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James Konow

Loyola Marymount University, jkonow@lmu.edu

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Fair and square: the four sides of distributive justice

James Konow*

Department of Economics, Loyola Marymount University, 7900 Loyola Boulevard, Los Angeles, CA 90045, USA

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Abstract

Recent theoretical progress on *inequity* has left unresolved the crucial question of what constitutes *equity*. This paper proposes a positive theory of distributive justice, in a framework of inequity aversion, that depends on three general justice principles and context. The current study challenges the view of many previous inquiries that justice is *context-specific* and instead advances a theory in which justice is *context-dependent*: context matters, not because of the lack of general principles of justice, but due to its effect on the interpretation of those principles. Results from telephone interviews and written questionnaires are presented in support of the theory. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

Issues of fairness, justice or equity (terms I will use interchangeably) surface frequently in the economic, political, familial, social and religious domains of everyday life. What is remarkable, and perhaps unique, about justice is that, despite the strong sentiments and vigorous actions it incites, no consensus has emerged about what it is. Within the economics literature, the mounting, and now abundant, evidence of its impact on experimental outcomes, naturally-occurring markets and public policy has prompted various theories of fairness (e.g. Fehr and Schmidt, 1999; Rabin, 1993). These models are important advances that provide insight into how individuals may respond to different (beliefs about) allocations vis-à-vis some fair value, but they leave unanswered and untested the crucial question of how, in general terms, the fair value is established. Such a concept would be helpful in understanding the role that fairness does take, and perhaps should take, in enumerable

* Tel.: +1-310-338-2956; fax: +1-310-338-1950.

E-mail address: jkonow@lmu.edu (J. Konow).

economic domains, such as in the regulation of industries, salary negotiations, labor strikes, public policies in response to claims of price gouging and informal exchange based on reciprocity. This paper proposes a theory of how fair values are determined and presents evidence from telephone interviews and written questionnaires in support of that theory.

The comments of two leading equity scholars cited below provide examples of the wide disparity of views of what determines fair outcomes.

Equity is a complex idea that resists simple formulations. It is strongly shaped by cultural values, by precedent, and by the specific types of goods and burdens being distributed. To understand what equity means in a given situation we must therefore look at the contextual details [H. Peyton Young, *Equity: In Theory and Practice*, 1994, p. xii].

The complete principle of distributive justice would say simply that a distribution is just if everyone is entitled to the holdings they possess under the distribution [Robert Nozick, *Anarchy, State, and Utopia*, 1974, p. 151].

Young draws a conclusion shared by many behavioral and social scientists who investigate what might be called *experiential justice*, or justice as revealed in the words and actions of people in real life experiences. These positive (or descriptive) studies often view fairness as a context-specific phenomenon that defies generalization. A few of the many significant contributions in this vein are Elster (1992), Greenberg (1996), Walzer (1983) and Young (1994). Nozick, at the opposite extreme, is representative of many moral philosophers and some welfare economists whose subject matter is *notional justice*, or justice in highly abstract and theoretical terms. They seek to define normative (or prescriptive) theories of justice, as in the works of Aristotle (1976), Baumol (1986), Nozick (1974) and Rawls (1971). Unfortunately, normative theories of justice seem almost as numerous as the fairness contexts identified by social scientists.

The current study belongs to a third group that integrates experiential and notional justice and includes contributions such as Berkowitz and Walster (1976), Isaac et al. (1991), Kahneman et al. (1986b) and Zajac (1995). The goal of this paper is to describe *experiential justice* in *general* terms, that is, to fashion a positive theory of justice. Specifically, it addresses *distributive justice*, which concerns the final allocation of economic rewards and responsibilities, as opposed to *procedural justice*, which concerns just processes and may include consideration of intertemporal choice and uncertainty that are not addressed here. This study has characteristics in common with inquiries in both the Young and the Nozick genres. The theory advanced attempts to account for the fairness views of a majority of people based on well-behaved preferences over three general justice principles: accountability, efficiency and needs. In evaluating fairness in specific situations, however, one has to make interpretative decisions about context, for instance, one has to choose to which people and variables to apply the justice principles. Thus, the proposed theory claims that experiential justice, like a square, has four sides: three general equity principles and context.

One of the justice principles, the Accountability Principle, plays a prominent role in the theory. This principle, which was introduced in Konow (1996), calls for allocations to be in proportion to volitional contributions, e.g. a worker who is twice as productive as another should be paid twice as much if the higher productivity is due to greater work effort but not if it is due to innate aptitude. This study extends the Accountability Principle from

distributions to transactions and from single to alternative distributions or transactions. Here we also follow the suggestion in the concluding remarks of Konow and formulate a more general theory of justice that rests not only on the Accountability Principle but also two additional rules: the Efficiency Principle and the Needs Principle. Whereas the Accountability Principle deals with the relative size of allocations across individuals, the Efficiency Principle is concerned with the absolute size of allocations, roughly speaking, with maximizing allocations. According to the Needs Principle, a just allocation is simply one that is sufficient to meet each individual's basic requirements for life. This triad of justice principles was originally inspired by a conjecture of Frohlich and Oppenheimer (1992, 1994). After examining the selection of distributional rules in an experimental setting, they speculate that people balance three competing claims similar to those proposed in this paper: just deserts, need and incentives for productivity. Nevertheless, they do not work out this conjecture in any detail, either theoretically or empirically. This paper attempts to define three justice principles in clear and general terms, to develop a theoretical framework that describes how they are balanced against one another and to produce evidence on each of the principles and on the trade-offs between them.

Note that the pursuit of one principle may coincide or conflict with the pursuit of another, depending on the context. For instance, a productivity-based pay system may satisfy both the Accountability Principle by rewarding harder workers as well as the Efficiency Principle by promoting the greatest total output. On the other hand, that same pay system may conflict with the Accountability Principle if productivity differences are due more to differences in innate ability than in work effort or with the Needs Principle if efficient compensation is insufficient to meet the basic needs of some workers. When justice principles do conflict, one must judge the relative importance of each. This study proposes and finds evidence to support an inequity aversion model for determining trade-offs based on preferences for each of the three principles.

Finally, this paper seeks to clarify the role of context in distributive justice. As mentioned earlier, one school of thought claims that justice is *context-specific*, that is, that there are no general equity rules and that fairness varies across contexts. Instead, this study proposes that experiential justice is *context-dependent*: context matters, not because of a lack of general principles of justice, but due to the impact of context on the interpretation and application of general principles. One aspect of context is how it affects the relationships among variables, such as the question of whether the pursuit of one justice principle coincides or conflicts with the pursuit of another, as in the pay system example above. Under the rubric of context, however, our discussion will focus on *contextual effects*, i.e. how justice evaluation varies with the "stated context", e.g. with the information provided about people and variables. For example, applying even a single justice principle, person A's salary may be judged fair when compared to person B's but not when compared to person C's.

This study takes distributive justice as a goal of economic agents, but that does not mean it is the sole goal. Individuals may also be motivated by other concerns, such as self-interest and reciprocity, that can confound inferences about justice from observations of behavior. Several recent papers (e.g. Konow, 2000; Babcock and Loewenstein, 1997) report the results of experiments in which personal stakes introduce an egocentric bias into fairness judgments. To understand the interaction of these forces, it is necessary to know what each force is, and this paper attempts to isolate unbiased justice. Rawls refers to this as justice behind a "veil of

ignorance”, i.e. in an idealized state in which parties do not know how the alternatives will affect their particular case. Partly out of this concern, a survey format was used involving hypothetical scenarios that were deliberately remote from the personal circumstances of most respondents. An attempt was made to keep the details of the scenarios simple and to focus on specific principles or contextual effects, usually one at a time, while neutralizing, minimizing or holding constant self-interest and the other principles and effects. A technique often employed was that of contrasting questions, which present similar vignettes that differ only with respect to some aspect that is relevant to a given justice principle or contextual effect. Some of these questions are identical except for the value of a parameter that measures the degree of support for a principle.¹ Because individuals value and interpret justice principles differently, survey questions are not expected to generate unanimous responses. This paper sets a criterion for justice principles based on tests of proportions: a justice principle is a rule that accords with the equity standards of a statistically significant majority of the population based on sample responses to a battery of questions, *ceteris paribus* (i.e. holding context and other justice principles constant).

The results are drawn from a database currently containing the responses of 3178 subjects to various surveys of the author. The surveys include telephone interviews of Los Angeles area residents and written questionnaires of students at Loyola Marymount University (LMU). In order to promote attentive responses, the telephone interviews lasted no more than 5 min and contained only five questions. For similar reasons, the written questionnaires lasted no more than 10 min and contained no more than eight questions, and sometimes only three, where the number of questions depended on the length and complexity of the scenarios.²

This paper is organized as follows. Section 2 presents theory and evidence on the three principles of distributive justice and on fairness preferences. The role of context is explored further in Section 3, and Section 4 contains some concluding remarks.

2. Fairness principles and fairness preferences

The theory is best illustrated first with a hypothetical situation stripped to the contextual essentials, in this case, the “castaway” scenario, which is later supplemented by numerous other scenarios closer to everyday experience. The thought experiment is reminiscent of the Crusoe and Friday paradigm sometimes employed to introduce general equilibrium theory.

¹ Contrasting questions were never posed to the same subjects so as to avoid any possible interactions such as a tendency to change answers to a different versions of the same question or, perhaps, the opposite tendency to keep answers the same. Although presumably less serious, interactions are also conceivable between questions involving different scenarios. For this reason, there were numerous versions of the surveys that combined different subsets of questions from the master list, and, to control for order effects, questions were usually presented in a Latin square design.

² Other details about the surveys can be found in Konow (1996). Although additional results have been collected subsequently, the details described there remain essentially the same. This includes the facts that the sample populations were culturally diverse and that similar questions posed to the Los Angeles and LMU populations yielded consistent results across the two populations. Of the 44 survey results reported in this paper, the only previously published ones are *IA*, *IB*, *IC* and **8A** from Konow (**8A** has been renumbered to **4A** here to maintain proper sequencing in this paper) and *11B* (originally *2B*) from Kahneman et al. (1986b).

At issue are two castaways shipwrecked on an otherwise uninhabited island and the fair allocation to them of the only available food, bananas. The castaways are the two obvious *members* for the relevant *reference group*, or the set of persons whose allocations are being evaluated. As stated in the introduction, the theory is interested in the fairness views of an unbiased *observer*, for example, an objective survey respondent evaluating the fairness of a castaway scenario. The *entitlement* of a member is his or her just allocation in the view of a typical observer, for example, a castaway's fair quantity of bananas in the judgment of a statistically significant majority of survey respondents.

An observer's utility is assumed to be a function of the difference, say, for member i , between i 's actual allocation, denoted y_i , and his or her entitlement, denoted η_i . Similar to Konow (2000), let this be represented by an inequity aversion term, $-f(y_i - \eta_i)$, that is strictly concave and has a maximum at $y_i = \eta_i$.³ In other words, as the difference between a person's allocation and entitlement increases, a survey respondent's disutility and marginal disutility increase (in absolute value terms). Additional aspects of inequity aversion (or the preference for fairness) will be discussed as we go along. For now, the important point to note is the assumption made in this paper that the greater the difference between a member's allocation and his or her entitlement, the larger the fraction of observers who will judge the allocation unfair.

2.1. Accountability principle

The Accountability Principle is related to various social psychology theories including equity theory (e.g. Homans, 1958; Adams, 1965; Walster et al., 1973) and attribution theory (e.g. Hoppe, 1931; Heider, 1958; Crandall et al., 1965; Rotter, 1966; Weiner and Kukla, 1970). The relevant concepts may be illustrated using the castaway example. According to the Accountability Principle, the entitlement depends on the perceived *output* or production of the allocable variable, e.g. bananas collected for eating, and the member's perceived *input* to the production, e.g. a measure of the castaway's contribution to the available bananas, perhaps his labor time or the number of bananas he collects. Specifically, observers use relative inputs to determine the just allocation of output by attempting to distinguish *discretionary* from *exogenous* variables. A discretionary variable is one that affects production and that the member can influence, e.g. the castaway's work effort. An exogenous variable is one that the person cannot reasonably influence but that may nevertheless have an impact on output, e.g. one castaway's congenital condition such as a missing hand since birth.

The Accountability Principle may now be more formally stated as follows.

ACCOUNTABILITY PRINCIPLE: "*The entitlement varies in direct proportion to the value of the member's relevant discretionary variables, ignoring other variables, but does not hold a member accountable for differences in the values of exogenous variables.*"

In other words, a person's fair allocation is proportionate to the variables he controls. For instance, a castaway whose work effort is twice that of his cohort deserves twice as

³ That is, assuming f is twice continuously differentiable, $f'(0) = 0$, and letting $w_i \equiv y_i - \eta_i$, $w_i \neq 0$, $f'(w_i)w_i > 0$ and $f''(w_i) > 0$. In scenarios with only two members (persons or groups) such as those presented in this paper, one can generally focus on the unfairness to just one of them since too little to one usually implies too much to another.

Table 1

Question 1

<i>IA.</i>	<i>Bob and John are identical in terms of physical and mental abilities. They become shipwrecked on an uninhabited island where the only food is bananas. They can collect as many bananas as they want by climbing up a tree, picking them before they fall into the ocean and throwing them into a pile. In this way Bob picks 12 bananas per day and John picks 8 per day. Bob takes from the pile the 12 bananas he picked leaving John with the 8 that John picked. Please rate this as:</i>
	Fair 74% Unfair 26% $N = 76, P < 0.001$
<i>IB.</i>	<i>... become ... Bob and John are identical in terms of physical and mental abilities except that Bob was born with one hand and John with two. Together they pick a total of 20 bananas per day, but because of his condition Bob picks fewer bananas per day than John. John takes 12 bananas from the pile leaving 8 for Bob. ...</i>
	Fair 19% Unfair 81% $N = 78, P < 0.001$
<i>IC.</i>	<i>... become ... Bob and John are identical in terms of physical and mental abilities except that Bob was born with one hand and John with two. Together they pick a total of 20 bananas per day, but because of his condition Bob picks fewer bananas per day than John. John takes 10 bananas from the pile leaving 10 for Bob. ...</i>
	Fair 90% Unfair 10% $N = 78, P < 0.001$

many bananas. Nevertheless, the entitlement ignores other variables, even if they affect output. For example, two castaways who are equally hardworking deserve equal numbers of bananas, even if one of them is less productive than the other because of a missing hand. Thus, individuals are only held accountable for factors they may reasonably control.

Table 1 features three versions of question 1, which presents the castaway scenario to subjects in written form.⁴ Here inputs, bananas picked, and output, bananas available for eating, are measured in the same units. In version A of this question, there are no explicit exogenous differences, and the only differences in inputs are due to a discretionary activity, picking bananas. Thus, each person's entitlement is proportional and equal to his contribution. The results confirm this: from a sample (N) of 76, 74% of the subjects judge this fair and 26% unfair. The level of significance (P) results from a simple test of proportions that a majority of the population would respond as has the majority of the sample, i.e. we can conclude that more than 50% of the population would also select "fair" to this question at better than the 0.1% level of significance, i.e. $P < 0.001$.⁵

Question 1A contains both the stem of question 1, which is the same for all versions and is in regular type, as well as the variations, which differ across versions and are denoted in italic. For the remaining versions, the table presents only the italicized variations. Question 1B is a contrasting version in which the difference in bananas picked is due to one castaway's being born with only one hand instead of two. The same 12/8 split favoring the more productive two-handed castaway is now deemed unfair. Question 1C is identical to 1B except that Bob and John both receive 10 bananas. In 1B and 1C perceived discretionary variables are equal implying that unequal allocations are unfair and equal allocations fair. For purposes

⁴ Version A of question 1 is denoted 1A. Questions from the written questionnaires are set in italic, e.g. 1A, whereas those from the telephone interviews are set in bold, e.g. 3A.

⁵ The P -values reflect one-sided tests of whether one value is greater than another except where two-sided tests of differences between values are explicitly noted.

of justice, the explicit exogenous difference is irrelevant to most observers, even though it has an impact on output.

The entitlement may be expressed as a formula consisting of three terms that incorporate inputs, outputs, endowments and costs. The first term of this formula is the endowment term. Member *i*'s *endowment*, denoted e_i , is that person's portion of the allocated variable that is unrelated to any productive or merit-based activity, e.g. this includes any bananas that just happen to fall from a tree into a castaway's possession. Since this is all exogenous, the Accountability Principle calls for each person to receive equal shares of the total endowment in the reference group regardless of that individual's personal endowment, or

$$\frac{\sum_{i=1}^n e_i}{n} \tag{1}$$

where $\sum_{i=1}^n e_i$ is the total endowment and n the number of members of the reference group.

The second term of the entitlement formula is the production term, which pertains to the allocation of output, e.g. of the bananas picked from the trees. The output of member *i*, e.g. the bananas generated through *i*'s climbing and picking, is denoted q_i . The fair costs borne by *i* for contributing to production are denoted c_i , e.g. the *incremental* bananas a castaway consumes because of the additional energy expended climbing trees and picking bananas. Therefore, *i*'s output net of fair costs equals $q_i - c_i$, and for the group this equals $\sum_{i=1}^n (q_i - c_i)$. According to the Accountability Principle, a fraction of this group total should be allocated to *i* in proportion to the discretionary component of *i*'s input. Nevertheless, *i*'s input, $x_i(\varepsilon_i)$, is also a function of his *resource endowment*, ε_i . The resource endowment (not to be confused with e_i) consists of the exogenous personal resources of *i* relevant to production, for instance, *i*'s innate climbing, picking and sorting skills, which should not affect a member's allocation. Therefore, one employs an adjusted input, \hat{x}_i , which excises the exogenous component and isolates the discretionary component of the input.⁶ Then *i*'s merit, or his contribution to production adjusted for exogenous factors, relative to that of all members is $\hat{x}_i / \sum_{i=1}^n \hat{x}_i$. The production term allocates this fraction of the total output net of fair costs to *i*, or

$$\frac{\hat{x}_i}{\sum_{i=1}^n \hat{x}_i} \sum_{i=1}^n (q_i - c_i). \tag{2}$$

This is consistent with the results to questions *IA*, *IB* and *IC* above. With equal resource endowments in *IA*, adjusted inputs equal actual inputs and fair allocations are in proportion to these. Actual inputs differ due to an exogenous difference in *IB* and *IC*, but adjusted inputs are equal and, assuming equal fair costs, both are entitled to equal numbers of bananas.

The third and final term of the entitlement formula is simply fair costs, c_i . Results to earlier surveys suggest that fair costs, or costs that observers consider fair to reimburse, are not necessarily opportunity costs or incurred costs. Rather, they are costs that can be reconciled with the Accountability Principle: a producer is expected to benefit or suffer from cost differences vis-à-vis its cohorts according to its accountability for those differences,

⁶ For simplicity, we focus on cases when differences in inputs are all discretionary, in which case $\hat{x}_i = x_i$, or are all exogenous, in which case $\hat{x}_i = \sum_{i=1}^n x_i / n$.

Table 2
Question 2

2A. Davis and Thompson have restaurants in a shopping mall. Davis owns a video game machine with which he breaks even: it costs US\$ 40 per week to maintain and, in Davis' restaurant, generates US\$ 40 per week in revenue. In Thompson's restaurant maintenance costs would still be US\$ 40 but, because of the younger clientele there, weekly revenue would be US\$ 80. Davis decides to rent the video game machine to Thompson and continues to pay for the US\$ 40 weekly maintenance costs. Please circle the weekly rent that you consider fair for Davis to charge Thompson.

- | | | |
|---|---------|-----|
| A | US\$ 50 | 28% |
| B | US\$ 60 | 62% |
| C | US\$ 70 | 10% |

$N = 135, P = 0.002$

2B. ... costs. Because Davis is related to the owner of the mall, he got a much more favorable location, and solely for that reason Davis runs a highly profitable business whereas Thompson operates on a very small profit. Please ...

- | | | |
|---|---------|-----|
| A | US\$ 50 | 48% |
| B | US\$ 60 | 48% |
| C | US\$ 70 | 4% |

$N = 131, P = 0.669$

implying it should be comparably efficient and internalize all costs from its production. Adding this term to the other two produces a formula for η_i^a , person i 's entitlement according to the Accountability Principle

$$\eta_i^a = \frac{\sum_{i=1}^n e_i}{n} + \frac{\hat{x}_i}{\sum_{i=1}^n \hat{x}_i} \sum_{i=1}^n (q_i - c_i) + c_i. \quad (3)$$

Various additional questions examine these terms individually and jointly and yield consistent majority responses in support of the formula (see Konow, 1996).

In question 1, the Accountability Principle is applied to the *distribution* of a given variable to members of a reference group. This study extends the Accountability Principle to situations involving *transactions* among members, e.g. between buyers and sellers of goods or between employers and workers, whereby one derives a theory of the fair terms of transaction, or "just price". In voluntary transactions, nonnegative (to make it interesting, let us say positive) surplus is created. Ceteris paribus, a just price produces a just division among transactors of this surplus. Consider question 2A in Table 2. Viewed as a nonproductive transaction, the production term disappears from the entitlement formula and each restaurant owner deserves US\$ 20, or one-half of the US\$ 40 of surplus generated with the machine in Thompson's restaurant, plus Davis is compensated for his US\$ 40 of fair costs for maintenance. Thus, the just price, or the seller's gross allocation, is a rent of US\$ 60, consistent with the choice of a significant majority of respondents.⁷

⁷ Alternately, if the transaction is viewed as productive, the endowment term falls away, output equals revenue and the revenue net of fair costs is allocated in proportion to the transactors' adjusted contributions to the transaction. When adjusted inputs appear equal, as here, the productive and nonproductive approaches lead to the same conclusion.

In previous work on accountability (Konow, 1996, 2000), subjects responded to the fairness of a single allocation. Sometimes, however, observers are confronted with different distributions or transactions and must decide what weight to place on the alternative allocations. For example, version *B* of question 2 is identical to *A* except that respondents are provided with additional information about the protagonists' profits, not only from the video game machine, but also from their restaurant businesses. Accountability in the restaurant business implies that Davis's higher profit there is unfair since it is attributable to an exogenous variable, namely his serendipitous relation to the mall owner. Accountability in the video game business implies, as discussed above, a rent of US\$ 60. If accountability for the restaurant profits is shifted onto the rental profits, however, we would expect a lower rent in order to help equalize unfair restaurant profits. Choices *A* and *B* are tied in question 2*B*, but in comparing the differences in answers from 2*A* to 2*B*, there is a statistically significant shift toward a rent of US\$ 50 and away from US\$ 60 ($P < 0.001$ and $P = 0.010$, respectively). These results suggest a trade-off between fairness in alternative allocations.

2.2. Efficiency principle

Efficiency captures a concern about the total size of the allocable variable. In this case, the entitlement is determined based on efficiency, not accountability. As before, the preference can be modeled as an aversion to a deviation of the actual allocation from the desired one. If two or more principles conflict, however, the preference function must be generalized. Letting η_i^e represent member *i*'s entitlement according to efficiency, the preference function of an observer becomes $-f^a(y_i - \eta_i^a) - f^e(y_i - \eta_i^e)$, where f^a and f^e are inequity aversion terms for accountability and efficiency, respectively. These terms are assumed, as before, to be strictly concave with maxima where the allocation and their respective entitlements are equal. When $\eta_i^a \neq \eta_i^e$, these assumptions imply a trade-off between accountability and efficiency whereby the importance of a given principle rises with the inequity associated with that principle.

The surveys produce implicit and explicit, general and specific evidence of a concern for efficiency that is consistent with this characterization of observer preferences. Question 3 in Table 3 is a variation on the castaway scenario of question 1 that was presented to telephone, rather than written, respondents. All versions have John taking 12 bananas and leaving Bob with 8 but differ with respect to how many more John picks than Bob due to different resource endowments. In version **A**, John picks 14 and Bob only 6, in **B** John picks 16 and Bob 4 and in **C** John picks 18 and Bob 2. All results accord with the Accountability Principle, which considers the exogenous differences in inputs irrelevant, even when the differences are great. Nevertheless, there is a significantly lower level of opposition to the modest inequality in allocations in comparing version **B** with **A** ($P = 0.021$) and version **C** with **B** ($P = 0.047$). This raised the suspicion that respondents consider other factors, perhaps that failure to reward John for his higher productivity might reduce his incentive to pick bananas and, therefore, reduce the total.⁸

⁸ Remember that subjects heard only one version of a question and were not aware that the total number of bananas (viz. 20) was equal in other versions of the question.

Table 3
Questions 3 and 4

3A.	Bob and John become shipwrecked on an uninhabited island. The only food is bananas which the castaways collect and throw into a pile daily. Bob and John are identical in terms of abilities and work effort except that Bob was born with only one hand and John with two. <i>John picks 14 bananas per day while Bob can pick only 6 because of his condition.</i> John takes 12 bananas from the pile leaving 8 bananas for Bob. Fair 17% Unfair 83% $N = 117, P < 0.001$
3B.	... <i>John picks 16 bananas per day while Bob can pick only 4 because of his condition.</i> ... Fair 28% Unfair 72% $N = 121, P < 0.001$
3C.	... <i>John picks 18 bananas per day while Bob can pick only 2 because of his condition.</i> ... Fair 39% Unfair 61% $N = 109, P = 0.008$
4A.	Tom and Sam both work <i>in a grocery store.</i> They have the same qualifications and work <i>performance.</i> <i>The grocery store pays Tom more than Sam.</i> Fair 14% Unfair 86% $N = 104, P < 0.001$
4B.	... <i>in a grocery store.</i> ... <i>performance.</i> <i>The grocery store has two separate jobs, which cannot be efficiently combined, and assigns Tom to the higher paying and higher valued job of stocking shelves whereas Sam is assigned to the lower paying and lower valued job of bagging groceries.</i> Fair 33% Unfair 67% $N = 97, P < 0.001$
4C.	... <i>stocking the shelves of a grocery store.</i> ... <i>performance except that Tom, who is tall, can stock the higher shelves more quickly than Sam, who is short. The grocery store pays Tom more than Sam.</i> Fair 17% Unfair 83% $N = 112, P < 0.001$
4D.	... <i>in a grocery store.</i> ... <i>performance except that Tom, who is tall, can stock the higher shelves more quickly than Sam, who is short. The grocery store has two separate jobs, which cannot be efficiently combined, and assigns Tom to the higher paying and higher valued job of stocking shelves whereas Sam is assigned to the lower paying and lower valued job of bagging groceries.</i> Fair 35% Unfair 65% $N = 93, P = 0.003$

Efficiency as a justice concern is explored in more explicit but still general terms in question 4 from the telephone interviews, which is also found in Table 3. In all versions, Tom is paid more than Sam. In version A, this is despite their equal productivity, B provides an efficiency rationale for the pay difference based on technological considerations, C portrays a situation in which the justification for the pay differential is related to the personal exogenous characteristics of the members, and D combines these elements of B and C.

The unfairness of a pay differential in all versions supports accountability as the overriding concern in this scenario. Nevertheless, the difference in the percentage of subjects favoring efficiency by responding “fair” to B over A and to D over C is almost identical and highly significant (for both $P = 0.002$). On the other hand, the differences in responses between versions A and C and between B and D are very small and statistically insignificant ($P = 0.609$ and $P = 0.717$, respectively). The results from this block design imply that efficiency, and not exogenous personal differences, drives the shift in the number of subjects favoring differences in allocations.

Question 4 introduces efficiency in explicit but general terms. Economists, on the other hand, have specific meanings for this, Pareto efficiency being the basic concept (Pareto,

1906). *Pareto efficient* (or *optimal*) allocations are determined based on application of the *Pareto Principle* (or *Criterion*). Let y and y' be $n \times 1$ vectors representing two allocations to the n members of a reference group. Then the Pareto Principle may be expressed as follows.

PARETO PRINCIPLE: “An allocation y is *Pareto preferred* to (is *Pareto superior* to, or *Pareto dominates*) y' if y is weakly preferred by all and strictly preferred by at least one person to y' .”

If preferences are continuous, monotonic and not interdependent, the Pareto Principle may be stated in terms of the allocable variable. Let y_i and y'_i represent the i th elements of y and y' , respectively, i.e. the i th member’s respective allocations. Then y is Pareto preferred to y' if and only if the following two conditions are satisfied:

$$\sum_{i=1}^n y_i > \sum_{i=1}^n y'_i, \quad (4)$$

and

$$y_i \geq y'_i, \quad \forall i. \quad (5)$$

Question 5A in Table 4 asks subjects to select the fairer of two plans, one of which Pareto

Table 4

Question 5

5A. A small newly independent island nation is considering how to allocate its one banana plantation and its one sugar plantation. There are only two farmers on the island interested in these plantations. The government chooses among the following two plans either of which would result in the same total production of both bananas and sugar.

Plan X: Both farmers receive one-half of each plantation. Each farmer earns an average profit of US\$ 100 per day from bananas and sugar combined. Therefore, the total of both farmers’ profits is US\$ 200 per day.

Plan Y: One farmer receives the banana plantation and the other farmer receives the sugar plantation. The average daily profit of the banana farmer is US\$ 150 and that of the sugar farmer is also US\$ 150. At US\$ 300 per day, combined profits are greater under this plan because specialization reduces production costs.

Please circle the plan that you consider more fair:

Plan X 20% Plan Y 80% $N = 147, P < 0.001$

5B. ... The farmers’ profits are unequal since the sugar plantation is more profitable than the banana plantation: average daily profit of the banana farmer is US\$ 90 and that of the sugar farmer is US\$ 160. At US\$ 250 per day, ...

Plan X 59% Plan Y 41% $N = 148, P = 0.011$

5C. ... The farmers’ profits are unequal since the sugar plantation is more profitable than the banana plantation: average daily profit of the banana farmer is US\$ 100 and that of the sugar farmer is US\$ 200. At US\$ 300 per day, ...

Plan X 57% Plan Y 43% $N = 132, P = 0.059$

5D. ... The farmers’ profits are unequal since the sugar plantation is more profitable than the banana plantation: average daily profit of the banana farmer is US\$ 50 and that of the sugar farmer is US\$ 200. At US\$ 250 per day, ...

Plan X 78% Plan Y 22% $N = 110, P < 0.001$

dominates the other. Here, with no ramifications for consumers (since both plans result in the same total production), the focus is on fairness to the farmers. The majority chooses Plan Y, the Pareto efficient choice.

A strength of the Pareto Principle is its lack of reliance on interpersonal utility comparisons. One of its weaknesses is that it yields an incomplete ordering of allocations since certain allocations are not comparable, i.e. y may be preferred by some i but y' by others. Arguably, few if any changes in the real world generate no losers. As an alternate definition of efficiency, therefore, we also consider the *Compensation Principle*, the main approach to overcoming this shortcoming of the Pareto Principle. Variations on the Compensation Principle may be traced to Hicks (1940), Kaldor (1939), Scitovsky (1941) and Samuelson (1950). Here we use a version of Kaldor's definition, although, for the simple vignettes we consider, the various definitions are equivalent.

COMPENSATION PRINCIPLE: “An allocation y is preferable to y' if it is potentially Pareto preferred, that is, if it is hypothetically possible to undertake lump-sum redistribution from y to achieve an allocation that Pareto dominates y' .”

Note that for y to be ranked above y' , the prescribed redistribution does not actually have to be carried out, it need only be hypothetically possible.

With the aforementioned assumptions on preferences, the Compensation Principle reduces simply to (4), that is, y is preferred to y' if $\sum_{i=1}^n y_i > \sum_{i=1}^n y'_i$. If the total allocation is greater, winners could hypothetically compensate losers, and (5) is superfluous. This principle is tested in question 5B, which differs from 5A only with respect to the profits under Plan Y. In comparison to Plan X where each gets US\$ 100, under Plan Y the banana farmer is worse off by US\$ 10 and the sugar farmer is better off by US\$ 60. A significant majority of respondents opposes Plan Y, the more efficient allocation according to the Compensation Principle. Results to additional questions indicate that increasing or decreasing the Plan Y total from around US\$ 250 reduces support for that plan even further. The Compensation Principle, therefore, fails to dominate in this scenario.

In 5A only efficiency is varied since the farmers appear equally accountable in both plans. Version C of this question explores whether support for the Pareto Principle is maintained even when it conflicts with accountability. This version differs from 5A only in that Plan Y gives the banana farmer daily profits of US\$ 100 and the sugar farmer US\$ 200. The total daily profits are still US\$ 300, the same as in version A, and Plan Y is still Pareto optimal, but this allocation now conflicts with accountability. The majority swings over to Plan X, which is inefficient but satisfies accountability. Although this majority falls slightly short of significance at the 5% level, the decrease in the number of subjects favoring Plan Y is highly significant ($P < 0.001$). Thus, even the ostensibly innocuous Pareto Principle loses support when it conflicts with accountability.

The results to question 5C suggest that the lack of support for the Compensation Principle in 5B is due to efficiency having a run-in with accountability. Version D further examines the trade-off between the Compensation Principle and accountability by increasing the inequality in version B and giving the banana farmer profits of US\$ 50 and the sugar farmer profits of US\$ 200 under Plan Y. The picture worsens for the Compensation Principle. With total daily profits of US\$ 250, Plan Y is equally efficient in both versions. In version D, however, that plan conflicts more strongly with accountability, and there is a significantly lower level of support for it ($P = 0.001$). These results support the influence of efficiency

on justice evaluation as well as predictions of the fairness preference function about the marginal importance of different principles.

2.3. Needs Principle

Although necessities or needs loom larger in the history of political economy (e.g. Smith, 1776; Malthus, 1798; Marx, 1875), Baxter and Moosa (1996) conclude that they also have current empirical significance. Since basic economic needs encompass different commodities such as food, clothing and housing, here we will think of the allocable variable as a composite good or as purchasing power over basic need commodities. Then, the Needs Principle is stated as follows.

NEEDS PRINCIPLE: “An allocation y is just if $y_i \geq \eta_i^n$, $\forall i$, where η_i^n is the minimum amount that satisfies the basic needs of the i th member.”

There is both implicit and explicit evidence from the surveys of a concern for needs. Table 5 contains additional results for question 1. Question 1D is identical to 1A except that Bob picks and takes 14 bananas instead of 12 and John picks and receives 6 bananas instead of 8. In version E, Bob picks and takes 16 bananas and John picks and takes 4. A significant majority of respondents in all versions approve of allocations corresponding to the Accountability Principle. Nevertheless, the number of subjects responding “fair” decreases as the inequality increases. Those choosing “fair” in D is 5% points below the 74% in version A, an insignificant decrease ($P = 0.237$). The lower percentage of “fair” responses in version E, however, is significantly below that in A ($P = 0.011$) and D ($P = 0.034$). This raises the suspicion that respondents are increasingly concerned, as the disparity rises, that allocations in keeping with accountability are sufficient to meet John’s basic needs.

In question 1, there may be some uncertainty as to what each member’s basic needs are. Question 6, also in Table 5, explicitly introduces basic needs, in words and in numbers, into the picture. In version A, 89% of subjects indicated that fair amounts are sufficient for basic needs, i.e. 89% allocated US\$ 50 million or more to Project X, thereby satisfying basic needs by returning the starving population to subsistence. In question 6A, eastern Parador’s misfortune is due to an exogenous event, a drought. Version B of this question considers the same predicament when it is caused by a discretionary action by those afflicted. The 14% point drop in those allocating amounts sufficient for eastern Parador’s needs is significant ($P = 0.002$) as is the decrease in the mean allocation to Project X from US\$ 53.4 million to US\$ 46.3 million ($P < 0.001$). This suggests a trade-off between accountability and needs, although basic needs still garner a large and significant majority of responses and, in this scenario, dominate accountability.

One possible reason for needs dominating all other concerns in versions A and B of this question is the ease with which this criterion is satisfied: one need only allocate one-half of the total. The (opportunity) cost of meeting needs is an efficiency cost in the Compensation Principle sense. US\$ 100 spent on Project X temporarily saves one person whereas the same amount spent on Project Y permanently raises one person (and, presumably, future generations) to a moderate standard of living. Project Y seems more attractive than X except for the concern for basic needs. This efficiency cost is increased in version C, which

Table 5

Question 1 continued and question 6

-
- 1A. Bob and John are identical in terms of physical and mental abilities. They become shipwrecked on an uninhabited island where the only food is bananas. They can collect as many bananas as they want by climbing up a tree, picking them before they fall into the ocean and throwing them into a pile. *In this way Bob picks 12 bananas per day and John picks 8 per day. Bob takes from the pile the 12 bananas he picked leaving John with the 8 that John picked.* Please rate this as:
Fair 74% Unfair 26% $N = 76, P < 0.001$
- 1D. ... *In this way Bob picks 14 bananas per day and John picks 6 per day. Bob takes from the pile the 14 bananas he picked leaving John with the 6 that John picked.* ...
Fair 69% Unfair 31% $N = 119, P < 0.001$
- 1E. ... *In this way Bob picks 16 bananas per day and John picks 4 per day. Bob takes from the pile the 16 bananas he picked leaving John with the 4 that John picked.* ...
Fair 58% Unfair 42% $N = 125, P = 0.045$
- 6A. Parador is an underdeveloped country whose people live at subsistence level: only their basic needs for food, shelter and clothing are satisfied. The only assistance available is a one time grant of US\$ 100 million which the government of Parador has received. It can distribute this grant as it sees fit between two projects.
Project X: In eastern Parador there is malnutrition due to a drought. To prevent the starvation of the 500,000 people affected and to return them to subsistence level would require US\$ 100 per person, or US\$ 50 million.
Project Y: In western Parador there is an agricultural development program awaiting funding which would permanently raise its members from subsistence level to a moderate standard of living. Its cost is also US\$ 100 per person.
- What do you think is the most fair distribution of the US\$ 100 million between Projects X and Y (express in millions of dollars and make sure the total is US\$ 100 million)?
Project X: ___ million Project Y: ___ million
 \geq Needs 89% $<$ Needs 11% $N = 122, P < 0.001$
- 6B. ... *because the people there sold too much of their crops last season in order to buy imported radios and televisions and did not save enough seed to plant for the current harvest. To prevent the starvation of the 500,000 people affected and to return them to subsistence level would require US\$ 100 per person, or US\$ 50 million.* ...
 \geq Needs 75% $<$ Needs 25% $N = 130, P < 0.001$
- 6C. ... *due to a drought. To prevent the starvation of the 800,000 people affected and to return them to subsistence level would require US\$ 100 per person, or US\$ 80 million.* ...
 \geq Needs 45% $<$ Needs 55% $N = 132, P = 0.148$
- 6D. ... *due to a drought. To prevent the starvation of the 1,000,000 people affected and to return them to subsistence level would require US\$ 100 per person, or US\$ 100 million.* ...
 \geq Needs 19% $<$ Needs 81% $N = 119, P < 0.001$
-

is identical to A except that 800,000 people are affected by the drought requiring US\$ 80 million to Project X to fulfill basic needs. In version D, 1,000,000 people are affected, and returning them to subsistence requires the entire US\$ 100 million grant. In comparison to the mean allocation to Project X of US\$ 53.4 million in 6A, there is a significant increase to US\$ 61.1 million in 6C ($P = 0.002$) and to US\$ 62.6 million in 6D ($P = 0.002$). Nevertheless, any amount less than US\$ 80 million in 6C and US\$ 100 million in 6D fails

to satisfy basic needs. The percentage supporting full funding of Project X in version C is one-half that in version A, a statistically significant drop ($P < 0.001$). In version D, the number of subjects allocating amounts that satisfy needs is lower than in version A or C (for both differences $P < 0.001$), and a significant majority opposes committing all funds to Project X. This establishes that efficiency in the sense of the Compensation Principle may also dominate justice evaluation.

These results suggest a concern for basic needs that is balanced against both accountability and efficiency. This may be represented by adding a term for needs, $-f^n(y_i - \eta_i^n)$, to the observer's preference function. There is one functional difference between this term and those for accountability and efficiency that seems sensible: the need based preference relates only to allocations that fall short of η_i^n , but once basic needs are satisfied, there is no disutility associated with deviations from η_i^n , i.e. this term is strictly concave if $y_i < \eta_i^n$ but equals the constant $-f^n(0)$ for all $y_i \geq \eta_i^n$. That is, observers do not oppose allocations in excess of basic needs, and when needs are satisfied, this term falls away as a distributional concern.

2.4. Threshold effect: fair enough!

The three preceding subsections presented the three justice principles and the preferences over them. This subsection and the following one examine two important but more subtle points about the relationship between reported fairness and the underlying fairness preferences.

Asked to categorize a set of firms or industries as either “efficient” or “inefficient”, most economists would probably place at least some in the former category despite the fact that the efficiency of standard theory is probably never completely satisfied in the real world. Similarly, subjects asked to label allocations as “fair” or “unfair” allow slack between the strict norm and the reality, a phenomenon I call the *threshold effect*. In other words, an observer takes degrees of disutility, $-f(y_i - \eta_i)$, and converts them into discrete categories, e.g. “fair” or “unfair”.

Taking account of this effect helps to explain certain results that appear to repudiate the proposed theory. Kahneman et al. (1986a) (hereafter KKT) report findings of a survey of Canadian residents in their Study 2 (1986a) that arguably contradict the Accountability Principle. One version of this study was replicated in my written questionnaire as question 7A. The responses, reported in Table 6, appear even less supportive of the hypothesis than KKT's results. Profit has increased due to the factory's reduced costs. A straightforward application the accountability formula to this transaction suggests that the factory is obliged to lower its price and share this surplus with the wholesaler, yet most subjects appear to disagree. Another interpretation attributes this to the threshold effect whereby the original price is, in the view of most respondents, not entirely fair but still within the tolerable range of the just price. If that is the case, the preferred price of most respondents should still be lower as suggested by the results to question 7B.⁹ Only 18% of respondents find an unchanged price the most fair one whereas a highly significant majority of 82% ($P < 0.001$) support a price decrease (although no single price is significant, probably due to ambiguity about facts relevant to fairness, e.g. what the initial relative profits were of the factory versus the

⁹ This interpretation also provides an explanation for the results to KKT's questions 11A and 11B (1986b).

Table 6
Questions 7 and 8

7A.	Suppose a factory produces a particular table which it sells to wholesalers. The factory has been selling all the tables it can produce for US\$ 150 each. Suppose that the factory has now found a supplier who charges US\$ 20 less for the materials needed to make each table. <i>Does fairness require the factory to change its price from US\$ 150?</i>				
	Yes 35%	No 65%	$N = 162, P < 0.001$		
7B.	... <i>What price is now fair to the factory and to the wholesalers?:</i>				
	A US\$ 150	18%			
	B US\$ 140	51%			
	C US\$ 130	31%			
	$N = 158, P = 0.437$				
8A.	Suppose a furniture manufacturer is the single supplier of chairs to a retail store, and both firms have similar sales volume and profits. Suppose that both firms would agree that US\$ 100 is a fair price for the retail store to pay the furniture manufacturer for each chair: this price gives a fair return to the furniture manufacturer on its investment of time and money. <i>Nevertheless, through government price controls, the price is set somewhat higher. This still leaves the retail store with a small profit on its retail sale of the chairs.</i> Please rate this price as:				
	Very fair 3%	Fair 62%	Unfair 33%	Very unfair 2%	
	65%		35%		$N = 79, P = 0.005$
8B.	... <i>In fact, the price is set at US\$ 100. ...</i>				
	Very fair 31%	Fair 55%	Unfair 11%	Very unfair 3%	
	86%		14%		$N = 73, P < 0.001$
8C.	... <i>Nevertheless, through government price controls, the price is set somewhat lower. This still leaves the retail store with a small profit on the chairs. ...</i>				
	Very fair 4%	Fair 50%	Unfair 39%	Very unfair 7%	
	54%		46%		$N = 79, P = 0.215$
8D.	... <i>Nevertheless, through government price controls the price is set substantially lower. This leaves the furniture manufacturer with a very small profit on the chairs. ...</i>				
	Very fair 4%	Fair 29%	Unfair 51%	Very unfair 16%	
	33%		67%		$N = 84, P = 0.002$
8E.	... <i>Nevertheless, through government price controls the price is set very much lower. This forces the furniture manufacturer to produce the chairs at a loss. ...</i>				
	Very fair 0%	Fair 8%	Unfair 55%	Very unfair 37%	
	8%		92%		$N = 79, P < 0.001$

wholesaler, and whether the factory expended effort and costs that “earned” it the higher price).

Question 7 illustrates one advantage of increasing the number of response categories. The binary choice format also has advantages, however, including its resemblance to many real decision-making situations such as the choice of labor unions about whether or not to strike, or of consumers about whether or not to boycott a product. In addition, respondents seem to find this format easier and quicker to use, and the analysis of the results is more straightforward than of data with more than two categories. Nevertheless, some information may be lost with this method. As stated at the beginning of Section 2, we assume that as injustice in the eyes of a typical observer increases, so will the number of respondents who view the allocation in question as unfair. Responses to binary choices, however, provide no

evidence on the claim of inequity aversion that the typical *individual* experiences injustice in multiple, rather than merely dual, degrees. Instead it could be that respondents view allocations only as either “fair” or “unfair”, and the results to these binary choices could be due to dispersion across respondents in the *level* or *range* of perceived fair values. Question 8 in Table 6 addresses this issue by increasing the response categories from two to four. The results are presented in complete form and in a form that condenses “very fair” and “fair” as well as “unfair” and “very unfair”.

Although the government chooses a higher than fair price in version *A*, 62% of respondents find this price “fair” and 3% “very fair”. Since the price is only “somewhat higher” than the just one, it is fair enough. It seems that those who find this price “unfair” or “very unfair” have a lower tolerance for (or higher sensitivity to) injustice. In version *B*, the price is fair, and there is a significant increase in the fraction responding “fair” or “very fair” ($P < 0.001$). As the four choice format reveals, this is due mostly to change in the perceived degree of fairness manifested by an increase in responses in the “very fair” category. For version *C*, the price is set somewhat lower than the fair one, still leaving the furniture manufacturer with a “small profit”. In version *D*, the price is substantially lower, leaving the furniture manufacturer with a “very small profit”, and in version *E*, the lower price forces the furniture manufacturer to produce the chairs at a “loss”. In *8B*, the price is fair whereas versions *C* to *E* portray a price that is progressively lower than the fair one and that increasingly jeopardizes the furniture manufacturer’s profit. There is a statistically significant decrease in the perceived fairness of the price in version *C* versus *B* ($P < 0.001$), *D* versus *C* ($P = 0.004$) and *E* versus *D* ($P < 0.001$).¹⁰ The consistent shifts across the four categories corroborate the assumed degrees of unfairness.

2.5. The senses of justice

A second subtlety of the relationship between the fairness preference and reported fairness has to do with the fact that justice terminology is used in different senses (see, for example, Hare, 1991). Aristotle (1976), in the earliest known treatment of this, wrote that “justice and injustice seem to be used in more than one sense” (1129a 25). He distinguished justice that “is not a part of virtue but the whole of excellence or virtue” versus “justice as a part of virtue” (1130a 5, 10), or what we will call here “generic” and “specific” justice, respectively. The multiple meanings characterize not only ancient but modern usage: Webster’s Seventh New Collegiate Dictionary, for example, defines the word *just* in the sense of (1) “morally right or good”, as well as (2) “merited, deserved”. The first sense signifies the broadest notion of ethical judgment, whereas the second sense connotes a particular, about which Aristotle writes “the just is something proportionate” (1131a 30).

Generic justice encompasses all distributional concerns including accountability, efficiency and needs, and the concern for it, represented in the most general functional form for some allocation (vector) y , is denoted $g(y, \eta^a, \eta^e, \eta^n)$. Specific justice is described as “a part of” this and “proportionate”. One claim we set out to prove is that specific justice is the preference for accountability alone, denoted $s(y, \eta^a)$. Moreover, the argument is that

¹⁰ For further evidence on this, see Jasso (1978, 1983, 1999), who is probably the most prolific investigator of the degrees of unfairness and whose work is consistent with the findings here.

responses to questions about the justice of an allocation are related to a weighted average of generic justice and specific justice. That is, the “reported” justice that one observes in surveys is related to

$$f(y, \eta^a, \eta^e, \eta^n) = \alpha g(y, \eta^a, \eta^e, \eta^n) + (1 - \alpha) s(y, \eta^a) \quad (6)$$

where $0 < \alpha < 1$. This could be due to the fact that all respondents care about both types of justice, or that some care about generic justice and others about specific justice, or both. In any case, an implication is that accountability plays a special role. The point is not that accountability necessarily dominates the other principles (that depends on the scenario), but rather that it is more heavily weighted in reported justice than in generic justice. That fact provides a means to test these claims about the senses of justice. There is no special term to distinguish specific justice from reported justice: the terms “fair” and “just” are used to refer to both. But there is an indirect means to establish evidence of specific justice: subject choices should vary depending on whether their goal is to be “fair”, reflecting reported justice (i.e. an average of generic and specific justice), or whether their goal is to

Table 7

Question 5 continued

5B. A small newly independent island nation is considering how to allocate its one banana plantation and its one sugar plantation. There are only two farmers on the island interested in these plantations. The government chooses among the following two plans either of which would result in the same total production of both bananas and sugar.

Plan X: Both farmers receive one-half of each plantation. Each farmer earns an average profit of US\$ 100 per day from bananas and sugar combined. Therefore, the total of both farmers’ profits is US\$ 200 per day.

Plan Y: One farmer receives the banana plantation and the other farmer receives the sugar plantation. *The farmers’ profits are unequal since the sugar plantation is more profitable than the banana plantation: average daily profit of the banana farmer is US\$ 90 and that of the sugar farmer is US\$ 160. At US\$ 250 per day, combined profits are greater under this plan because specialization reduces production costs.*

Please circle the plan that you consider more fair:

Plan X 59% Plan Y 41% $N = 148, P = 0.011$

5B'. . . . *The farmers’ profits are unequal since the sugar plantation is more profitable than the banana plantation: average daily profit of the banana farmer is US\$ 90 and that of the sugar farmer is US\$ 160. At US\$ 250 per day, . . .*

Please circle the plan that you think the government should choose:

Plan X 43% Plan Y 57% $N = 123, P = 0.063$

5A. . . . *The average daily profit of the banana farmer is US\$ 150 and that of the sugar farmer is also US\$ 150. At US\$ 300 per day, . . .*

Please circle the plan that you consider more fair:

Plan X 20% Plan Y 80% $N = 147, P < 0.001$

5A'. . . . *The average daily profit of the banana farmer is US\$ 150 and that of the sugar farmer is also US\$ 150. At US\$ 300 per day, . . .*

Please circle the plan that you think the government should choose:

Plan X 12% Plan Y 88% $N = 124, P < 0.001$

be morally “right”, reflecting generic justice alone (i.e. coinciding with what people think *should* be chosen in a more general moral sense). To test this, subjects were confronted with contrasting questions involving pairwise trade-offs between principles. These questions use scenarios reported above with the difference that the respondents were asked to evaluate not the fairness but the rightness of the stated allocations. If accountability captures justice in the specific sense, one would expect certain shifts in responses in comparing the “fair” version with the “right” version of each question.

For example, in a face-off between accountability and efficiency one would expect a shift toward efficiency when subjects are asked to choose the right allocation as opposed to the fair allocation. Table 7 presents question 5B', which is identical to 5B with Plan X corresponding to the Accountability Principle and Plan Y to the Compensation Principle, except that the last sentence asks respondents to select the plan they think the government *should* choose rather than the plan they consider more *fair*. Plan Y, which was viewed as more fair by only 41% of subjects, is now viewed as the right plan by 57%, a significant 16% point shift ($P = 0.004$) in support of the hypothesis. Pareto efficiency is addressed in 5A where both Plans X and Y satisfy accountability but only Plan Y is efficient. Question 5A' is identical to 5A except, as above, for the last sentence. Even with the already strong support for efficiency in this scenario, there is a significant 8% point shift ($P = 0.049$) toward the Pareto efficient choice.

Turning now to the trade-off between accountability and needs, question 1A' in Table 8 is identical to 1A with a 12/8 split of bananas to Bob and John based on accountability except that the last sentence asks whether this is the number that should be distributed to each with the choices “yes” and “no” rather than asking for a “fair” or “unfair” rating. The 27% point drop from 74% responding “fair” to only 47% responding “yes” is highly significant ($P < 0.001$) reflecting a considerable shift from away from accountability. Of

Table 8
Question 1 continued

-
- 1A. Bob and John are identical in terms of physical and mental abilities. They become shipwrecked on an uninhabited island where the only food is bananas. They can collect as many bananas as they want by climbing up a tree, picking them before they fall into the ocean and throwing them into a pile. *In this way Bob picks 12 bananas per day and John picks 8 per day. Bob takes from the pile the 12 bananas he picked leaving John with the 8 that John picked. Please rate this as:*
- Fair 74% Unfair 26% $N = 76, P < 0.001$
- 1A'. ... *In this way Bob picks 12 bananas per day and John picks 8 per day. Bob takes from the pile the 12 bananas he picked leaving John with the 8 that John picked. Please indicate whether you think this is the number of bananas that should be distributed to each:*
- Yes 47% No 53% $N = 119, P < 0.261$
- 1E. ... *In this way Bob picks 16 bananas per day and John picks 4 per day. Bob takes from the pile the 16 bananas he picked leaving John with the 4 that John picked. Please rate this as:*
- Fair 58% Unfair 42% $N = 125, P = 0.045$
- 1E'. ... *In this way Bob picks 16 bananas per day and John picks 4 per day. Bob takes from the pile the 16 bananas he picked leaving John with the 4 that John picked. Please indicate whether you think this is the number of bananas that should be distributed to each:*
- Yes 39% No 61% $N = 128, P = 0.007$
-

Table 9

Question 6 continued

- 6A. Parador is an underdeveloped country whose people live at subsistence level: only their basic needs for food, shelter and clothing are satisfied. The only assistance available is a one time grant of US\$ 100 million which the government of Parador has received. It can distribute this grant as it sees fit between two projects.

Project X: In eastern Parador there is malnutrition due to a drought. To prevent the starvation of the 500,000 people affected and to return them to subsistence level would require US\$ 100 per person, or US\$ 50 million.

Project Y: In western Parador there is an agricultural development program awaiting funding which would permanently raise its members from subsistence level to a moderate standard of living. Its cost is also US\$ 100 per person.

What do you think is the most fair distribution of the US\$ 100 million between Projects X and Y (express in millions of dollars and make sure the total is US\$ 100 million)?

Project X: ___ million Project Y: ___ million
 \geq Needs 89% < Needs 11% $N = 122, P < 0.001$

- 6A'. ... *How do you think the US\$ 100 million should be distributed between Projects X and Y ...*
 \geq Needs 87% < Needs 13% $N = 123, P < 0.001$

course, the respondents might actually prefer a less equal, rather than more equal, allocation in IA' (although it is difficult to conceive why). Question IE' , however, tends to dispel this conjecture: it is the “right” as opposed to “fair” version of IE with a 16/4 split of bananas. The majority choice of “no” is significant as is the 19% point lower rate of “yes” responses versus “fair” responses in version IE ($P = 0.002$).

Finally, let us compare only efficiency and needs, suppressing accountability. Whether such a question is phrased in terms of rightness or fairness should not matter since in the fairness version justice contains no specific meaning, only the generic meaning of rightness. If, however, efficiency or needs represents justice in the specific sense, one would expect a shift away from it in the rightness formulation. Question $6A'$ in Table 9 replicates $6A$ where US\$ 50 million to Project A is necessary to meet basic needs except that the last sentence asks how the US\$ 100 million should be distributed between the two projects rather than what the most fair distribution is. The difference in the percentage of subjects allocating enough for needs in this version versus $6A$ is small (2%) and insignificant ($P = 0.569$, two-sided test), consistent with the hypothesis.

To summarize, the claim is that efficiency and needs are only “just” (in the generic sense) because they are “good”. Accountability, on the other hand, is only “good” because it is “just” (in the specific sense). Efficiency and needs exist as distributional goals distinct from justice, whereas accountability represents the distinguishing feature of justice, which, presumably, is why specific justice is not expressed with a distinct word in everyday language, as is the case with efficiency and needs.¹¹ Although substantial evidence has been presented in the foregoing sections that efficiency and needs impact and sometimes even

¹¹ Some writers, e.g. Rawls, have distinguished “justice” and “fairness”, but I know of no evidence that the general public makes such a qualitative distinction.

dominate experiential justice, some readers view certain scenarios featuring those principles as being rather “forced” to think of in justice terms, to which I respond: “Precisely!” They lack the specific sense of justice, and this intuition adds support, I believe, to the contention that accountability is specific justice, indeed that *accountability is the quintessence of justice*.

3. Context

The foregoing justice principles appear relatively straightforward and simple. I believe the chief reason that justice has, nevertheless, remained an elusive concept is because the greatest challenge to formulating and verifying a positive theory of justice is related to issues of context. One aspect of context is the relative importance attached to each of the justice principles in a particular situation. This was already incorporated into the analysis of the previous section. In this section we take the justice principles and fairness preferences as given and study other aspects of context. Specifically, we focus on various *contextual effects*: the effects on justice evaluation of variations in the “stated context”, e.g. in the information provided in a scenario.

3.1. Scope effects: justice for all?

The justice principles determine the fair amount of a given variable using a given reference group, but they are silent on the appropriate scope of comparison, i.e. on the appropriate choice of allocable variables and persons. Since this is subject to differing interpretation, one observes *scope effects*, that is, a sensitivity of reported fairness to the stated set of variables and persons.

With regard to the stated variables, the reader will recall from question 2 in Section 2.1 how information on one variable, restaurant profits, affected the fair level of another variable, the rental price for a video game machine. Further evidence of the effect of information about variables on reported fairness is found in Table 10, which presents additional versions of question 8 and repeats 8D for comparison with these. Question 8F is identical to 8D with a less than fair price except for the added statement that “Chairs are the only item which the furniture manufacturer produces”. There is a significant 12% point increase in those responding “unfair” or “very unfair” to this version versus version D ($P = 0.033$). Version G adds to the end of D “Nevertheless, chair sales represent a small fraction of the furniture manufacturer’s business since it produces many other profitable goods”. There is a significant 32% point decrease in the “unfair” and “very unfair” responses in comparison to 8D ($P < 0.001$). These three versions vary the importance of this transaction to the overall profit of the furniture manufacturer and demonstrate that this “unfair” price is fairer the less its importance to the seller’s profit. This phenomenon is important, I believe, for understanding how the fair price of one transaction may be influenced by the fairness of the overall allocations of the transactors, e.g. the practice common in regulated industries of charging lower prices to low income users.

Question 9 demonstrates how the stated set of persons affects the choice of reference group and, therefore, reported fairness. The US\$ 9 million per year salary of a chief executive

Table 10

Question 8 continued and question 10

8D. Suppose a furniture manufacturer is the single supplier of chairs to a retail store, and both firms have similar sales volume and profits. Suppose that both firms would agree that US\$ 100 is a fair price for the retail store to pay the furniture manufacturer for each chair: this price gives a fair return to the furniture manufacturer on its investment of time and money. Nevertheless, through government price controls the price is set substantially lower. This leaves the furniture manufacturer with a <u>very</u> small profit on the chairs. Please rate this price as:				
Very fair 4%	Fair 29%	Unfair 51%	Very unfair 16%	
	33%		67%	$N = 84, P = 0.002$
8F. ... chairs. Chairs are the only item that the furniture manufacturer produces. Please ...				
Very fair 0%	Fair 21%	Unfair 68%	Very unfair 11%	
	21%		79%	$N = 88, P < 0.001$
8G. ... chairs. Nevertheless, chair sales represent a small fraction of the furniture manufacturer's business since it produces many other profitable goods. Please ...				
Very fair 4%	Fair 61%	Unfair 34%	Very unfair 1%	
	65%		35%	$N = 85, P = 0.003$
9A. Brown is the chief executive officer (CEO) of a multinational corporation that produces and sells clothing. Brown earns US\$ 9 million per year, a salary that is <i>around that of CEOs at comparable corporations</i> . Please rate Brown's salary as:				
Fair 70%	Unfair 30%	$N = 137, P < 0.001$		
9B. ... around 300 times that of the average worker at his corporation. ...				
Fair 43%	Unfair 57%	$N = 150, P = 0.038$		

officer (CEO) is viewed as fair when compared to CEOs at similar corporations but as unfair when compared to the earnings of workers at the CEO's own company. The 27% shift in the percentage of "fair" responses is highly significant ($P < 0.001$), further evidence of scope effects.

3.2. Information effects

Arguably, an observer never possesses all information potentially relevant to justice evaluation. Changes in *explicit* information may, therefore, have a significant impact on reported justice through their effect on the *implicit* assumptions of the observer. Information effects have to do with how the stated context affects the filling of information gaps, and two types of effects are identified here.

First, observers may *extrapolate* from the information provided and form estimates of the values of unstated but relevant variables or conditions. Consider again question 7A, which examines the fairness of the price charged by a factory for a chair after its costs have fallen. As originally presented in KKT (1986a), this question appeared in a variety of versions, one of which made the seller a carpenter, instead of a factory. The percentage of KKT's respondents indicating that, for the sake of fairness, no price change is required is 15% higher for the carpenter than for the factory. One interpretation of this difference is that many subjects assume that the carpenter is operating on a smaller initial profit margin than the factory and that it is more fair, therefore, for the carpenter to benefit

Table 11
Question 7 continued and question 9

7C.	Suppose that a factory and carpenter working alone produce identical tables and that both sell them to wholesalers for the same price of US\$ 150 per table. Who would you expect to make a greater profit on each table?		
	Factory 76%	Carpenter 24%	$N = 264, P < 0.001$
10A.	A moderate sized company in a small community is the major local employer. The workers of the company are represented by their own independent local labor union. <i>Sales of the company's product fall significantly, so the company cuts pay by 10%.</i>		
	Fair 59%	Unfair 41%	$N = 191, P = 0.006$
10B.	<i>... Business for the company is good, but the local cost of living to workers has recently increased significantly. The labor union demands a 10% increase in pay.</i>		
	Fair 86%	Unfair 14%	$N = 182, P < 0.001$

from the cost reduction. The results to question 7C in Table 11 are consistent with this reading.

Questions 10A and 10B provide examples of extrapolation about initial allocations to judge the fairness of changes in the terms of transaction. In 10A, a presumably exogenous event causes a decline in the firm's surplus relative to workers, and a fair pay cut redistributes the reduced total surplus from workers to firm. In version B, workers experience a decrease in their surplus due to increased living costs, clearly an exogenous change, and a fair pay hike redistributes the remaining surplus from firm to workers. Of course, the fairness of these changes is predicated on fair initial allocations, as suggested by the portrayal in the question of a bilateral monopoly in which the parties appear roughly equal in strength.

Second, when there is insufficient basis for extrapolation, observers may make the *ceteris paribus* assumption, i.e. the assumption that the values of unknown variables are equal across members of the reference group. In the current study, examples of the *ceteris paribus* assumption are plentiful. Respondents to 2A implicitly assume that Davis and Thompson are equally profitable, but an inequality that is made explicit as in 2B is seen to affect justice evaluation. The results to 4A and 4C imply *ceteris paribus* assumptions about efficiency when compared with 4B and 4D, whereas the responses to 1A, 1D and 1E suggest *ceteris paribus* assumptions about needs. With respect to accountability, the results to 2A and 2B in Konow (1996) imply merit is viewed as equal unless discretionary differences become apparent.

I believe that the *ceteris paribus* assumption goes far in explaining the pervasive use of equality as a rule of fairness and its widespread acceptance as a principle of fairness. According to the theory presented here, equality is not a principle of fairness; at best it is a special case of the principles when members are equally accountable, efficient or needy. As the results above imply, however, when information about relevant differences, e.g. discretionary variables, is unavailable or insufficient, such differences are assumed away, and equal splits represent the observer's best estimate of fair allocations. The *ceteris paribus* assumption probably also underlies equality when available information is subject to differing interpretations and equality is viewed as a simple means of avoiding costly information search and/or costly disputes.

3.3. Metric of justice: fair-minded

Justice evaluation requires a unit of account, or a *metric of justice*, e.g. goods, income, utility or satisfaction. The choice of metric is influenced and usually given by the stated context, as when only one allocable variable is presented in a scenario. In fact, this choice is a type of scope effect, but one that merits additional discussion. The choice of metric is important when justice in one variable implies a different allocation from justice in another. Numerous results suggest that, when explicitly offered a choice between goods and the tangible or subjective value derived from those goods, most subjects evaluate justice in terms of the latter. For instance, in cases where fairness implies equality, most survey respondents reject equality in goods in favor of equality in the health benefits conferred by them (Yaari and Bar-Hillel, 1984) or equality in the satisfaction derived from the goods (Konow, 1996). In surveying the literature on allocation preferences, Leventhal et al. (1980) similarly conclude that “the emphasis is on equalizing the members’ psychic gratification rather than actual outcomes” (182-3).

When derived values are not explicit, the previous subsection on information effects implies that observers may abstract from available information. For example, observers might extrapolate from the quantity of goods to the level of satisfaction and make the *ceteris paribus* assumption that utility functions are the same for all members. In this way a fair distribution of goods, which is explicit, may be equated with a fair distribution of utility, which is implicit. In fact, the evidence examined here thus far is consistent with the assumption that members’ preferences are standard well-defined functions of total levels of allocable variables in endstates. Various studies (e.g. Kahneman and Tversky, 1984; Thaler, 1980), however, suggest that preferences are subject to *framing effects*, i.e. choices are affected by the way in which fundamentally equivalent alternatives are presented. Specifically, with framing effects people evaluate alternatives, not in terms of total levels in endstates, but as gains or losses relative to some reference point. In particular, losses are coded more heavily than gains of equal magnitude. KKT (1986b) report several scenarios (e.g. 2, 4, 5, 6 and 9) involving framing effects in justice evaluation. Most questions (2, 4, 5, 6) imply an *endowment effect*, Thaler’s variation on the framing effect where the reference point is the individual’s initial allocation (or endowment, in Thaler’s terminology). In KKT’s question 4 (1986b), the endowment effect is coupled with money illusion: the endowment is a worker’s nominal wage. Thus, a given real wage loss is viewed as fair when due to inflation but as unfair when associated with a nominal wage cut. An implication of the endowment effect is that, when preferences are governed by it, justice corresponds to a fair distribution of the gains or losses of a change, not to fair total allocations in the endstate. A corollary is that it may be fair to preserve unfair *levels* in order to avoid the unfair *gains* and *losses* associated with redistribution. I believe that this provides the most compelling explanation for one of the most enduring and widely observed phenomena of experiential justice literature: the supposed fairness of precedents.¹²

¹² For instance, Zajac notes the preponderance of status quo property rights, e.g. historical claims, grandfather clauses, two-tier pay systems that favor senior workers, etc. Walzer claims that there is a moral asymmetry between the rights of citizens and foreigners. Dornstein (1991) and Messick and Sentis (1983) report the results of numerous studies indicating that the perceived fairness of and satisfaction with current rewards is inversely related to past rewards.

Table 12
Question 11

<p><i>IIA.</i> A small photocopying shop has one employee who has worked in the shop for 6 months and earns US\$ 9 per hour. Business continues to be <i>satisfactory</i>, but a factory in the area has closed and unemployment has increased. Other small shops have now hired reliable workers at US\$ 7 an hour to perform jobs similar to those done by the photocopy shop employee. The owner of the photocopying shop reduces the employee's wage to US\$ 7.</p> <p>Fair 17% (17%) Unfair 83% (83%) $N = 258$ (98), $P < 0.001$ (0.001)</p>
<p><i>IIB.</i> ... <i>satisfactory</i>, but a factory in the area has closed and unemployment has increased ... at US\$ 7 an hour ... The current employee leaves, and the owner decides to pay a replacement US\$ 7 an hour.</p> <p>Fair (73%) Unfair (27%) $N = (125)$, $P < (0.001)$</p>
<p><i>IIC.</i> ... <i>satisfactory</i> since a factory in the area has opened up and local unemployment has fallen. ... at US\$ 11 per hour ... The employee requests an increase in his wage to US\$ 11 which the owner denies.</p> <p>Fair 42% Unfair 58% $N = 198$, $P = 0.017$</p>

The evidence suggests that observers evaluate justice both in terms of standard preferences as well as endowment effects based on changes in nominal variables, depending on the stated context. In their treatment of money illusion, Shafir et al. (1997) similarly conclude that in “demonstrations of framing effects, people tend to adopt the particular frame that is presented . . . , and proceed to evaluate the options in that frame”. They continue “In other situations, instead of evaluating the options in terms of a single representation, people entertain multiple representations contemporaneously. In such cases, the response is often a mixture of the assessments induced by the different representations, each weighted by its relative salience” (p. 346). An intuitive example of this is the moral (and workplace) tension one would expect from a two-tier pay system created by the attempt to avoid lowering pay to more senior workers, which represents an unfair *loss* to them but not to new workers, while trying to minimize pay differences, which represent unfair pay *levels* to new workers.

A similar effect is illustrated by KKT's question 2 (1986b), version *A* of which I replicated in my surveys with identical results and report here in Table 12 as question *IIA*. For this question, 83% of the 258 (98) respondents to my (KKT's) survey view a decrease in the nominal wage as unfair.¹³ Consider the results to question *2B* from KKT's surveys, here reported as *IIB* as well as question *IIC*, one of my variations on this scenario. In all versions, respondents view both changes and levels of wages. Since losses dominate gains of equal magnitude in the endowment effect, this effect figures more prominently in version *A*. No such loss is imposed in version *B*, where the new worker lacks an endowed wage, or in version *C*, where the wage is increased. Therefore, greater emphasis is placed in these versions on wage levels and on fairness vis-à-vis the wage paid by similar shops to similar workers (although this is probably mediated in version *C* by the unfair shift of surplus between employee and shopowner with a wage increase).

¹³ Note that KKT actually used the slightly different wording “completely fair”, “acceptable”, “unfair” and “very unfair”, which they condensed to “acceptable” and “unfair” in their article.

4. Concluding remarks

This paper has presented a theory of and evidence on unbiased fairness. Despite multiple justice principles and context-dependence, we have seen that mostly disinterested observers (i.e. survey respondents) are usually able to achieve a high and statistically significant level of consensus about just allocations consistent with the theory. Nevertheless, we conclude with a caveat about fairness biases. Often those evaluating the justice of an allocation are also *stakeholders*, i.e. they also have a stake in the outcome. In contrast to disinterested observers, stakeholders are motivated to construe justice in their own favor, which often results in *self-serving distortion* of justice. One can identify two such types of distortion. First, people may exhibit partiality in interpreting justice principles and context in order to deceive themselves, that is, they may engage in *self-serving self-deception*. According to the theory and experimental evidence in Konow (2000), such self-deception reduces the disutility of pursuing self-interested but unfair allocations caused by the fairness preference. Second, justice may be distorted, not to deceive oneself, but to deceive others. Stakeholders may engage in *mimicry*, i.e. they may appeal to specious and self-serving claims about justice in order to deceive others and exploit others' sense of justice. Whatever the source of distortion, one must maintain an awareness that claims about justice by stakeholders are likely tainted by self-interest. The presence of self-serving distortion is significant obstacle to understanding unbiased justice, and its neutralization, where possible, a most useful measure to removing that obstacle.

This paper presents a theory of unbiased fairness that goes beyond previous work by extending one principle of justice, expanding the theory to incorporate two others, providing a preference function for weighting the principles, clarifying different uses of justice terminology (senses of justice) and identifying various ways in which justice evaluation is context-dependent. A solid positive theory of unbiased fairness (which this strives to be) has important implications for how much of economic theory, empirical economics and economic policy should be conducted. First, such a theory is necessary for a general understanding of economic phenomena that are impacted by people's concern for justice, such as with labor markets (e.g. strikes and slowdowns), industry regulation (e.g. rate setting in regulated utilities), perceived price gouging (e.g. price increases during disasters) and even international trade (e.g. protests against the IMF and World Bank for alleged exploitation of the poor). Second, a solid theory of unbiased fairness may help identify fairness biases and specious claims based on fairness. This allows one not only to distinguish self-serving distortion, but to use that information, where appropriate, in formulating economic policy. Finally, welfare economists and moral philosophers may find their pursuit of a normative theory of justice benefits from a well-stated positive theory of justice. A descriptively accurate theory of "justice behind a veil of ignorance" provides a compelling framework for a prescriptive theory of justice as well as an important standard against which to measure the relevance of normative theories.

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