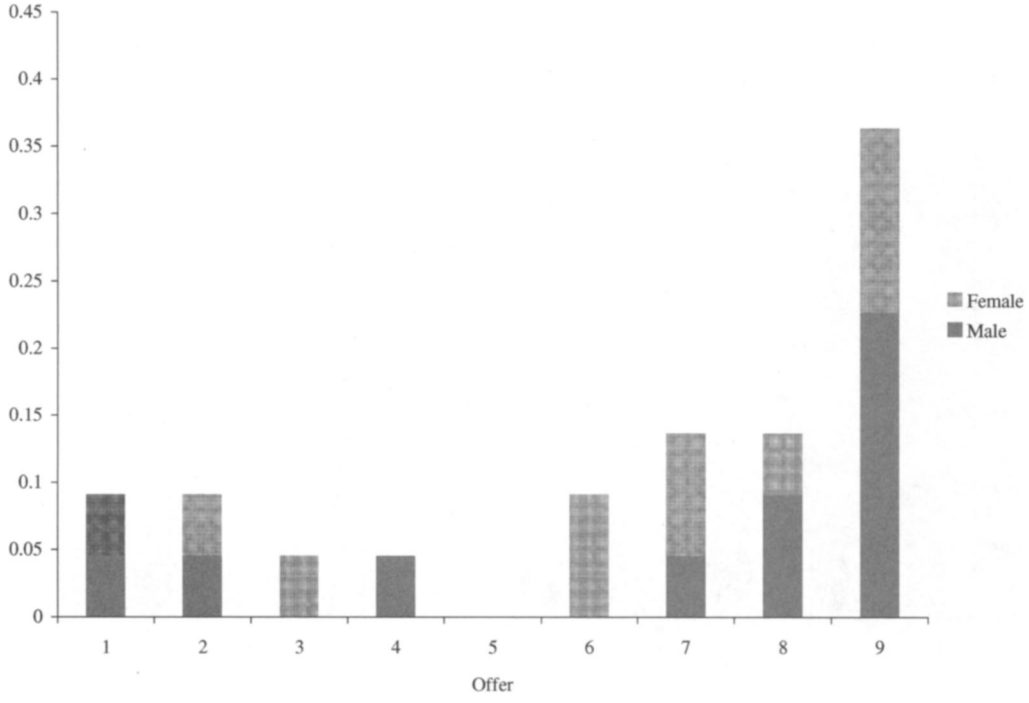

Figure 2. Distribution of Offers in *Die Roll*

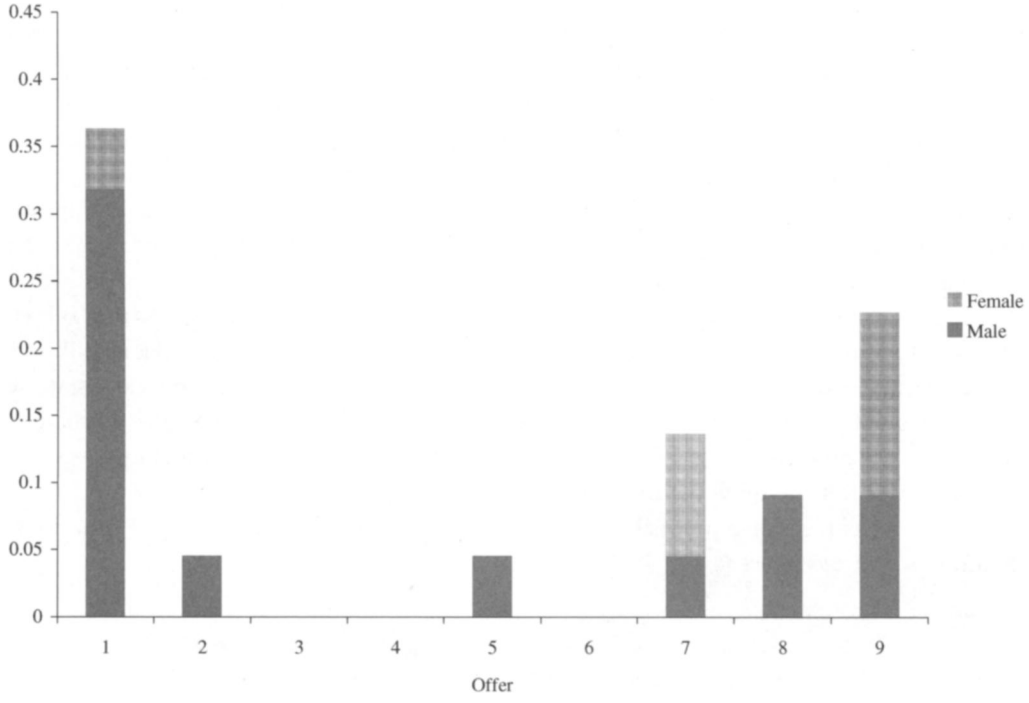

Figure 3. Distribution of Offers in *Quiz*

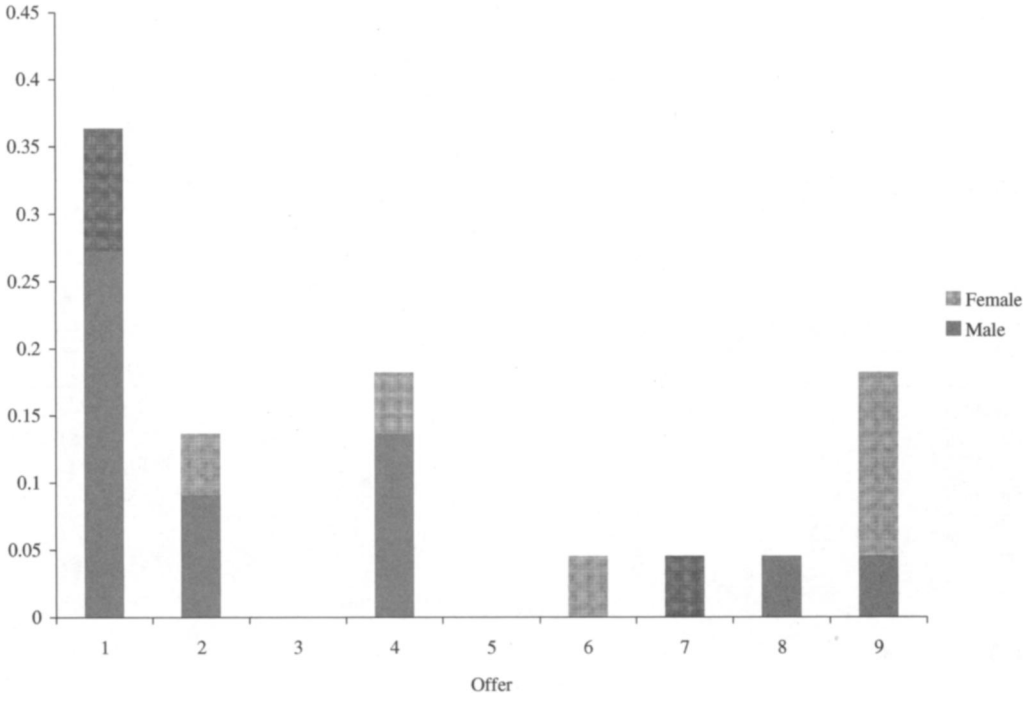

Figure 4. Distribution of Offers in *Seniority*

(ii) We reject the null hypothesis in H^2 in favor of the alternative that offers in *Quiz* are less than offers in *Die Roll*

(iii) We reject the null hypothesis in H^3 in favor of the alternative that offers in *Seniority* are less than offers in *Unannounced*

(iv) We reject the null hypothesis in H^4 in favor of the two-sided alternative that offers in *Seniority* are less than offers in *Die Roll*

(v) We fail to reject the null hypothesis in H^5 that the offers in *Die Roll* are the same the as offers in *Unannounced* and

(vi) We fail to reject the null hypothesis that offers in *Quiz* are equal to the offers in *Seniority*.[11]

In addition, we test the overall offer distribution from each treatment against the offer distribution from the other three using the Kolmogorov-Smirnov test.[12] Table 5 reports the test statistics, followed by the critical values given in parentheses. The only two differences in offer distributions are between *Die Roll* and *Seniority*, and between *Unannounced* and *Seniority*.

[11] We note that the sense of merit established in *Quiz* is slightly different than that in *Seniority* because the subjects in *Seniority* have a clearer sense of their rank. The students know the exact number of credit hours that they have personally accumulated, so they can estimate their position in the ranking more precisely than those in *Quiz* can. However, there is no evidence from Spearman's rank correlation coefficient to suggest that this added information affects the offers in *Seniority* (r_s, $= -0.086$, $p > 0.25$). Spearman's rank correlation coefficient relating offers in *Quiz* to subjects' quiz scores is $r_s = 0.308$ ($p > 0.15$).

[12] Both sample sizes should be greater than 25 to be considered large for the Kolmogorov-Smirnov test.

Table 4. Pairwise Wilcoxon Rank Sum Tests

	Unannounced	*Die Roll*	*Quiz*	*Seniority*
Unannounced		0.412[a]	0.037[a]	0.005[a]
Die Roll			0.047[a]	0.008[b]
Quiz				0.277[b]
Seniority				

[a] One-tailed.
[b] Two-tailed.

Table 5. Pairwise Kolmogorov-Smirnov Tests

	Unannounced	*Die Roll*	*Quiz*	*Seniority*
Unannounced		50 (176)[a]	132 (176)[a]	212 (176)[a]
Die Roll			132 (176)[a]	198 (198)[b]
Quiz				88 (198)[b]
Seniority				

The test is significant if the test statistic is greater than or equal to the critical value.
[a] One-tailed.
[b] Two-tailed.

4. Discussion

We find that the median offers in *Seniority* and *Quiz* are both significantly less than those in *Die Roll* and *Unannounced*. The comparative cumulative frequency distributions in Figure 5 distinctly illustrate the two observed pairings among our four treatments: *Seniority* with *Quiz*, and *Die Roll* with *Unannounced*. The median offers are statistically different across the pairs, but there is no difference within them. Recall that we designed these treatments to be distinguished along two dimensions: the presence or absence of a fair procedure and the presence or absence of a meritorious ranking. With this in mind, we find that the meritorious ranking is the only dimension that organizes these data, not the fair procedure.[13] From this, we draw two conclusions: (i) Justice and fairness are distinct concepts in a DG; and (ii) justice, not fairness, legitimizes the dictators' property rights to the endowment.

We hypothesized that the *Seniority* and *Die Roll* treatments would be different, indicating an operational distinction between just deserts and fair procedures. However, by failing to reject the null hypothesis that offers in *Die Roll* are equal to offers in *Unannounced*, we unexpectedly find that an explicit fair procedure has no behavioral impact on the generosity of dictators. This does not mean that a fair procedure is irrelevant to a dictator's offer, but that an explicitly defined procedure does not legitimize the property right any more than the unstated assignment of the right does. Indeed, the subjects appear to trust that the experimenter will meet their expectations of fairness with an impartial experimental procedure. Yet this insight still does not explain why a fair procedure (explicit or implicit) does not do more to legitimize the dictator's property right when, in reality, it is common to use a fair procedure, for example, a coin flip, to determine everyday allocations. Our failure to observe the impact of a fair

[13] In note 9 we report that there is no gender difference in the offers made in any single treatment. If we combine the data from the two treatments with merit, *Seniority* and *Quiz*, we find that the men do offer significantly less to their counterparts using a two-sided Wilcoxon rank-sum test (p-value = 0.0236). However, we find no gender effect when we similarly combine and test the data from the two fair procedure treatments, *Unannounced* and *Die Roll* (p-value = 0.6480).

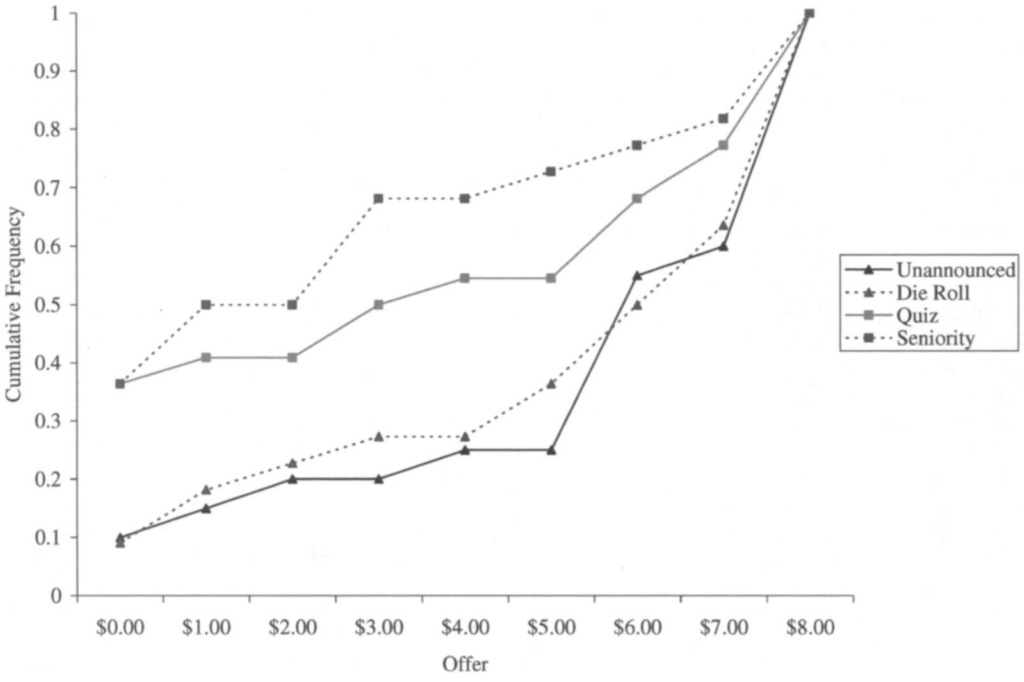

Figure 5. Cumulative Frequency Distributions by Treatment

procedure in *Die Roll* and *Unannounced* perhaps reminds us of the peculiarity of the DG. How often do we unilaterally allocate windfall endowments between ourselves and another person in everyday life? Or perhaps subjects arrive at the laboratory with normative notions of how the monitor will treat them and so regard the *Unannounced* treatment as an inherently fair procedure for random recruits. This restricts its use as a baseline and, in turn, limits our understanding of the effects of a fair procedure. Despite this uncertainty surrounding fairness in the DG, when deciding an allocation in a laboratory, we find that meritorious rankings and not fair procedures legitimize a dictator's property right.

Appendix A: Background

In this appendix we discuss justice and fairness as separate social concepts.

Justice

The meaning of justice has been a major topic in philosophy for millennia. We will not engage in a metaphysical debate and will instead discuss the less controversial aspects of this elusive concept. We begin with the semantic component of justice that dictates that everyone receives what he or she deserves. Though justice can be applied to court cases (retributional justice) or to the allocation of scarce resources (distributive justice), this article focuses on distributive justice applied to allocations. Closely associated with justice is the concept of desert, which we implement in our experiment as a claim of ownership; that is, a property right that any reasonable person would agree is legitimate. The way in which one substantiates a claim distinguishes one type of just reward from another: A demonstration of greater ability or achievement is the basis for merit-based desert, while a fair procedure or demonstration of greater need may be the basis for non–merit-based desert. This distinction is important because the concept of justice exclusively relates to merit-based desert, as merit is the only criterion that can be externally evaluated and rewarded by an accepted authority. When reward exactly corresponds to merit-based desert, we will refer to it as just reward. In a courtroom this authority is a judge upholding the law; in an experiment it is the monitor imposing some measure of desert. In contrast, other bases

for desert are best enforced internally because they may vary according to the participants' personal views and/or the context of the allocation.

In any form of justice, if one person does not receive his or her just reward, then justice has not been done. Therefore, determining each party's relative desert precedes any just reward. Such a task is not easily accomplished, especially when allocations are among many individuals. One solution to this problem is the veil of ignorance, which serves as a method of impartially calculating just rewards (Rawls 1971). Behind the veil of ignorance, in what Rawls calls the original position, no one is aware of his own incentives, and so has no tendency toward selfish behavior. By analyzing all the relevant information in the aggregate, without self-regard clouding one's judgment, logical reasoning can deliver the just outcome through objective comparison of each party's desert.

Kaufmann (1973) challenges the very idea of justice, arguing that it is purely vindictive by nature and serves no purpose other than to make those who do wrong suffer in turn. His argument is based on the idea that desert, and thus any just reward, is unknowable because there is no way to objectively identify and evaluate all relevant criteria. Kaufmann puts forward the example of college admissions. He says that there is no such thing as justice in allocating college acceptances because there are too many variables to consider. Even if a core of universally agreed upon criteria existed, every person involved would then have to independently agree upon the correct weight each criterion should be given in the formula for desert. Such a formula could not be derived through reason as Rawlsian thinking would prescribe. Thus, because we cannot know the infinite range of variables that might pertain to a certain allocation problem, and neither can we know the relative amount of attention each requires in a rational formula, the veil of ignorance is not a practical concept.

Kaufman's critique aside, people still meaningfully and effortlessly use "justice" in everyday conversation with the implicit understanding that a just outcome is merely a close approximation to what Kaufmann would call flawless justice with complete knowledge. Our goal here is to choose a set of procedures for a specific laboratory experiment to invoke just rewards, regardless of whether one's own view of justice ranges from Rawls's to Kaufman's.

Fairness

While justice can be thought of as a hierarchical approach to an allocation in which there exists a proper allocation pattern based on each party's relative desert, fairness, in contrast, is egalitarianism applied to the same problem (McCloskey 2006). The word "fair" is often used to connote equity, but this glosses over what exactly is equal—equal wealth, equal reward for equal effort, equal opportunity, equal welfare, etc. (Hoffman and Spitzer 1985). As Hoffman and Spitzer (1985) note, equal reward for equal work is independent of actual achievement, which distinguishes it from justice and merit. The concept is related to equity theory and Lockean theory, which posit that desert is proportional to the amount of effort one expends in pursuit of a goal.

Recent work by Wierzbicka (2006) indicates that the origins of the word "fair" suggest that its use pertained to the rules of the game. She observes that fairness, unlike justice, is done *with* others. For example, a teacher is considered fair only when others view him as such. He would not be fair if he gave all of his students failing grades because others would say that he was too demanding. This is because the cooperation between students and teachers in the learning process entails a social consensus on appropriate behavior based on what they and those around them perceive as right or moral. A judge, on the other hand, is just when he upholds the law, regardless of what the convicted criminals think of their punishments. The law serves as the social consensus, providing an authoritative guide to acceptable behavior and eliminating concern over what others might think is right. Hence, justice is done *to* others, not *with* others.

The original antonym of "fair" was not "unfair," but "foul" (think fair and foul balls in baseball). Thus, the context of the situation dictates which meaning we are referencing. It is important to note which meaning is being used, for these different situations commonly elicit different expectations of a "fair" outcome. For instance, *equal opportunity* can be the basis for an inequitable allocation, while *equal reward* always assumes equal desert and divides the resource equitably. Because of this possible disparity between any two "fair" outcomes, it is essential to clarify which type of fairness we mean when we discuss it out of context.

One way to describe the relationship between the different uses of "fair" is to think of each as an alternative to any other. That is to say when there is not a reasonable way to determine desert objectively, an equal sharing of the resource is an agreeable alternative. Likewise, when social norms or institutions allow and/or encourage a different method, it is acceptable to replace the default assumption of equal desert with a fair procedure that assesses everyone's desert on the basis of some criteria, such as need or effort, that are built into the agreed upon rules. As an example, Bolton and Ockenfels (2000) find that an entitlement stage that provides equal opportunity is an "acceptable substitute" for an even split of the endowment in the DG.

In recent economic research, a fair procedure is most often thought of as a randomization process, but this addresses only the use of the word "fair" that relates to equal opportunity. In reality, randomization is not necessary in a fair procedure if everyone agrees to abide by the rules put forth in, say, a social contract. Everyone involved in the fair procedure must agree upon these rules, making any resulting assessment of just reward valid. Knowing this, people will

design the fair procedure to reflect their expectations of which criterion—need, effort expended, etc.—should be considered.

To clarify what we mean by a fair procedure, take, for example, two students eyeing the last piece of pizza. Each method of allocating the pizza is acceptable, but the context will determine which one is preferred. A *fair outcome* might give each student half of the slice. A *fair procedure* would involve

(i) Identifying some criteria for desert, such as need (as in hunger)

(ii) Measuring the desert and then

(iii) Dividing the pizza according to each person's just reward, thereby delivering a suitable alternative to an equitable allocation.

(It is assumed that, at the beginning of the fair procedure, neither person can know who is the more deserving and, therefore, cannot capitalize on any initial advantages they may have because they are unaware of them.)

Now, it is important to explicitly outline the requirements of a fair procedure. A procedure is fair only if no one can legitimately protest the process or the result. A legitimate protest is one that proves that the rules of the procedure gave an unagreed upon or unforeseen advantage to one party over another in a way that undermined the integrity of the process. As an extension, it is the responsibility of each party to contribute their personal information while the rules are being discussed so that protests can be avoided. Anything less than full disclosure that results in asymmetric information is unfair, but as long as everyone shares the same communal knowledge, imperfect information is not grounds for protest because it does not give an advantage to one person over another.

In the example of the last slice of pizza, it is initially impossible to say which one deserves the last piece. Let us say that in order to solve this problem, the two agree to use hunger as the only criterion. Without any other means of measuring hunger, the fair procedure hinges on their honesty in representing their personal hunger levels. After their hunger levels are revealed, they use that information to create a social balance that serves as a pattern for the allocation. Their only grounds for protest are (i) that the allocation pattern was not met because someone took too much, (ii) that the other was not honest in revealing his hunger, or (iii) that there was some component of the procedure that was not explicitly agreed upon.

Appendix B: Experiment Instructions

This is an experiment in economic decision making. Each of you will be paired with another person in this room. One of you will be person A, and the other will be person B. You will not be told who your counterpart is either during or after the experiment, and he or she will not be told who you are either during or after the experiment.

The experiment monitor has allocated **$16** to each pair. An A will decide how to divide the **$16** between A and his or her counterpart B.

Notice that being an A is a definite advantage in this experiment.

[***Unannounced:*** You will know if you are an A or a B once everyone finishes reading the instructions.]

[***Die Roll:*** The positions of A and B will be determined by a *roll of a die*. Everyone must click on one of the two buttons that are labeled **Even** and **Odd**. The buttons will appear at the bottom right corner of your screen as soon as the experiment begins. You will not be able to click on a button if your counterpart has already clicked it.

The monitor will roll a six-sided die at the front of the room and will announce the result aloud. A roll of 1, 3, or 5 is **Odd**, and a roll of 2, 4, or 6 is **Even**. There is an equal chance of the roll being odd or even. The person in each pair who called the actual roll of the die will be an A, and the other will be a B.]

[***Quiz:*** The positions of the A and B will be determined by *ranking your scores on a quiz on Mason trivia*. Each of you will be asked the same set of 10 questions. The experiment monitor will rank the quiz scores with ties decided by giving a higher ranking to the person who finishes the quiz in the shortest amount of time.

The lower-ranking half will be the Bs, and the higher-ranking half the As. The highest-ranked A will be matched with the lowest-ranked B, the second highest-ranked A with the second lowest-ranked B, etc.]

[***Seniority:*** The positions of A and B will be determined by *seniority*. The experiment monitor will determine seniority by ranking the total number of credit hours completed and in progress for each participant. Ties will be broken randomly.

The lower-ranking half will be the Bs, and the higher-ranking half the As. The highest-ranked A will be matched with the lowest-ranked B, the second highest-ranked A with the second lowest-ranked B, etc.]

Each A will fill out a form on the computer that consists of the amount that A will receive and the amount that B will receive. If you are an A, you will type an amount in the box labeled "Your Earnings." The amount that B receives will immediately be shown in the box labeled "B's Earnings." Once an A is satisfied with the decision, he or she must click the Submit button and confirm the decision.

When all of the As have confirmed their decisions, the results will be displayed to their counterparts. Payment will take place after the experiment, and it will be private.

If you are ready to begin and agree to continue under these rules, please enter your name and click the button that says "I Agree." If you do not wish to continue, you may choose to leave now with your $7 for showing up on time.

You may not leave after the experiment has begun.

If an odd number of people decide to leave, one more person will be randomly selected to receive $16 and will be allowed to leave at this time, as well.

Appendix C: Experiment Screenshots

Figure 6. The Instructions Screen with "I Agree" and "Leave Now" Buttons

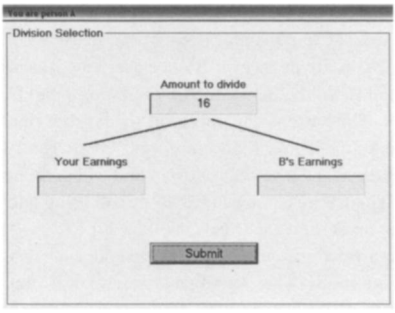

Figure 7. The Basic Interface for Player A

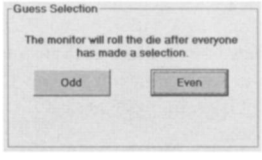

Figure 8. The Guess Selection Screen during the Entitlement Stage of *Die Roll*

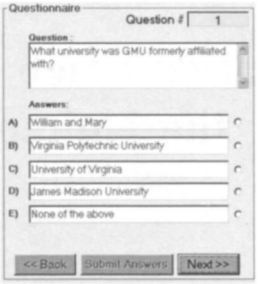

Figure 9. The Quiz Screen during the Entitlement Stage of *Quiz*

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