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WHAT IS FAIR? EXPERIMENTAL EVIDENCE

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WHAT IS FAIR? EXPERIMENTAL EVIDENCE

David L. Dickinson and Jill Tiefenthaler

ABSTRACT

There has been growing interest within the economics discipline in the role of equity concerns in the distribution of resources. This paper presents empirical evidence from a series of controlled laboratory experiments where third-party decision-makers must allocate resources between two individuals. The experimental results indicate that subjects view a wide range of different allocations as the fair distribution of resources. However, regression analysis indicates that both treatment effects and a few demographic variables explain some of this variation in fairness concepts. Most significantly, decision-makers rewarded subjects who earned their favorable positions and the gender of the decision-maker was an important predictor of the allocation chosen.

JEL classification codes: D63, C91, Z00

Key words: fairness, equity, experiments

WHAT IS FAIR? EXPERIMENTAL EVIDENCE*

I. Introduction

While economists have traditionally focused on efficiency, there has been a growing interest within the discipline in the role of equity in the distribution of resources. Concerns about fairness are present in many different economic environments, and the desire to achieve a “fair” outcome has been offered as an explanation for many outcomes that do not support the theoretical predictions of purely self-interested utility maximization. In fact, a growing body of experimental evidence makes a strong case against the pure selfish rationality model as subjects are consistently willing to exchange personal gain for a “fair” allocation. Ideas about fairness are perhaps even more important when the decision-maker does not directly benefit from the allocation. In such cases, the third party’s notion of fairness is likely to completely determine the allocation. Examples of such environments include conventional arbitration, the household allocation of scarce resources, bankruptcy settlements, and estate division.

This paper presents empirical evidence from a series of controlled laboratory experiments that fit the above-mentioned scenarios. It is the first set of experiments, to our knowledge, that focus exclusively on individual preferences over payoffs to *other* individuals. The final cash payoff of two individuals (recipients) in our experiments is determined by a decision-maker whose cash payoff is independent of the allocation of scarce tokens. These tokens are inputs that determine final cash payoffs to the recipients via differing payoff functions. Therefore, a simple 50-50 split of the tokens is not necessarily evident since this allocation would lead to different final cash payoffs for the recipients (see Section III for more details on the design). Our design, coupled with subject anonymity ensures that the decision-maker’s notion of a fair allocation is what determines the division of tokens.

*We thank Kellyn Smith for excellent assistance in both recruiting subjects and running the experiments. Valuable comments are acknowledged from the participant in the Colgate University/Hamilton College seminar series. We also thank Colgate University for funding the experiments for this study.

We explore how fairness perceptions may be affected by both context of the environment as well as whether one recipient “merits” an advantageous position relative to the other recipient. Additionally, we collect demographic information on each subject so that we can further investigate any demographic as well as treatment determinants of fairness beliefs. Context (or framing) and gender effects on perceptions of fairness have been previously explored in bargaining and public goods environments. However, our focus solely on the third-party preferences over payoffs of other individuals is novel and relevant to understanding at least a great number of decisions made by judges, arbitrators, head-of-household allocators, department managers, etc. Our collection of a larger range of demographic variables allows us to use regression analysis to examine whether or not there is any systematic relationship between an individual’s fairness standard, her characteristics, and the context of the decision-making environment.

Consistent with existing studies, our results indicate that the context of the scenario matters. Shogren [1989] and Cooper et al. [1999], among others, note that context is an important determinant of decision-making outcomes. Our experiments show that when an otherwise generic division of tokens is framed as a division of an inheritance, an equal split of the tokens is significantly more likely, while an equal final outcome for the recipients is less likely. Also, when a subject earns the right to the more favorable payoff function (versus random assignment) an equal final outcome allocation is significantly less likely. We also find that men are significantly more likely to choose the allocation that maximizes total payoffs as are, curiously enough, students who have taken more economics classes.

These results have numerous policy implications. That earning the right to a more favorable position affects an outsider’s perception of fairness would explain many courtroom

dialogues. Put differently, if one can be cast as a victim who is undeserving of a less favorable position, an outsider's perception of how to fairly treat the victim is more likely that of equal outcomes—a topic of debate in perhaps most divorce settlements. Another implication stems from our result that men are significantly more likely to choose the most efficient outcome. Given this, men and women are likely to view the justice of court decisions, transfer policies, and even the household distribution of resources differently. Lundberg, and Pollak (1996) note the widely accepted hypothesis that “kids-do-better” when women allocate resources versus when men allocate resources in the marriage. While their reference is to whether or not kids or adults receive more resources depending on who allocates (as opposed to different allocations among children), the importance of the third-party allocation rule is highlighted by such hypothesis.

It is important to note that while our experiments focus on decisions made by unaffected third parties, they are applicable to many other situations. We purposely design our experiments so that the decision-maker has nothing to gain from the allocation chosen in order to isolate the fairness concept. However, fairness concepts that dominate in this scenario are also likely to be important when the decision-maker has something at stake. Understanding the importance of considerations for fairness in limiting self-interested behavior requires a basic understanding of what people think is fair.

The rest of this paper is organized as follows. We briefly survey the relevant fairness literature in Section 2. Section 3 of the paper outlines the experimental methodology used for this study and discusses the demographic questionnaire. In Section 4, we present the results from the experiments—we present both summary statistics as well as the regression results examining the influence of treatment and demographic variables on the chosen allocations.

Finally, in Section 5 we discuss what the results say about fairness considerations and suggest some policy implications.

II. Fairness in the Literature

What is fair? The theoretical literature on fairness has shown that there are many potential fair allocations with each meeting a different set (but not all) of widely accepted axioms (such as envy-freeness, anonymity, and Pareto optimality). The theoretical literature on fairness makes it clear that in any situation there are many allocations that could be considered as fair. However, which of these perceptions of fairness are actually held by real people? There is a paucity of research on this subject. However, the general perception among researchers is that a dominant fairness concept does not exist and fairness concepts differ widely with the context of the situation and the individual. Konow [1996] argues that the dispersion in fairness concepts is not that chaotic. His argument is that all people are influenced by the same three framing criteria – accountability, altruism, and efficiency – when determining a fair allocation. The dispersion in what people report as fair simply results because people weigh these criteria differently when making their decisions.

Konow's "accountability principle" states that an unequal distribution is fair if the individual with more has earned his superior position. However, that same distribution is not fair if the individual with more was simply lucky. The notion that effort matters to people is supported by the social psychology literature where the "contributions rule" is seen as an important determinant of fairness. Konow's survey results support the accountability principle. In addition, experimental evidence from Hoffman and Spitzer [1985], Guth [1988], Hoffman et al [1994], and Burrows and Loomes [1994] support the notion that differential payoffs are seen

as fair if linked to effort. Hochschild [1981] finds that effort is a key criterion in whether or not government inter-household distribution policies are seen as fair by the American public. There is much less evidence on the importance of need and efficiency in forming fairness considerations. Need is offered as an important fairness criteria by the social psychology literature. The “needs rule” implies that those at the bottom be brought up at the expense of those at the top. Engle [1988] points out that need is likely to be a particularly important criteria when an individual is severely constrained. Konow [1996] presents some evidence from his survey that concerns for efficiency influence what people view as fair.

In addition to the importance of context, fairness concepts (or the weight given to the three criteria proposed by Konow) may also differ across individuals. Culture, background, and other personal characteristics may influence an individual’s morals and values and, therefore, her notion of fairness. Evidence from the interdisciplinary literature on fairness finds that gender, education, and cultural background affect what an individual thinks is fair. Harbert and Scandizzo [1982] find that education increases the likelihood that a mother splits resources equally among her children. In reviews of the social psychology literature, Engle [1988], and Engle and Nieves [1993] find that women are more likely to split resources equally than to follow a contributions rule and that equal split is more likely to be the norm in noncapitalistic cultures.

Experimental economics research has further substantiated such gender effects. Croson and Buchan [1999] find that women reciprocate more than men in East Asian countries as well as in the U.S. Eckel and Grossman [1998] survey numerous studies that have shown somewhat mixed gender effects, but their result is that women are less selfish than men in double-

anonymous (anonymous from counterpart and experimenter) dictator games.¹ Andreoni and Vesterlund [1999] find that women are more likely to equalize payoffs whereas men are more likely to maximize total payoffs. The weight of the evidence points towards women being more interested than men in equalizing payoffs.

The existing research, however, focuses on fairness when decisions directly and explicitly affect the decision-maker. Our study of third-party allocations is important not only to address another class of decision-making environments, but also to remove the vested-interest present in other allocation decisions. This is perhaps quite important in understanding an individual's unbiased perception of what a fair allocation is.

Farmer and Tiefenthaler [1996] theoretically examine a third-party allocation problem of parents' allocating food among their children. The authors point out the potential fairness concepts that likely exist in this simple problem of dividing a single, perfectly divisible good. Standard possibilities for fairness include equal split, proportional split, and equal loss of the resource. Equal and proportional split refer to how the resource is divided among two parties, either equally or in proportion to the individual's needs, respectively. Equal loss applies when two parties each make a claim for an item that cannot be simultaneously satisfied. It may then be fair to give each party less than the original claim (i.e., a loss) to each party. For environments where the allocated item is an intermediate good to the production of some final item of value, we actually have six fairness possibilities to consider. Equal split, proportional split, and equal loss can be applied to the allocation of outputs as well as inputs, as noted by Farmer and Tiefenthaler. Children, for example, all require food inputs, but how they turn the food into

¹ The dictator game involves a "dictator" choosing how an amount of money will be divided amongst him/herself and the unfortunate nondictator.

health varies and, therefore, children given equal amounts of food will have different health outcomes. Is fairness then an equal plate of food or an equal final health outcome?

III. Methodology

A. Experimental Design

The choice of controlled experimentation for our data generation stems from the difficulties involved in finding an appropriate existing data set to study fairness concepts. While much of the empirical interdisciplinary literature on fairness relies on survey data, economists are skeptical of what people say when there are no consequences to their decisions. While controlled experiments do not represent naturally occurring environments, such experiments are still valid given that subjects are making real economic decisions. Additionally, there are offsetting benefits to using experiments. With an appropriate experimental design we can generate data tailored to our investigation of 3-party fairness allocations. The controlled nature of the design means that decisions are made in an environment free of the confounding factors that can affect the quality of data from field studies. Further, to the extent that our subjects (college students) differ in their demographics, we can control for the personal characteristics of our subjects through regression analysis. Finally, our experiments are a cost-effective way of gathering data—we incur a per observation cost of about \$11 in these experiments.

In order for our experimental design to capture the essential decision-making elements of the 3-party allocation problem described in the introduction, we must have the following:

- (1) A decision-maker divides scarce resources between two beneficiaries.
- (2) The decision-maker's utility (associated with the decision) should depend only on the allocation made. That is, no post-decision transfers occur. Beneficiaries' utility depends on the amount of the resource received and their capacity to convert resource inputs into final outcomes.

- (3) Beneficiaries differ in their capacity to convert the resources into final (utility) outcomes, and this capacity is private information among beneficiaries.
- (4) Beneficiaries know how the resources were allocated among them, but each beneficiary does not know the final outcome of the other beneficiary.
- (5) The decision-maker knows that the beneficiaries will see how the resources were allocated among them, and he also knows that each beneficiary will not know the final outcome of the other beneficiary.

As such, what really elicits the decision-maker's concept of "fairness" is that he must unequally divide the resources in order to equalize final outcomes. Each beneficiary, on the other hand, only sees the resource allocation and not the final outcome of the other beneficiary (and the decision-maker knows it).

Our experimental design consists of four distinct treatments. The separate treatments, to be discussed shortly, are meant to explore different facets of the same basic decision-making environment. The heart of each experiment (i.e., a session of a particular treatment) is that a decision-maker makes a decision affecting the financial payoffs of two beneficiaries (Players B and C). The decision-maker is asked to divide 60 hypothetical units between two beneficiaries. The decision-maker is given a payoff table (see Appendix A) that shows how different allocations generate different outcomes for the beneficiaries, and the decision-maker knows that these outcomes are used to determine the experimental cash payoff for the beneficiaries. The payoff tables are generated from the functions $U=30f_1-(.5f_1)^2+300$ for Player B, and $U=80f_2-.25f_2^2$ for Player C, where f_i refers to units of the input allocated to the individual (payoffs are truncated to be whole numbers). While derived from the health production function of Farmer and Tiefenthaler (1995), our decision-maker has a finer grid for allocations than in their paper—60 versus 30 tokens to allocate. We choose these payoff functions as the basis for our experiments for two reasons: First, linear payoff functions would limit the number of

fairness concepts we can identify from subject decisions. Secondly, potentially confused subjects (ultimately less than 5%) are identifiable with these payoff functions as all allocations giving less than 20 tokens to Player B are pareto inefficient—giving more to Player B increases both beneficiaries' payoffs.²

The decision-maker is paid a flat fee of \$10 for participation in the experiment. So, unlike most experiments where there is a mapping of decisions to one's own monetary payoff, the only thing motivating the decision-maker's behavior is the knowledge that his decision affects the payoff of each of the beneficiaries. In other words, the decision-maker's concept of fairness determines the payoffs of the beneficiaries.³

The decision-maker is informed that the beneficiaries are shown the division of inputs, but the beneficiaries do not see the payoff table or the payoffs received by the other

² Farmer and Tiefenthaler note that several of their alternative fairness concepts would have no meaning unless the payoff functions reach a maximum. A quadratic function is therefore chosen as the simplest function to attain a maximum. One drawback, however, of the chosen functions is that when Player B and C's payoffs are equalized, it is also the allocation that maximizes Player C's payoffs. This may limit our ability to examine whether allocators wish to equalize payoffs or merely maximize Player C's payoffs. Nevertheless, since players were all anonymous in the experiment, we strongly believe that such allocations are payoff-equalizing allocations as opposed to trying to maximize the payoff of an unknown individual. Besides, less than 2% of decisions maximize Player B's payoff, and so one would expect many more such allocations if individuals were somehow systematically trying to maximize payoffs of Player B. The weight of the evidence suggests that allocators equalize beneficiaries' payoffs by intent and *not* as a byproduct of attempting to maximize Player C's payoffs.

³ In actuality, we use several decision-makers for each beneficiary, but this is unknown to the subjects. The existence of multiple decision-makers per set of beneficiaries is used to lower our per-observation experimental costs and allow collection of a larger sample size. We strongly emphasize, however, that no deception is used in the experiments, and the decision-makers are completely aware that the decision made will affect *real* cash payoffs of the beneficiary. In fact, we purposefully avoid lying to the subjects and, as a result, we use and pay real beneficiaries in these experiments even though they make no decisions. Each decision-maker is told that the decision made will affect the cash payoffs of the beneficiaries that he/she is matched with. Nothing in the language of the instructions informs the decision-maker (or insinuates) that more than one decision-maker's decisions are used to determine the experimental (cash) payoff to the beneficiaries. Since allocations lead to large payoff numbers (from 0 to 1200), decision makers are told that an exchange rate will be applied to the experimental payoff number "...to determine the dollar payoff that you generate for Players B and C" (the beneficiaries). While the exchange rate is not disclosed, it is stressed that each experimental payoff point is worth a certain amount of cash, and that a higher (lower) payoff number represents more (less) cash to the beneficiary. The *exact* language of the instructions is contained in Appendix B.

Finally, subjects could not deduce that there were multiple decision-makers per pair of beneficiaries as subjects were seated so they were not facing each other during the experiment. Additionally, *all* subjects (including beneficiaries) were given experimental instructions to read through and a questionnaire to complete, and so it was never the case that the beneficiaries were "just sitting there" while others were reading and making decisions.

beneficiaries.⁴ After all decision-makers make their allocations (our sessions usually involved about 16 decision-makers at a time to economize on experimental time and costs), each beneficiary is shown the input allocation of the decision-maker, his own outcome, the experimental exchange rate, and his own monetary payoff. Beneficiary #1 never knows the outcome or the cash payoff to Beneficiary #2 (and vice versa). Rather, the only piece of information that each beneficiary knows about the other is the input allocation decision of each decision-maker. Note that the beneficiaries make *no* decisions in the experiment. Finally, all subjects are paid in private and in cash at the end of the experiment.

Four distinct treatments are used to examine two separate issues. First, does the context of the decision affect the fairness concept of the decision-maker? Secondly, when beneficiaries earn or deserve their initial positions (i.e., the capacity to turn resources into final outcomes), do decision-makers exhibit different fairness concepts? We implement these treatments by using four different sets of instructions.⁵

The first set of instructions utilizes neutral language. Units are “tokens”, and outcomes are “player payoffs”. By doing this we create a generic environment where the experiment is simply a decision to be made with no specific context. Decision-makers are also told that the beneficiaries are randomly assigned. We call this treatment *Generic/Random*.

The second experiment refers to the decision-makers as “parents” and the beneficiaries as “children”. The allocation problem is for the parent to distribute 60 units of food (tokens in the generic experiment) among two children and the outcomes are the children’s health. Children

⁴ The payoff table is not shown to the beneficiaries to identify those decision-makers who view an equal division of inputs as fair even though the resulting payoffs would be unequal. In other words, if beneficiaries see the payoff table, the decision maker then knows that the beneficiaries are aware that an unequal division of inputs is required to equalize cash payoffs. Without seeing the payoff table, beneficiaries may perceive that same unequal division of the inputs as unfair, and this may affect how decision-maker chooses to allocate the tokens.

⁵ All experimental instructions are available from the authors by request, and some are included in Appendix B.

are still randomly assigned in this experiment. We refer to this treatment as *Food/Random*.

Notice that in both of the random treatments, the beneficiaries have not earned their respective payoff functions. *Food/Random* is a framed version of the *Generic-Random* treatment.

Allocation decisions may be different if the decision-makers view the beneficiaries as having earned the right to their position. As such we also use a neutral-language set of instructions with non-random assignment of the two beneficiaries. Prior to assignment, the two beneficiaries (who are randomly chosen from among all subjects) are given a five-question quiz. The subject who scores higher on the quiz is designated as Player B, and the other is Player C.⁶ Players A (the decision-makers) may view this particular environment as one in which Player B earned the right to the more favorable payoff function. We call this treatment *Generic/Earn*.

The fourth treatment once again casts subjects as parents and children. The instructions describe the problem as one of dividing an inheritance among two children, and children each have a “wealth” payoff function. Child #1 is described as financially responsible, always having made good financial decisions, whereas Child #2 is described as relatively worse-off financially, and in that position due to poor financial decision-making in the past. We do this to recreate the sense of potentially having “earned” the more preferred (wealth) payoff function. The actual assignment of the children is done by our five-question quiz as in *Generic/Earn*. This treatment, called *Bequest/Earn*, is therefore our framed version of *Generic/Earn*.

The 2x2 matrix below summarizes the full experimental design.

Design Matrix

⁶ To avoid a selection problem among subjects, we employ the procedure developed by Ball and Eckel (1998). Even though the recipients make no decisions in the experiment, we create the quiz so that all answers are numeric, and the final quiz score is merely the sum of all answers. As such, all subjects (Players A, B, and C) are told that the subject (from Player B and C candidates) scoring highest on the quiz is Player B. Note, however, that this “highest score” has nothing to do with intelligence, unbeknownst to the subjects.

	Earned Rights	Random Assignment
Framed Decision	<i>Bequest/Earn</i>	<i>Food/Random</i>
Non-Framed Decision	<i>Generic/Earn</i>	<i>Generic/Random</i>

Based on our earlier discussion of fairness concepts, we can establish several hypothesis about subject behavior within the context of the experimental design. To start, we can note that, while an equal division of the inputs would lead to a 30/30 allocation to Player B/Player C, the allocation required to equalize final payoffs is 20/40—perhaps the most focal allocations highlighted in Farmer and Tiefenthaler.⁷ Without context and without earned rights to the “better” payoff function of Player B, we expect a baseline allocation of 20/40 since it generated equal payoffs to both subjects. Our *context hypothesis* is that the context of the decision-making environment will affect allocations. To be more specific, we need to talk of a particular context. Based on results from the bequest literature, for example, our context involving inheritance divisions would more likely lead to an equal division of the inputs. Our *earned-rights hypothesis* is that allocators will favor the individual having earned the right to be Player B. A focal possibility is that 30/30 allocations are more likely. More loosely, we expect an allocation of greater than 20 tokens to Player B to be more likely. Our collection of demographic information will also allow us to explore whether or not any systematic affects on allocations are the result of subject demographic differencnts.

Our experiments were conducted at Colgate University during the Fall 1998 and Spring 1999 semesters. Our subjects were undergraduate students recruited from a wide variety of

⁷ The other fairness concepts from Farmer and Tiefenthaler are as follows: Proportional split of inputs=36/24; Equal loss of inputs=40/20; Proportional output (rounded to the nearest allocation)=35/25; Equal loss of output (rounded to the nearest allocation)=37/23. We anticipate these allocations being less obvious to the subjects due to

courses. We attempted to elicit as wide a subject pool as possible within the limitations of the university, and we specifically limited the extent to which we recruited subjects from economics courses.⁸ Total experimental costs were approximately \$3,600 (including pilot experiments). Decision-makers earned a flat fee of \$10 for participation and beneficiaries received about \$10 on average varying from a low of \$8 to a high of \$10.75. The experiments lasted approximately 25 minutes, and so the subjects were paid quite well relative to other earnings opportunities. We gathered 314 total observations, and these were roughly equally divided among each of the four treatments.

B. Demographic Data

In order to investigate the determinants of an individual's notion of fairness, we asked each decision-maker to fill out a short demographic questionnaire (see Appendix B) after the completion of the experiment. Each individual's questionnaire was matched to his allocation using a numbering system. In a review of the social psychology literature, Engle (1988) notes that the relevant fairness concept may depend on the resource being distributed as well as the characteristics and values of the decision-maker. Therefore, regression analysis of the determinants of the allocation chosen should include both treatment effects and some demographic characteristics of the subjects as right-hand-side variables. Demographic information was collected on gender, year in college, residence (regional and urban/rural), college major, work status, receipt of financial aid, number of economics courses taken,

their more complicated calculation. The equal split of inputs=30/30 and equal output=20/40 allocations are simple to calculate and therefore more likely to be used as simple rule-of-thumb allocations.

⁸ Economics is, however, one of the most popular majors at Colgate University. As such, many of the subjects recruited from other courses may still list economics as their intended Major on our demographic questionnaire.

attendance at religious services, race, number of siblings, performance of volunteer work, and affiliation with a fraternity or sorority.

IV. Results

A. Fairness Outcomes: What are the dominant choices?

Table 1 shows the summary data from our experiments. Decision-makers could choose any token allocation from 0/60 to 60/0 in one token increments, although Table 1 only shows the allocations chosen at least once. Decision-makers chose a wide variety of different token allocations. Column two shows the choices made across all treatment, and we see that thirty-two of the possible sixty-one token allocations were chosen by at least one subject. However, three allocations stand out as modal choices. If we refer to the beneficiaries as Players B and C (Player C having the “better” payoff function), then the modal allocations of tokens to Player B/Player C are 20/40, 30/30, and 34/26. The first two token divisions are, perhaps not surprisingly, the equal (payoff) outcome and the equal split allocations, respectively. An allocation of 20 tokens to Player B and 40 tokens to Player C gives both players the same payoff because Players B and C have different payoff functions. An equal split of tokens (30/30) gives Player C a higher payoff. Together these two allocations—the equalization of inputs and the equalization of outcomes—account for over 60% of the allocations chosen for all treatments combined.

Roughly 9% of the decision-makers chose the outcome 34/26 that maximizes total output. While this particular allocation is the most efficient (the most output is created from the 60 tokens), it gives Player B a greater share of the tokens and a greater final payoff than Player C. In addition to these three obvious modal choices, ten subjects (3%) chose 40/20 as the fair

TABLE 1
Frequency of subject choices (allocations chosen at least once are listed)

Tokens to B/Tokens to C	Aggregate Frequency	Frequency by Treatment			
		<i>Gen/Random</i> Freq (%)	<i>Gen/Earn</i> Freq (%)	<i>Food/Random</i> Freq (%)	<i>Beq/Earn</i> Freq (%)
0/60	2 (.64)	1 (1.28)	1 (1.27)	---	---
1/59	1 (.32)	1 (1.28)	---	---	---
10/50	4 (1.27)	2 (2.56)	1 (1.27)	---	1 (1.28)
13/47	1 (.32)	---	1 (1.27)	---	---
14/46	1 (.32)	---	---	---	1 (1.28)
15/45	2 (.64)	---	---	---	2 (2.56)
18/42	2 (.64)	---	1 (1.27)	1 (1.27)	---
19/41	1 (.32)	---	1 (1.27)	---	---
20/40	139 (44.27)	48 (61.54)	36 (45.57)	42 (53.16)	13 (16.67)
21/39	2 (.64)	---	2 (2.53)	---	---
22/38	3 (.96)	---	---	2 (2.53)	1 (1.28)
23/37	3 (.96)	2 (2.56)	---	1 (1.27)	---
24/36	2 (.64)	1 (1.28)	---	1 (1.27)	---
25/35	6 (1.91)	---	1 (1.27)	3 (3.80)	2 (2.56)
26/34	2 (.64)	---	1 (1.27)	1 (1.27)	---
27/33	1 (.32)	---	1 (1.27)	---	---
28/32	9 (2.87)	2 (2.56)	5 (6.33)	1 (1.27)	1 (1.28)
29/31	5 (1.59)	---	2 (2.53)	2 (2.53)	1 (1.28)
30/30	52 (16.56)	3 (3.85)	3 (3.80)	5 (6.33)	41 (52.56)
31/29	5 (1.59)	1 (1.28)	1 (1.27)	1 (1.27)	2 (2.56)
32/28	9 (2.87)	---	2 (2.53)	6 (7.59)	1 (1.28)
33/27	7 (2.23)	---	4 (5.06)	2 (2.53)	1 (1.28)
34/26	28 (8.92)	9 (11.54)	8 (10.13)	6 (7.59)	5 (6.41)
35/25	5 (1.59)	---	2 (2.53)	2 (2.53)	1 (1.28)
36/24	1 (.32)	---	---	---	1 (1.28)
37/23	1 (.32)	1 (1.28)	---	---	---
38/22	2 (.64)	1 (1.28)	1 (1.27)	---	---
39/21	1 (.32)	---	1 (1.27)	---	---
40/20	10 (3.18)	2 (2.56)	2 (2.53)	2 (2.53)	4 (5.13)
41/19	1 (.32)	1 (1.28)	---	---	---
45/15	1 (.32)	---	1 (1.27)	---	---
60/0	5 (1.59)	3 (3.85)	1 (1.27)	1 (1.27)	---
Total	314	78	79	79	78
Observations					

allocation of tokens. Given the payoff functions faced by decision-makers, this allocation represents the fairness concept termed “equal loss of inputs” by Farmer and Tiefenthaler. Under equal loss, tokens are distributed so that both beneficiaries lose an equal amount of the input as compared to the input amount that would maximize each player’s payoff.

Columns three through six of Table 1 shows the frequency of allocations broken down by treatment. Even at the treatment level there is a wide variety of allocations chosen. However, the variance of allocations chosen for each treatment is lower than that for the total sample. Nine, 16, 13, and 12 different allocations were chosen in the *Generic/Random*, *Generic/Earn*, *Food/Random*, and *Bequest/Earn* experiments, respectively. What is perhaps most interesting is that the modal choice for three of the four treatments is the equal outcome allocation (20/40). More than 50% of subjects chose an equal outcome in the two experiments where the recipients were randomly assigned their payoff functions and 46% of subjects chose this allocation in the generic experiment where recipients “earned” their functions. However, the modal choice for the *Bequest/Earn* treatment is an equal split of inputs. More than half of the subjects in the bequest/earn experiment chose an equal split of resources. This result is consistent with actual bequest data. Data in both Menchik [1980] and The Royal Commission [1977] indicate that a significant proportion of parents, though not all, split their bequests equally among their children.

The theoretical literature on fairness proposes that accountability or effort is an important criteria considered by individuals trying to make a fair allocation. It is seen as fair for an individual who earns a dominant position to enjoy the rewards. However, it is not seen as fair for an individual to enjoy greater rewards if his dominant position was just lucky. Our results join a few other empirical studies in support of this notion. In both experiments that framed Player C as having been randomly assigned her superior payoff function, the majority of subjects

thought that it was fair to generate equal final outcomes even though this implied an unequal allocation of the inputs among Players B and C.

B. Regression Results

Given that notions of fairness differ across individuals, it is interesting to examine whether or not this variation is in anyway systematic. Does the scenario influence the allocation chosen? Do fairness concepts differ by gender or race? In order to estimate the determinants of our subjects' allocations, regression analysis is performed. The dependent variable is coded as 1, 2, 3 or 0 representing the three modal choices (equal outcome, equal split, and maximum output) and all other allocations, respectively. Several alternative specifications of the dependent variable were tried and the results were robust across these specifications.⁹ Given that the dependent variable is qualitative and that the ordering of the fairness concepts is not important, the appropriate estimation technique is multinomial logit regression. The multinomial logit results are presented in Table 2. The marginal effect of each variable (evaluated at the sample mean) is presented for each of the four categories. The model correctly predicted 57 percent of the cases.

As expected, the treatment has a significant impact on the allocation chosen in several cases. Relative to the *Generic/Random* experiment, an allocation of resources that results in

⁹ Six alternative specifications of the dependent variables were estimated. Initially the dependent variable was coded from 0 to 5 with pareto inefficient allocations and equal loss (20,40) represented as separate categories. However, all right-hand-side were insignificant in predicting the choice of these two categories and they were, therefore, folded into the other category. None of the results for the three remaining modal choices were significantly affected by this change. Another specification included allocations around the modal choices with the modal choice categories. Again, this change in the dependent variable did not significantly alter the results.

equal outcomes is significantly less likely if the scenario is framed as if the recipients earned their positions. In both the *Generic/Earn* experiment and the experiment framed as a parent distributing her bequest among a productive and an unproductive child (*Bequest/Earn*), subjects

TABLE 2
Multinomial Logit Results (N=314)

	Equal Outcome	Equal Split	Maximum Output	Other
Constant	0.448**	-0.069	-0.051	-0.328*
Exp. #2 – Generic/Earn	-0.133*	-0.003	-0.039	0.175*
Exp. #3 - Food/Random	-0.084	0.038	-0.037	0.084
Exp. #4 – Bequest/Earn	-0.435**	0.261**	-0.017	0.191*
Financial aid	-0.008	0.004	0.020	-0.016
Minority	-0.094	-0.053	-0.009	0.156
Greek membership	-0.117	0.049	-0.011	0.080
Majoring in a social science	0.053	-0.056	.022	-0.019
Majoring in a natural science	-0.096	-0.105*	0.057	0.144
Number of siblings	-0.001	0.002	-0.004	0.002
Attends religious services	0.028	0.049	-0.063	-0.015
Urban	0.045	-0.025	-0.056	0.036
Rural	-0.087	0.047	-0.035	0.075
Works > 5 hours per week	0.004	0.019	-0.037	0.014
Years at Colgate University	0.040*	-0.021	-0.036	0.017
Male	-0.167**	-0.039	0.074**	0.131*
Number of economics classes	-0.015*	0.020*	0.021**	-0.026
Northeast	0.006	-0.087*	-0.022	0.104
Volunteers	-0.078	0.018	0.054	0.006

* Significant at the 10% level

** Significant at the 5% level

are less likely to view an equal final outcome as fair. This is in support of our *earned-rights hypothesis*, and is consistent with existing research (e.g. Hoffman and Spitzer [1985], Guth [1988], and Burrows and Loomes [1994]). An equal outcome is just as likely to be chosen when the experiment is framed as a parent distributing food to her equally deserving children (*Food/Random*) as in the *Generic/Random* case. Our *context hypothesis* is therefore met with mixed results. Context, *per se*, may not affect allocations, but certain contexts—a division of money, for example—may elicit different preferences for fairness than others. An equal split of

resources was significantly more likely to be chosen in the bequest experiment than in the other three cases. If the bequest experiment was used, the probability of equal split being chosen increases by 26 percentage points. Maximum output was equally likely to be chosen across all four treatments. However, allocations “other” than the modal choices were more likely in the experiments where Player A earned his favorable position than in the two experiments where assignment was random.

The results indicate that very few of the demographic variables are systematically related to individuals’ notions of fairness. This is an important result. While notions of fairness obviously differ across individuals, it appears that standard demographic variables are not good predictors of these differences. Most demographic variables do not appear to be good proxies for the morals and values that determine an individual’s fairness concept. However, there are a few exceptions. Most notable, gender is a strong and significant predictor in most cases. In our sample, 55% of the decision-makers are female and they are significantly more likely to choose the allocation resulting in equal outcomes, while men are significantly more likely to choose the allocation resulting in maximum output.

The result that the gender dummy variable is a significant predictor the fairness concept chosen brought up the question of whether or not men and women responded to the treatment effects in the same way. While data limitations prevent us from running the multinomial regressions for men and women separately, Table 3 shows the fairness concepts chosen by gender and treatment for comparison.

The frequencies in Table 3 suggest that men and women may view the importance of merit differently when distributing resources. Most notably, when the generic experiment is

changed from a random assignment of payoff functions for the beneficiaries to one where the better payoff function is earned, men are much more likely to view an equal split of resources

TABLE 3
Frequency of subject choices by gender and treatment

	Equal Outcomes	Equal Split	Maximum Efficiency	Other
Men				
Generic/Random	58%	0%	17%	24%
Generic/Earn	44%	35%	5%	16%
Food/Random	43%	5%	14%	38%
Bequest/Earn	13%	50%	6%	31%
Women				
Generic/Random	63%	6%	8%	22%
Generic/Earn	58%	3%	3%	36%
Food/Random	62%	7%	2%	29%
Bequest/Earn	20%	54%	7%	20%

with unequal outcomes as fair. When the payoff functions were randomly assigned, no men chose an equal split as the fair allocation. However, 35% chose equal split once merit was introduced. The distinction between a random and merit-based assignment of payoff functions had a smaller impact on women's choices. In fact, there was no significant difference in the percentage of women who chose the three modal choices between the two experiments.

While we will not speculate on the explanations for these gender differences, we do point out that the notion that women and men have systematically different ideas about what is fair has dramatic policy implications. If they have different notions of fairness, women and men are likely to view the justice of social transfers, court decisions, and family allocations of resources very differently.

Another interesting result is that the number of economics courses taken has a significant impact on the allocation chosen. Students who have taken economics courses are more likely to choose an equal split of resources and an allocation that maximizes total output and are less

likely to choose an allocation that equalizes outcomes. Specifically, a student who has taken 5 economics courses is 10% more likely to choose the equal split or maximum output outcomes. Given all of the discussion in economics courses devoted to efficiency, it is perhaps satisfying as economists to see that students of economics are more focused on efficiency than are other students. This result supports work by Whaples [1995] and Bianchi [1995] who both find that economics training significantly affects an individual's idea of fairness.¹⁰ Whaples finds that taking an introductory course in economics increases the likelihood that a student regards the functioning of the market as fair while Bianchi finds that subjects with economics training behave closer to the selfish rationality model and place less importance on equality when allocating resources. Whether this relationship is the result of economics training or simply a selection issue is not completely clear. However, the causal role of economics training—supported at least in part by data reported in Frank et al [1993]—has some very interesting implications. A few other variables have marginally significant impacts on the allocation chosen. Subjects from the Northeast are less likely to choose equal split, older students are more likely to prefer an equal outcome, and students majoring in a natural science are less likely to split resources equally.

V. Conclusions and Policy Implications

Economists recognize people's concerns for fairness as an explanation for a variety of outcomes that are inconsistent with purely self-interested theoretical predictions. A goal of this paper is to focus attention on an interesting and commonly occurring environment in which perceptions of fairness play a particularly important role. Bankruptcy settlements, estate

¹⁰ Frank et al [1993] also find that economics training appears to limit individuals' willingness to cooperate in a variety of dimensions.

division, intra-household resource allocation, and conventional arbitration are all examples of environments in which a decision-maker chooses an allocation of scarce resources that determines a payoff for two typically heterogeneous individuals. The lack of field data that are free from confounding factors has been at least partially responsible for the lack of empirical work on fairness perceptions in such environments.

We have used controlled laboratory experimentation to identify the most relevant fairness concepts and to study the effects of framing, earned status, and demographic characteristics on perceived fairness. Fairness concepts differ significantly across individuals. Of the 60 possible allocations in our experiments, 32 were chosen. The result is, in itself, significant. Researchers must be careful when making conclusions about people's motivations in distributing resources. Just because an individual chooses an allocation other than the one that the researcher thinks is fair, does not mean that the individual has ulterior motives (for example, preference for one of the individuals or self-interest). However, despite the dispersion in fairness concepts chosen, our results do point to three dominate fairness concepts: (1) an equal split of resources that results in unequal payoffs, (2) an unequal split of resources that results in equal outcomes, and (3) an unequal split of resources that also results in unequal outcomes but does maximize the total outcome. A resource allocation by the government or the courts that relies on one of these methods is most likely to generate popular support.

However, the importance of the three modal choices changes with the framing of the experiment. While an allocation that results in equal outcomes is chosen as the fairness concept by a majority of subjects in the two experiments where the payoff functions are randomly assigned, less than 50% chose this outcome when the payoff functions were "earned" within the context of an inheritance division. In fact, the majority of subjects (53%) who participated in the

experiment framed as a parent distributing her estate between a financially wise child and an unwise child saw an equal allocation that results in unequal outcomes as the fair allocation. The regression results highlight the significant differences that resulted when the experiment was framed in this light. Holding other factors constant, decision-makers are 44 percentage points less likely to allocate inputs to achieve equal final outcomes and 26 percentage points more likely to split resources equally when the experiment is framed as a division of inheritance where the target children earn their relative payoff functions.

The implications of this result are substantial. To summarize it, effort to achieve a favorable position is rewarded by an outside decision-maker, whereas successfully portraying “victim-status” results in an equal outcome allocation. The tenor of many courtroom arguments is evidence that lawyers understand the importance of merit and luck in individuals’ perceptions of fairness. Council for criminal defendants claim that their clients are victims, those representing plaintiffs in lawsuits represent their clients as simply unlucky, and attorneys for those with “deep pockets” make sure that the jury knows how hard their clients have worked for their superior positions. The importance of merit and luck are also considered in the legislative process of making just laws. For example, debate over laws requiring an equal property settlement following divorce often center on whether or not (typically) the wife should be entitled to half of her husband’s wealth. The issue is whether or not she really “deserves” half.

While existing research has shown a difference in men’s versus women’s perceptions of fairness in environments where their own payoffs are at stake—for example, bargaining and public goods environments—our research substantiates this difference even when own monetary payoffs are independent of the allocation. Men are less likely than women to choose equal outcomes but more likely to choose the most efficient outcome. In addition, descriptive analysis

suggests that men are more influenced by whether or not an individual earned his favorable position than women are. These results have dramatic implications for business practices, court decisions, intrahousehold resource allocation, and government transfer policy. Men in positions to allocate resources such as judges, legislators, fathers, and managers may be more likely to allocate scarce resources in order to maximize efficiency. Women in the same positions may be more inclined to divide resources in an effort to equalize outcomes across the affected individuals. However, being male also increases the probability of choosing an allocation other than the modal choices by 13 percentage points. This implies a higher variance of male behavior, which may not be a very desirable quality in managers, judges or others in power.¹¹

Economics training may also determine an individual's perception of training. We find that each additional economics course that an individual takes increases the probability of choosing the most efficient outcome by 2%. Economists may make more efficient managers (though not necessarily the most "fair" in the eyes of the workers), or in general may be more likely to sacrifice other focal outcomes for the most efficient outcome. A male who has taken six economics classes is 20 percentage points more likely to choose the most efficient allocation than a woman with no exposure to economics is. It may be comforting to economists that our students understand the importance of efficiency. However, it is important to recognize that the most efficient outcome may not seem fair or acceptable to those without economics training. In addition, the relationship between the number of economics courses taken and fairness perceptions may be the result of selectivity rather than the training.

Hopefully, the results from these experiments will provide fuel for further discussion and research. While the perception of whether or not individuals earned their positions mattered in our results, our design is not capable of distinguishing between pure framing and the fact that a

¹¹ This higher variance in male behavior is also shown in the dictator games studied in Andreoni and Vesterlund.

story of an inheritance division was told. The fact that there is a significantly increased probability that individuals would allocate inputs evenly in *Bequest/Earn* may have something to do with bequests as opposed to merely any framed version of earned status. More study is needed here to attribute this effect to one particular variable. Also, while we do capture some determinants of behavior in our demographic variables, it is clear that what would be the most obvious demographic controls (other than gender) predict only a small amount of allocation behavior. An interesting extension of this study would use a more diverse subject pool to further explore the effects of demographic variables on fairness notions. There is little variance in race, age, educational status, or income in our subject pool. It would also be interesting to examine the effects of living in a more capitalist versus a more socialist country on perceptions of fairness. While more research is needed in this area, the results from our somewhat homogeneous subject pool clearly indicate that people view fairness differently, and some of the differences can be categorized. The policy implications of these simple results are vast, and so uncovering the different determinants of fairness is a productive and necessary endeavor.

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VII. Appendix A - Player Payoff Tables

Payoffs given correspond to monetary payoffs to Player B and Player C				
Tokens to Player B	Tokens to Player C	Total tokens distributed must equal 60	Payoff to Player B	Payoff to Player C
0	60		300	600
1	59		329	619
2	58		359	638
3	57		387	655
4	56		416	672
5	55		443	687
6	54		471	702
7	53		497	715
8	52		524	728
9	51		549	739
10	50		575	750
11	49		599	759
12	48		624	768
13	47		647	775
14	46		671	782
15	45		693	787
16	44		716	792
17	43		737	795
18	42		759	798
19	41		779	799
20	40		800	800
21	39		819	799
22	38		839	798
23	37		857	795
24	36		876	792
25	35		893	787
26	34		911	782
27	33		927	775
28	32		944	768

Player Payoff Tables-continued

Payoffs given correspond to monetary payoffs to Player B and Player C				
Tokens to Player B	Tokens to Player C	Total tokens distributed must equal 60	Payoff to Player B	Payoff to Player C
29	31		959	759
30	30		975	750
31	29		989	739
32	28		1004	728
33	27		1017	715
34	26		1031	702
35	25		1043	687
36	24		1056	672
37	23		1067	655
38	22		1079	638
39	21		1089	619
40	20		1100	600
41	19		1109	579
42	18		1119	558
43	17		1127	535
44	16		1136	512
45	15		1143	487
46	14		1151	462
47	13		1157	435
48	12		1164	408
49	11		1169	379
50	10		1175	350
51	9		1179	319
52	8		1184	288
53	7		1187	255
54	6		1191	222
55	5		1193	187
56	4		1196	152
57	3		1197	115
58	2		1199	78
59	1		1199	39
60	0		1200	0

Note: Payoff table shown reflects generic language. Payoff table in framed treatment uses terms like: “Units of Food (Inheritance)” and “Health (Wealth) Payoff” in place of “Tokens” and “Payoff”, respectively, in the table above.

VIII. Appendix B – Experimental Instructions (for Generic/Random and Bequest/Earn) and post-experiment Questionnaire

Generic instructions/random assignment of Players B and C (bold type in instructions is in originals that subjects see)

This is an experiment in decision-making. There will be 3 different types of players in today's experiment: Players A, B, and C. **You will be a Player A** for this experiment. As a Player A, you will be paid \$10 for your participation in this experiment. You will be asked to make one decision in this experiment (it will be explained to you shortly). The decision that you make in this experiment will **not** affect your \$10 payoff at all. Your decision will, however, affect the payoffs of the Player B and Player C that you are matched with.

You will be asked to allocate 60 tokens to 2 other players in this experiment, a Player B and a Player C. The decision that you must make is how to allocate these 60 tokens between players B and C. All 60 tokens must be allocated, but the precise way in which they are allocated is completely up to you. You have been given a Payoff Table for Players B and C which describes how different token allocations will determine the payoff that you generate for Players B and C. Please look carefully at the similarities and differences in the payoffs for Players B and C given different token allocations. For example, if you were to allocate 60 tokens to Player B and zero tokens to Player C, then the payoff you generate to Player B would be 1200 and the payoff to Player C would be 0. If you were to allocate zero tokens to Player B and 60 tokens to Player C, then the payoff that you generate to Player B would be 300 and the payoff to Player C would be 600. As a final example, if you were to allocate 13 tokens to Player B and 47 tokens to Player C, then the payoff you generate to Player B would be 647 and the payoff to Player C would be 775.

These payoff numbers do **not** represent dollar amounts, but they will be used to determine the dollar payoff that you generate for Players B and C. After your decision has been made, an exchange rate will be applied to each unit of payoff, and Players B and C will then be paid in cash. In other words, each unit of payoff that a player (B or C) receives will be worth a certain amount of cash to that player. It is important for you to realize that **higher payoffs for a player mean more money for that player** and **lower payoffs for a player mean less money for that player**.

After you have made your decision, Players B and C will get to see the number of tokens allocated to each Player (B and C) (they will never know your identity, however). Further, the Players B and C know that their monetary payoff will be determined in some way by these allocations of tokens. But, **Players B and C will never see the Payoff Table**. Players B and C will only be told how many tokens there were, and how these tokens were divided up between Player B and Player C, and then Players B and C will each receive his/her monetary payoff in private. Neither Player B nor C will know the actual monetary payoff of the other. Each Player B and C will only know what the division of tokens is and his/her personal monetary payoff.

It is important for you to realize that two other individuals are assigned to be Player B and Player C for you in this experiment. These individuals do not choose which Player they get to be in the experiment, but rather it is *randomly* chosen which individual is Player B and which is Player C.

(over)

Your decision is only made once, and no one will know the identity of anyone else in the experiment. Once you have completed your decision in the space below. A monitor will pick up your decisions. You will then be asked to fill out a brief information sheet that will provide valuable information to the researcher. This information will be kept anonymous and confidential and will not affect your payment or future selection for any experiment in any way. **Please raise your hand if you have any questions!** Otherwise, please make your allocation decision now in the space below.

TOKENS ALLOCATED TO PLAYER B _____

TOKENS ALLOCATED TO PLAYER C _____

Thank you, and when all participants are ready, you will be handed a brief information sheet that we would like for you to take a few minutes to fill out.

Instructions framed as bequest decision/earned assignment of Players B and C
(bold type in instructions is in originals that subjects see)

This is an experiment in decision-making. There will be 3 different types of players in today's experiment: a Parent, a Child #1 and a Child #2 (child #1 does not mean this is the youngest or the oldest, we are just giving them a reference number). **You will be a Parent** for this experiment. As a Parent, you will be paid \$10 for your participation in this experiment. You will be asked to make one decision in this experiment (it will be explained to you shortly). The decision that you make in this experiment will **not** affect your \$10 payoff at all. Your decision will, however, affect the payoffs of the Child #1 and #2 that you are matched with. Here is a brief history of Child #1 and Child #2.

Child #1 is in fairly good shape financially. Child #1 is an entrepreneur and works very hard at what he/she does. As such, Child #1 wealthier at the moment, and better able to turn a given amount of inheritance into more wealth (i.e., better investments, smarter investments, smarter spending habits) than Child #2

Child #2 is not as well off at the moment as Child #1. Child #2 is in this position because of he/she has never worked as hard as Child #1, does not make investments as wisely, and is not as good at controlling his/her spending. Child #2 has had all of the same opportunities as Child #1 but has not made decisions as wisely.

In this experiment, we stated that two individuals are assigned to be your "children". These individuals have taken a short quiz at the beginning of this experiment, **and the individual that scored the highest on the quiz is assigned to be the Child #1** with whom you are matched (and the other one is Child #2).

Suppose that you are now faced with the decision of how to divide up your inheritance between your two children. Specifically, you will be asked to allocate 60 units of inheritance to the 2 children in this experiment. Think of each unit of inheritance as representing a certain amount of money—60 units would represent the entire inheritance. The decision that you must make is how to allocate these 60 units of inheritance between Child #1 and Child #2. All 60 units must be allocated, but the precise way in which they are allocated is completely up to you. You have been given a Wealth Payoff Table for Child #1 and #2 which describes how different inheritance allocations will determine the wealth each child will have. Please look carefully at the similarities and differences in the wealth outcomes for Child #1 and Child #2 given different inheritance allocations. For example, if you were to allocate 60 units of inheritance to Child #1 and zero units of inheritance to Child #2, then the wealth outcome for Child #1 would be 1200 and the wealth outcome to Child #2 would be 0. If you were to allocate zero units of inheritance to Child #1 and 60 units of inheritance to Child #2, then the wealth outcome for Child #1 would be 300 and the wealth outcome for Child #2 would be 600. As a final example, if you were to allocate 13 units of inheritance to Child #1 and 47 units of inheritance to Child #2, then the wealth outcome for Child #1 would be 647 and the wealth outcome for Child #2 would be 775.

(over)

These wealth outcomes for Child #1 and Child #2 will be used to determine the dollar payoff that you generate for Child #1 and #2. After your decision has been made, an exchange rate will be applied to each unit of wealth outcome, and Child #1 and Child #2 will then be paid in cash. In other words, each unit of wealth outcome that a child receives will be worth a certain amount of cash to that child. It is important for you to realize that a **higher wealth outcome for a child means more money for that child** and a **lower wealth outcome for a child means less money for that child**.

After you have made your decision, Child#1 and Child #2 will get to see the number of units of inheritance allocated to each of your two children (they will never know your identity, however). Further, the children know that their monetary payoff will be determined in some way by these allocations of inheritance units. But, **your children will never see the Wealth Payoff Table**. The children will only be told how many units of inheritance there were, and how these units were divided up between Child #1 and Child #2, and then each child will receive his/her monetary payoff in private. Neither child will know the actual monetary payoff of the other. Each child will only know what the division of units of inheritance is and his/her personal monetary payoff.

Your decision is only made once, and no one will know the identity of anyone else in the experiment. Once you have completed your decision in the space below. A monitor will pick up your decisions. You will then be asked to fill out a brief information sheet that will provide valuable information to the researcher. This information will be kept anonymous and confidential and will not affect your payment or future selection for any experiment in any way. **Please raise your hand if you have any questions!** Otherwise, please make your allocation decision now in the space below.

UNITS OF INHERITANCE ALLOCATED TO CHILD #1 _____

UNITS OF INHERITANCE ALLOCATED TO CHILD #2 _____

Thank you, and when all participants are ready, you will be handed a brief information sheet that we would like for you to take a few minutes to fill out.

Identification Number: _____

Answer each of the following questions:

1. Sex: MALE FEMALE
2. Graduation year: 1999 2000 2001 2002
3. Region you are from: Northeast South Midwest West Foreign
4. What is your declared or anticipated major at Colgate? _____
5. Location that best describes your home: RURAL URBAN SUBURBAN
6. During the academic year, do you have a regular (5 or more hours per week) job? YES NO
7. Do you regularly attend religious services? YES NO
8. How many economics courses have you taken at Colgate? _____
9. Do you receive financial aid at Colgate? YES NO
If so, how much per year? _____
If you don't know the exact amount, is it more or less than 50% of Colgate's annual cost?
MORE LESS
10. Race: WHITE BLACK ASIAN HISPANIC
11. How many siblings do you have? _____
How many of your siblings are older than you are? _____
12. Do you do some type of volunteer work on a monthly basis? YES NO
13. Are you a member of a fraternity or sorority? YES NO