

## Social Utility and Decision Making in Interpersonal Contexts

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Three studies examined preferences for outcomes to self and a codisputant. Studies 1 and 2 estimated social utility functions from judgments of satisfaction with alternative outcomes. Comparing functional forms, we found that a utility function, including terms for own payoff and for positive and negative discrepancies between the parties' payoffs (advantageous and disadvantageous inequality), provides a close fit to the data. The typical utility function is steeply increasing and convex for disadvantageous inequality and weakly declining and convex for advantageous inequality. We manipulated dispute type (personal, business) and disputant relationship (positive, neutral, or negative) and found that both strongly influence preferences for advantageous but not disadvantageous inequality. A third study contrasted implications of the social utility functions with predictions of individual utility theories.

People care about the outcomes of others. We sacrifice our own interests to help loved ones or harm adversaries. Participants withdraw from profitable participation in a laboratory experiment if they perceive inequity in remuneration (Schmitt & Marwell, 1972). Players in two-person ultimatum games (in which one player proposes a distribution of a fixed amount of money that the other has the option of either accepting or rejecting) frequently reject a positive but inequitable offer even though the alternative is no gain at all (Guth, Schmittberger, & Schwarze, 1982). Negotiations between parties often collapse when one party becomes incensed with the other and attempts to "maximize his opponent's displeasure rather than his own satisfaction" (Seigel & Fouraker, 1960, p. 100). In general, disputants are concerned not only with the outcomes they receive, but also with the outcomes of their opponents (Pruitt & Rubin, 1986).

The importance of interpersonal comparisons has long been recognized by social psychologists. Equity theorists (Adams,

1963, 1965; Homans, 1961; Walster, Walster, & Berscheid, 1978) have argued that people attempt to maintain proportionality between inputs and outcomes to themselves and comparison others. Research on relative deprivation has enumerated preconditions for experiencing deprivation as a result of adverse social comparison (Crosby, 1976). Social comparison theory (Festinger, 1954) has focused mainly on the question of with whom people choose to compare themselves.

Recently, a number of researchers have experimented with different ways of graphically or mathematically encoding individuals' concern for others' outcomes. The main focus of this work has been on decomposing individuals' concern for the outcomes of others into underlying primary motives and graphically depicting these motives using indifference curves, a tool widely used by economists. One of the earliest of these analyses (Scott, 1972) distinguished between three motives underlying concern for other people's outcomes: avarice, altruism, and egalitarianism, each with its own characteristically shaped pattern of indifference curves. Later, MacCrimmon and Messick (1976) proposed that concern for others' payoff could be decomposed into six basic motives, consisting of self-interest (choosing so as to increase own payoffs), self-sacrifice (choosing so as to decrease your own payoffs), altruism (choosing so as to increase the payoffs to the other party), aggression (choosing so as to decrease the payoffs to the other party), cooperation (choosing so as to increase the sum of your payoff and the other's payoff), and competition (choosing so as to increase the difference between your payoffs; see also Griesinger & Livingston, 1973). MacCrimmon and Messick also identified a series of supplementary motives that reflected the assumption of eq-

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uity theory that concern about the other party depends on the ratio of, rather than the difference between, the parties' attainments. Most recently, Lurie (1987) has developed an indifference curve analysis based on the idea that people are concerned with both the difference and the ratio between their own and another party's outcomes.

The indifference curve approach is basically a theory-free tool that permits free expression of preferences. It is useful as a tool for studying preferences, but it has two major limitations. First, it is difficult to make specific behavioral predictions using indifference curves, especially in situations different from those in which the indifference curves were estimated. Second, it is difficult to compare indifference curves to the utility models that have formed the main thrust of work on decision making under uncertainty. An alternative approach that avoids these problems encodes interpersonal preferences using *social utility functions*. Social utility functions specify level of satisfaction as a function of outcome to self and other. Although more restrictive than indifference curves because they impose a specific functional form on preferences, social utility functions permit easier comparison with other decision models such as prospect theory (Kahneman & Tversky, 1979) and make specific behavioral predictions in a wide range of situations.

Although less developed than the work on indifference curves, there has been limited research on social utility. Conrath and Deci (1969) conjectured about different shapes that social utility functions could assume and explored how different basic social motives would manifest themselves in utility function curvature. Other research has empirically estimated social utility functions in different contexts (e.g., Messick & Sentis, 1985). Our research extends the work on social utility in a number of directions.

First, we estimate a separate utility function for each subject. Earlier estimates of social utility functions have fitted a single, aggregate, utility function to all subjects (e.g., Messick & Sentis, 1985). Individual-level estimates permit an examination of the consistency of preferences across decision makers as well as the identification of individual differences in social utility functions.

Second, we examine social and contextual factors that may affect decision making in interpersonal contexts. Although the importance of these factors has been demonstrated in research on social dilemmas (e.g., Orbell & Dawes, 1981), their impact on social utility functions has not been examined systematically.<sup>1</sup> Two important factors that may influence decision making in interpersonal contexts are the nature of the relationship between the individual and the comparison other and the nature of the dispute (dispute type), for example, a business or personal matter. At a simple level, relationships may be dichotomously characterized as positive and harmonious or as negative and disruptive (Heider, 1958; Kelley, 1979). On the basis of prior research (e.g., Walster et al., 1978), one might expect individuals in positive or neutral relationships to value equity. In negative relationships, people may prefer to receive more than the other party (advantageous inequality) and be particularly averse to situations in which the other party receives more than the self (disadvantageous inequality).

The dispute type refers to the issue being negotiated (e.g., a business or personal matter). Lewicki and Litterer (1985) sug-

gested that the norms of a situation affect decision making. For example, with friends and neighbors, the equality norm is expected to prevail (Austin, 1980). However, business transactions often dictate a greater concern for self, with the implicit value being that individuals should maximize their own outcomes. Business disputes generally occur in the context of exchange relationships, whereas personal disputes occur in communal relationships (Clark & Mills, 1979). Exchange relationships are characterized by strict norms of reciprocity, which is expected to be overt, immediate, and typically in kind. Although reciprocity is also important in communal relationships (Thibaut & Kelley, 1959), it is generally less overt and occurs over longer time intervals.

Third, we compare the goodness of fit of a variety of functional forms reflecting different social motives. Earlier research on social utility functions assumed a particular functional form, without testing alternatives.

The functional form that we ultimately estimated has properties that permit a direct comparison to Kahneman and Tversky's prospect theory (1979). A central idea of prospect theory is that people evaluate the utility of alternative courses of action relative to a reference point. Outcomes below the reference point are viewed as losses; outcomes above the reference point are perceived as gains. The reference point represents a state to which individuals have adapted and is usually assumed to correspond to the status quo. However, in an interpersonal context the outcomes of another person may emerge as an alternative (or additional), potentially salient reference point. The prospect theory value function is concave in the region of gains, indicating risk aversion, and convex in the region of losses, indicating risk seeking. A major interest of ours is whether the typical social utility function has a similar shape.

Our studies examined social utility in a dispute context. We were interested in estimating social utility functions that could be used to predict individual behavior in situations, such as negotiations, in which decisions have consequences not only for the self, but also for another party. In Study 1, we performed multiple regressions to estimate a separate utility function for each subject. We examined the impact of the relationship between the disputants and the environmental context on the shape of the utility function. Study 2 extended and replicated the findings from the first study using a separate data set. In Study 3, we used the model specifications from the first two studies to contrast decision making in individual and interpersonal contexts. The primary question addressed in Study 3 is whether the introduction of interpersonal concerns leads to consistent departures from the predictions of prospect theory in competitive decision-making tasks.

## Study 1

### Method

*Subjects and procedure.* A total of 148 subjects participated in the study; 98 were undergraduate students and participated in partial ful-

<sup>1</sup> A recent exception is Lurie (1987). Lurie included a relationship condition comparable to ours in his empirical indifference curve analysis. However, his study used too few subjects to systematically compare the different conditions.

fillment of an introductory psychology course requirement; 50 were students in a graduate management program in a business school.<sup>2</sup>

**Materials and procedure.** The experimenter told participants that the purpose of the study was to examine individuals' reactions to situations involving disputes between two people. Participants were each given a booklet consisting of 10 pages. The 1st page instructed participants to assume the role of the disputant described in each situation. The 2nd page described a dispute between two people. On the 3rd and 4th pages, participants indicated their satisfaction with each of 42 possible outcomes of the dispute by making a slash mark on a scale with endpoints labeled *very unsatisfied* (−5) and *very satisfied* (5). The outcomes described exact dollar payoffs to the self and the other party. The 5th page described a different dispute, and participants rated their satisfaction with outcomes on Pages 6 and 7. The 8th page described a third dispute, and participants rated their satisfaction with outcomes on Pages 9 and 10.

**Design.** Our design included two within-subjects variables: relationship between disputants (positive, negative, or neutral) and dispute type. Dispute type included three conditions, two occurring between people of the same status in a nonbusiness setting and one occurring between a customer and salesperson in a business setting. In one nonbusiness dispute ("invention") two students were faced with the task of splitting the proceeds or costs resulting from a joint invention:

One day while eating lunch, a student who lives in your dorm, Pat, mentioned to you an idea for a new product: cross-country water skis. They are similar to conventional cross-country skis except that they are floatable pontoons that permit you to "ski" over water. Pat thought of the idea several years ago, but had not done anything with it and had not been able to interest anyone in it.

You find the idea of whisking over the water in a standing position exciting. You suggest to Pat that the two of you work together on the project.

Over the next month you spend long hours together constructing a prototype of the water skis in the basement of your dorm. Since it was Pat's idea, you agree to pay for the materials you use to construct the prototype. After extensively testing and refining the skis at the university pool, you decide that you are ready to patent the invention. You hire a patent lawyer to determine whether there is an existing patent on the invention. At your first meeting with the lawyer, he draws up a patent application document for the two of you to examine.

[relationship manipulation goes here]

**Loss:** Several weeks after your meeting with the patent lawyer, he returns with the news that cross-country water skis have already been patented. Nevertheless, you are responsible for paying him for his services. Both you and Pat receive copies of his bill and negotiate how to split the cost.

**Gain:** Several weeks after your meeting with the patent lawyer, he returns with the news that cross-country water skis have already been patented. However, he has contacted the current holder of the patent, who is interested in buying one of the innovative features incorporated in your design. You and Pat agree that the amount offered seems reasonable. The two of you negotiate how to split the profit.

In the other nonbusiness scenario ("lot"), two neighbors split revenue or tax payments from a vacant lot located between their houses. The business dispute scenario ("business") described a conflict between a customer and a sales manager at a computer retail outlet in which the disputants split either the revenue from a retroactive rebate or the cost of repairs. The stimuli for the lot and business disputes are presented in the appendix.

We manipulated the relationship between the two disputants by including details about prior encounters with the other disputant. In the positive relationship condition, participants read a description of a posi-

tive, harmonious relationship between the parties. In the invention dispute, this description read as follows: "In perusing the patent application at home later that day, you find that Pat has listed your name as the primary inventor of the skis. You are pleased, but believe that he really deserves this designation." In the negative relationship condition, participants read a description of a negative, acrimonious relationship between the parties. The text for the invention condition read as follows: "In perusing the patent application at home later that day, you find that Pat has not listed your name on the patent. You feel snubbed since, although it was his initial idea, he had taken it nowhere without your assistance." In the neutral relationship condition, the participants were not provided with any information about the disputants' prior relationship.

We combined the three dispute situations (two personal and one business) with the three relationship conditions using a Latin square design. If we label the dispute situations as *A*, *B*, and *C* and the relationship conditions as 1, 2, and 3, then the three sets of stimuli were composed as follows: (*A*1, *B*2, *C*3), (*A*2, *B*3, *C*1), and (*A*3, *B*1, *C*2). These were randomly assigned to participants.

We constructed 21 positive outcomes by combining 3 outcomes to self (\$300, \$500, and \$600) with 7 outcomes to the other party determined by adding one of seven dollar amounts (−\$300, −\$200, −\$100, 0, \$100, \$200, and \$300) to the amount received by self. As a result, the outcomes to the other party ranged from \$0 to \$900. We constructed 21 negative outcome combinations by expressing the same dollar values as amounts to be paid rather than received. Participants rated their satisfaction with the 21 outcomes involving gains to the self and the other party and then with the 21 outcomes involving losses to the self and the other party for each of the disputes. Because subjects completed these 42 judgments in three different relationship-dispute-type conditions, each subject made a total of 126 judgments. To avoid response set and automatic responding, outcome pairs were randomly ordered on the page; however, all subjects received the same order.

## Results

**Specification of the model.** The first stage of our analysis involved selecting a functional form for the social utility function. We considered three criteria in evaluating different functional specifications: (a) goodness of fit across subjects—the selected functional form should explain a large amount of the variation in an individual subject's ratings; (b) simplicity—it should incorporate a minimum number of explanatory variables; and (c) flexibility—it should be capable of depicting qualitative differences between subjects' patterns of responses. We experimented with several functional forms, each of which included terms for the individual's own payoff and own payoff squared, permitting estimation of both slope and curvature.<sup>3</sup>

The first functional form we examined assumes that people are concerned with absolute level of payments both to self and other. Defining *U* as utility, *SELF* as payoff to self, and *OTHER* as the opponent's payoff, the regression equation is as follows:

$$U = c + B_1\text{SELF} + B_2\text{SELF}^2 + B_3\text{OTHER} + B_4\text{OTHER}^2. \quad (1)$$

<sup>2</sup> There were no significant differences between the two groups on any of the analyses. Therefore, the analyses reported in this study are based on the total sample.

<sup>3</sup> Although there is no reason to assume that a power function expresses the curvature of the utility function better than any other functional form, the amount of data collected and the limited number of values of own payoff that were collected made it impractical to compare the relative fit of alternative second-order terms.

Table 1  
Adjusted  $R^2$  by Relationship and Dispute Type: Study 1

Condition		Equation									
		1		2		3		4		5	
Relationship	Dispute type	$R^2$	$SD$	$R^2$	$SD$	$R^2$	$SD$	$R^2$	$SD$	$R^2$	$SD$
Positive	Invention	.41	.33	.52	.24	.35	.32	.25	.27	.66	.26
Neutral	Invention	.46	.33	.55	.25	.30	.32	.31	.25	.65	.25
Negative	Invention	.59	.31	.63	.23	.41	.30	.47	.31	.70	.20
Positive	Lot	.43	.34	.55	.27	.33	.33	.17	.18	.74	.23
Neutral	Lot	.33	.31	.51	.21	.40	.32	.15	.23	.72	.22
Negative	Lot	.60	.30	.65	.25	.18	.30	.25	.22	.79	.21
Positive	Business	.70	.25	.70	.24	.18	.30	.39	.27	.73	.22
Neutral	Business	.75	.16	.71	.15	.27	.30	.55	.25	.72	.16
Negative	Business	.75	.17	.72	.17	.31	.33	.53	.28	.73	.17
All conditions		.56	.32	.62	.24	.30	.32	.34	.29	.72	.32

Equation 1 is appropriate if the utility one obtains from the other person's payoff does not depend on the payoff to oneself.

An alternative formulation includes the difference between the payment to the other party and one's own payment rather than the absolute payment to the other party. Defining DIFF as the difference between own and other's payoff,

$$U = c + B_1\text{SELF} + B_2\text{SELF}^2 + B_3\text{DIFF} + B_4\text{DIFF}^2. \quad (2)$$

Equation 2 is the bivariate utility function proposed by Conrath and Deci (1969). Note that by suitable manipulation, Equation 2 can be rewritten as Equation 1 plus an interaction term. Thus, we would expect Equation 2 to outperform Equation 1 if preferences for own payoff are not independent of the payoff to the other party.

A third form, suggested by equity theory, incorporates the absolute difference between self and other and the absolute difference squared. This formulation is applicable if people dislike disparity in either direction between own and other payoff. Let  $|\text{DIFF}|$  represent the absolute difference between own and other payoff. Then,

$$U = c + B_1\text{SELF} + B_2\text{SELF}^2 + B_3|\text{DIFF}| + B_4|\text{DIFF}|^2. \quad (3)$$

Finally, we tested a formulation based on the social motive that MacCrimmon and Messick (1976) defined as *proportionate competition*. This involves "choosing so as to increase the ratio of your payoff to the other's payoff" (MacCrimmon & Messick, 1976, p. 90). Defining PROP as payments to self divided by total payoffs,

$$U = c + B_1\text{SELF} + B_2\text{SELF}^2 + B_3\text{PROP}^+ + B_4\text{PROP}^-. \quad (4)$$

Because a higher proportion of payments may be desirable when payoffs are gains, but undesirable when payments are losses, we included separate PROP terms for losses and gains.

To compare the goodness of fit of the four specifications, we performed separate regressions for each subject, and within subjects, for each disputant relationship condition (positive, neutral, or negative) and dispute-type (personal or business) combination. Goodness of fit across the four equations was compared on the basis of adjusted  $R^2$ s. The Equation 1–4 col-

umns of Table 1 present the means of the adjusted  $R^2$ s for each of the four specifications in each of the relationship and dispute-type conditions.<sup>4</sup> Equations 1 and 2 provided systematically higher  $R^2$ s than did Equations 3 and 4, all  $t(725) > 141$ ,  $p < .0001$ , and Equation 2 also significantly outperformed Equation 1 in terms of  $R^2$ ,  $t(725) = 13.8$ ,  $p < .0002$ .<sup>5</sup> Looking across the nine relationship–dispute-type combinations in Table 1, it can be seen that Equation 2 is superior to Equation 1 in six combinations, equal in one, and inferior in two.

In a second round of estimation, we compared Equation 2 with a modified function that permitted a different slope and curvature for positive and negative values of DIFF. We also dropped the self-squared term because it failed to achieve significance in a majority of the regression equations.

$$U = c + B_1\text{SELF} + B_2\text{NEGDIFF} + B_3\text{NEGDIFF}^2 + B_4\text{POSDIFF} + B_5\text{POSDIFF}^2. \quad (5)$$

The prefixes NEG and POS act as binary switches that activate the terms for negative and positive values of DIFF respectively.

The mean adjusted  $R^2$  for Equation 5 under each relationship and dispute type is presented in the last column of Table 1.

<sup>4</sup> The interpretations of the differences between adjusted  $R^2$ s is questionable, due both to the problematic nature of the adjusted  $R^2$  statistic and to the fact that the different adjusted  $R^2$ s were estimated from the same population. Nevertheless, we believe the differences between the adjusted  $R^2$ s, and the significance of these differences looking across subjects, permits a reasonable qualitative comparison of goodness of fit across equations.

<sup>5</sup> We estimated all  $t$  statistics from an analysis of variance (ANOVA) in which the adjusted  $R^2$  of the regression equations served as the dependent variable and the equation type (1–5) served as the independent variable. All comparisons that were significant on the basis of the conventional  $t$  test were also significant at the .05 level, using Scheffé's test, which controls for experimentwise error. Each pairwise comparison is based on 888 regressions (148 subjects  $\times$  3 conditions  $\times$  2 equations); however, this number was reduced to 871 because of missing data. Correcting for the repeated measures nature of the design absorbed 145 degrees of freedom, leaving 725 degrees of freedom.

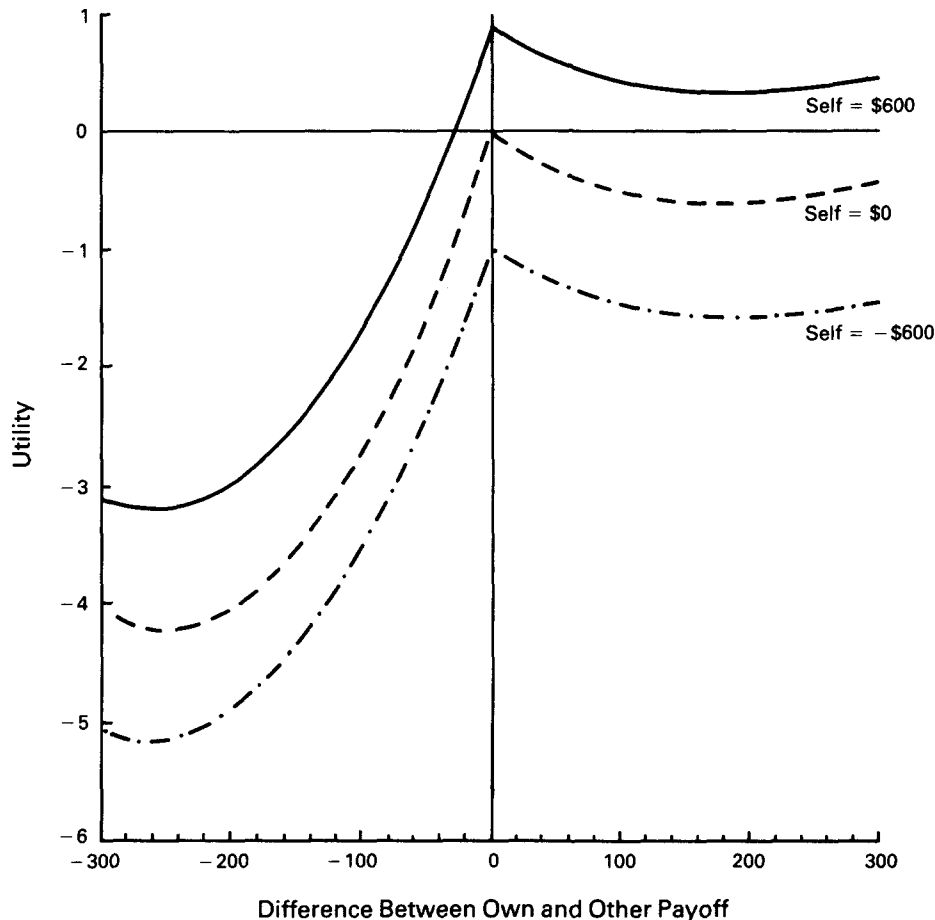


Figure 1. Utility as a function of difference between own and other payoff and payoff to self: Study 1.

Across the nine relationship-dispute-type conditions, the mean adjusted  $R^2$  for Equation 5 was .72, a significant improvement over the average adjusted  $R^2$  of .62 for Equation 2,  $t(725) = 58.6$ ,  $p < .0001$ . The fact that the inclusion of separate terms for positive and negative differences leads to such a great improvement in  $R^2$  suggests that in interpersonal, as in individual, decision making, there is a discontinuity in the treatment of positive and negative departures from one's reference level (Kahneman & Tversky, 1979; Walster et al., 1978).

The functional form represented by Equation 5 has several desirable qualities. First, it allows one to assess the relative importance of intrapersonal and interpersonal concerns by comparing the parameter values applied to SELF and to the various DIFF terms. Second, and as noted previously, it makes it possible to separate subjects' attitudes toward advantageous and disadvantageous inequality. Finally, the functional form is sufficiently flexible to permit comparison with individual-level models of decision making such as prospect theory.

The estimated utility function is illustrated in Figure 1, averaging across the three relationship conditions and three dispute types. Three different curves correspond to different levels of SELF (payoff to self). The predominant shape is upward sloping and convex for negative values of DIFF. For positive values of DIFF, the curve slopes downward and is also convex.

*Relationship and dispute type.* Table 2 summarizes the results of the regression analysis in tabular form, disaggregating the data by disputant relationship and dispute type. Each estimate is the mean of individual subjects' parameter estimates. To facilitate comparisons of parameter estimates across different relationship-dispute-type conditions, we performed separate analyses of variance (ANOVAs) with the regression parameters SELF, NEGDIFF, and POSDIFF serving as dependent variables and the relationship and dispute-type conditions as independent variables.

Concern for own payoff (as indicated by the parameter value for SELF) differed across the three types of disputes,  $F(2, 284) = 36.9$ ,  $p < .0001$ . Subjects displayed greatest concern for their own payoff in the invention and business disputes, whereas concern for own payoff in the lot scenario was significantly lower, all  $ts(284) > 40.7$ ,  $p < .0001$ .<sup>6</sup> The disputant relationship also had a significant effect on concern for self,  $F(2, 284) = 19.4$ ,  $p < .0001$ . Concern for own payment was highest in the negative relationship condition, followed by the neutral condition, and

<sup>6</sup> The between-conditions comparisons reported were based on conventional  $t$  tests. All pairwise comparisons reported in Studies 1 and 2 were also evaluated using the more conservative Scheffé multiple-comparison procedure; the results were qualitatively indistinguishable.

Table 2  
Mean Parameter Estimates by Relationship and Dispute Type: Study 1

Condition		Independent variables									
		SELF		NEGDIFF		NEGDIFF <sup>2</sup>		POSDIFF		POSDIFF <sup>2</sup>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Positive	Invention	.12	.16	3.5	2.8	.0065	.0065	-1.2	2.9	.0012	.0073
Neutral	Invention	.13	.20	3.3	2.2	.0059	.0052	-0.87	2.6	.0013	.0048
Negative	Invention	.30	.25	2.2	2.2	.0037	.0055	-0.28	2.5	-.0004	.0065
Positive	Lot	.043	.12	4.4	3.0	.0082	.0081	-2.1	3.2	.0048	.0072
Neutral	Lot	.068	.15	5.1	3.0	.0100	.0075	-2.5	2.6	.0053	.0055
Negative	Lot	.064	.16	4.3	2.9	.0087	.0070	-0.17	2.8	.0006	.0065
Positive	Business	.11	.23	2.3	1.8	.0037	.0046	0.41	1.6	-.0001	.0051
Neutral	Business	.26	.20	1.6	1.4	.0029	.0037	0.73	1.2	-.0004	.0037
Negative	Business	.29	.25	1.6	1.7	.0026	.0043	0.71	1.5	-.0003	.0035

Note. All parameter values and standard deviations multiplied by 100.

NEGDIFF = negative difference between own and other payoff, POSDIFF = positive difference between own and other payoff.

lowest in the positive relationship condition, with all three conditions significantly different from one another, all  $t_s(284) > 9.1$ ,  $p < .003$ . The interaction between relationship and dispute type was also significant,  $F(2, 284) = 3.18$ ,  $p < .02$ ; in the invention and business dispute settings, the value of SELF was substantially greater in the negative than in the positive relationship condition, but the effect was less pronounced in the lot condition.

Figure 2 compares the shape of the social utility function on the basis of mean parameter values for the positive, neutral, and negative relationship conditions.<sup>7</sup> The utility functions for all three conditions are positively sloped and convex for negative differences between own and other payoff (disadvantageous inequality); people do not like to do worse than the other party regardless of the relationship between the parties. However, the relationship between disputants did affect preference for disadvantageous inequality (NEGDIFF),  $F(2, 284) = 6.5$ ,  $p < .001$ , although the magnitude of the effect was small.

It is in the domain of positive differences between self and other (advantageous inequality) that the most striking differences between relationship conditions were observed. The effect of relationship on POSDIFF was significant,  $F(2, 284) = 11.6$ ,  $p < .0001$ . Averaging across the three dispute types, the slope of POSDIFF was positive under all relationship conditions, although it was much smaller in the negative relationship condition than in the positive and neutral conditions,  $t_s(284) > 16$ ,  $p < .0001$ .

In general, subjects were much more concerned with disadvantageous inequality than with advantageous inequality. The mean parameter estimate for POSDIFF given a positive or neutral relationship was approximately one-third the magnitude of that for NEGDIFF; subjects did not like to obtain a higher payoff than their opponent, but they much preferred a positive discrepancy between their own and the other party's payoff to a negative discrepancy of equal magnitude.

Figure 3 depicts the shape of the social utility function for each of the three dispute-type conditions. Again, the utility functions are all positively sloped and convex for negative differences between own and other payoff, although the slope of the utility function in the region of disadvantageous inequality

was affected by dispute type,  $F(2, 284) = 76.3$ ,  $p < .0001$ . Subjects were most concerned about falling below the other party in the lot dispute, were less concerned in the invention dispute, and were least concerned in the business condition, all  $t_s(284) > 26.8$ ,  $p < .0001$ . The effect of dispute type on utility for advantageous inequality is again more striking than that for disadvantageous inequality,  $F(2, 284) = 42.2$ ,  $p < .0001$ . Subjects were most resistant to receiving a higher payoff in the lot dispute, were next most resistant in the invention dispute, and actually preferred a higher payoff in the business dispute condition, with all  $t_s(284) > 11.4$ ,  $p < .001$ . The interactions between relationship and dispute type for both POSDIFF and NEGDIFF were not significant,  $F_s(4, 284) < 1.45$ ,  $p > .2$ .

*Individual differences.* One advantage to estimating a separate equation for each subject is that it permits classification of qualitatively different patterns of behavior. Table 3 shows the percentage of subjects in each of the relationship-dispute-type conditions who had positive parameter estimates for NEGDIFF and negative parameter estimates for POSDIFF, the modal response pattern. As noted earlier, a negative parameter value for NEGDIFF would mean that the subject preferred to obtain a lower payoff than his opponent. A positive value for POSDIFF would indicate that the subject receives satisfaction from obtaining a superior outcome than his opponent.

Looking down the Dislike disadvantageous inequality column, it is evident that very few subjects in any condition obtained positive satisfaction from receiving an inferior payoff. On the other hand, there is considerable diversity among subjects and across conditions in preferences for obtaining a higher payoff than the other player. For the invention and lot disputes, a majority of subjects in the positive and neutral relationship conditions (66%) disliked getting a higher payoff than the other player. On the other hand, in the negative relationship condition a majority (59%) preferred to come out ahead. In the business dispute, the relationship between disputants had little impact

<sup>7</sup> Figures 2, 3, and 5 are all based on a value of own outcome equal to 0.

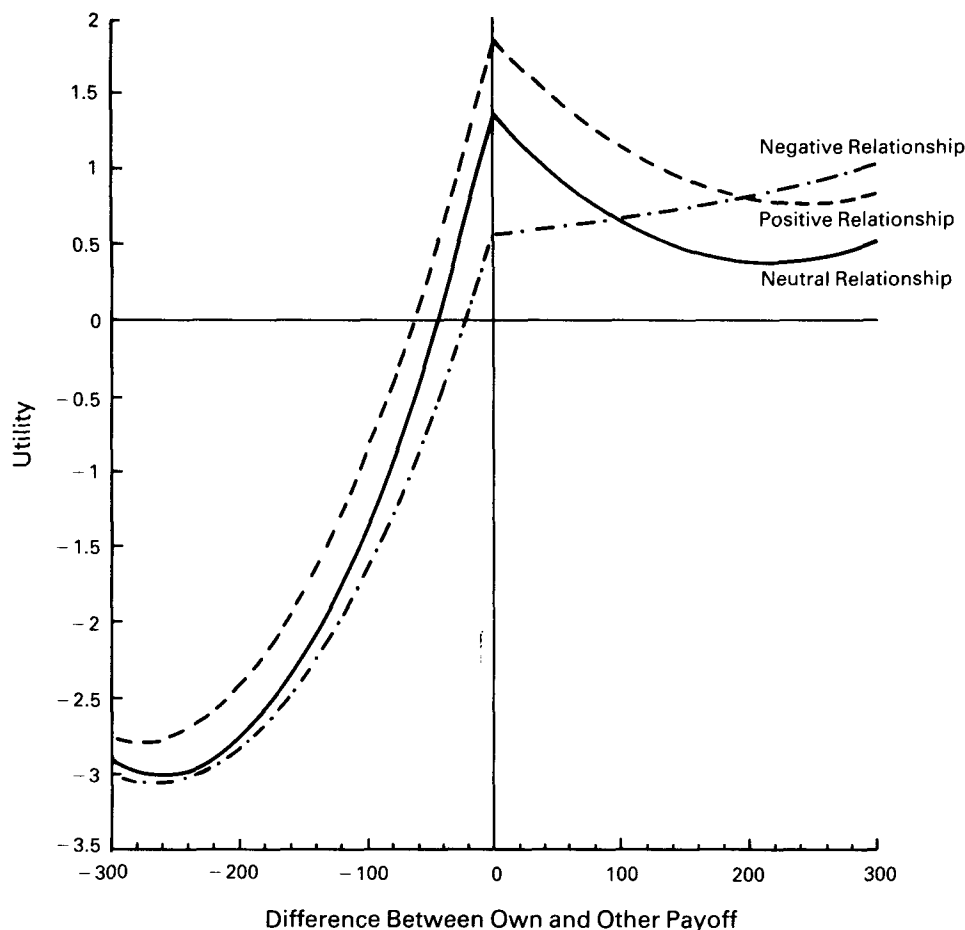


Figure 2. The effect of disputant relationship on the social utility function: Study 1.

on preferences; in all conditions, approximately 73% of subjects increased their level of satisfaction by increasing advantageous inequality.

### Discussion

In general, subjects were very concerned with the comparison of their own payoffs to those of the other party. This was true in all of the dispute settings and in each relationship condition. In fact, subjects were more concerned with the comparison of their own outcomes with those of the other party than they were with the value of their own outcomes. Most subjects preferred that rewards or costs be equitably shared, although they were more averse to disadvantageous inequality than to advantageous inequality. Similar results were obtained by Messick and Sentis (1985) in examining individuals' preferences for payoffs to the self and to the other party in an employment situation. Messick and Sentis found that when inputs were equal (students worked the same amount of hours), individuals preferred equal payments. When equality was not possible, however, subjects preferred that the other party be at a disadvantage relative to the self. We had expected the effect to be stronger when there was a negative relationship between disputants, but this was not ob-

served. Instead, the relationship between the disputants had a significant effect on concern with own payoff in two of the three negotiating settings. In both the lot and business disputes, we observed what could be called a "selfish shift"—a move toward greater concern for own payoff as the relationship shifted from positive to negative—that was mediated by dispute type.

The most significant impact of the two conditions was on subjects' preferences for advantageous inequality. In the two personal dispute settings (invention and lot), subjects generally preferred equal payoffs over advantageous inequality. However, in the business setting, subjects obtained positive utility from receiving a higher payoff. With a positive or neutral relationship between disputants, people disliked advantageous inequality. However, in a negative relationship, subjects became relatively unconcerned about the other party's payoff as long as it was less than or equal to their own payoff.

As the vast majority of subjects preferred higher payoffs to themselves ( $SELF > 0$ ) and disliked disadvantageous inequality ( $NEGDIFF < 0$ ), subjects' utility functions could be grouped into three qualitatively distinct patterns based on the sign of  $POSDIFF$ . One group we labeled *saints*; saints consistently prefer equality, and they do not like to receive higher payoffs than the other party ( $POSDIFF < 0$ ) even when they are in a negative rela-

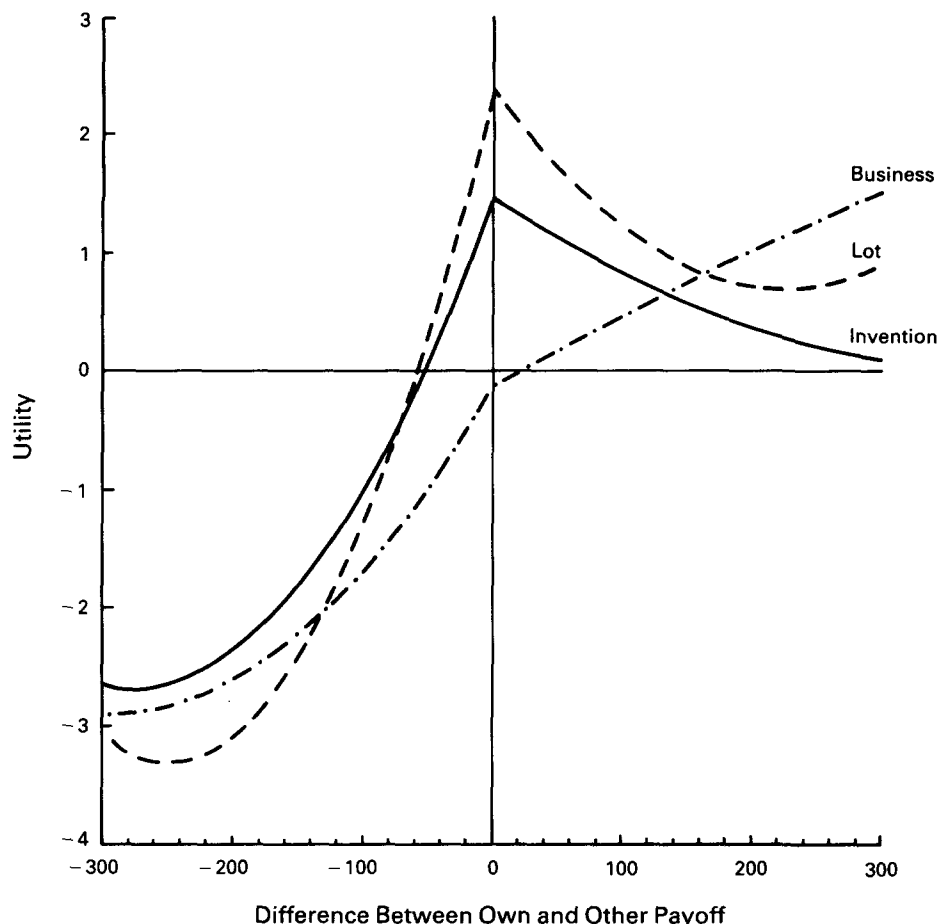


Figure 3. The effect of dispute type on the social utility function: Study 1.

relationship with the opponent. People in the second group, labeled *loyalists*, do not like to receive higher payoffs ( $\text{POSDIFF} < 0$ ) in positive or neutral relationships, but do seek advantageous inequality ( $\text{POSDIFF} > 0$ ) when they are involved in negative relationships. People in the third group, labeled *ruthless com-*

*petitors*, consistently prefer to come out ahead of the other party ( $\text{POSDIFF} > 0$ ) regardless of the type of relationship. In our sample, the proportions of saints, loyalists, and ruthless competitors were 24%, 27%, and 36%, respectively. The remaining 18% of subjects could not be neatly classified into any of the three categories. We suspect that the proportions of loyalists and ruthless competitors were elevated by the inclusion of the business condition, in which most subjects derived positive satisfaction from advantageous inequality, regardless of the nature of the relationship.

Table 3  
Proportions of Subjects Who Disliked Advantageous and Disadvantageous Inequality: Study 1

Condition		Dislike disadvantageous inequality (%)	Dislike advantageous inequality (%)
Relationship	Dispute type		
Positive	Invention	92	61
Neutral	Invention	92	55
Negative	Invention	94	42
Positive	Lot	98	68
Neutral	Lot	100	80
Negative	Lot	98	40
Positive	Business	94	26
Neutral	Business	96	27
Negative	Business	91	27

## Study 2

Some of the results of the first study surprised us. We had expected that people would prefer to receive superior outcomes to the other except, perhaps, in the positive relationship condition. Instead, even in the negative relationship condition subjects were relatively indifferent to advantageous inequality. Given the unexpectedness of this result, and the notorious instability of regression coefficients, we wanted to replicate our results on a different data set. At the same time, we suspected that the general indifference toward advantageous inequality in the negative relationship condition might be due to the subtlety



of the relationship manipulation. Therefore, we wanted to estimate social utility functions under a strengthened negative relationship condition. Finally, we were interested in estimating the proportions of saints, loyalists, and ruthless competitors in a different sample. In the first study, our estimate of these groups was affected by the inclusion of the business dispute in which most subjects weakly preferred advantageous inequality but were mainly concerned with their own payoff, regardless of the relationship condition. We conducted the second study, which included a strengthened relationship manipulation and which dropped the business dispute-type condition, to accomplish these goals. The two personal (i.e., nonbusiness) disputes provided a more uniform backdrop against which to observe the effect of the relationship between disputants on preferences for outcomes.

### Method

Forty-four graduate students of management participated in the study. The materials and procedures were the same as those used in Study 1. Our design included two within-subjects variables, relationship between disputants and dispute type. Subjects responded to two dispute situations, the lot and invention scenarios from Study 1. Half the subjects received the lot scenario first; the other half completed the invention scenario first. The relationship manipulations were similar to those in the Study 1, but were more detailed and explicit. For example, in the lot scenario, the positive relationship manipulation read as follows:

The Smiths are your neighbors. You like the Smiths a lot, and other neighbors consider the Smiths to be very nice as well. The Smiths always help out others. The Smiths are more than happy to take care of pets, water plants, and collect mail. Last week, the Smiths baby-sat for your children on very short notice, loaned you some very expensive tools for a repair project, and offered their guest bedroom for one of your out-of-town guests. In short, the Smiths are kind, friendly, sincere, responsible, and dependable.

The negative relationship manipulation was as follows:

The Smiths are your neighbors. You have had many unpleasant personal experiences with the Smiths. Your other neighbors also consider the Smiths to be obnoxious. The Smiths complain about others' lawn and house maintenance, yet they do not do any work on their own home. The Smiths borrow tools, but they do not say *thank you* and often fail to return items. Last week, the Smiths threatened to call the police on a small party you were having, damaged your lawn furniture after borrowing it for a larger party, and failed to pick up after their dog had been in your yard. In short, the Smiths are selfish, irresponsible, argumentative, demanding, and insincere.

The relationship manipulations for the invention dispute are included in the appendix. Following each dispute description, participants indicated their satisfaction with the same 42 outcomes for each of the two scenarios that were evaluated in Study 1.

### Results

Equation 5 was estimated again for all subjects and all relationship-dispute-type conditions. A total of 44 subjects each completed two relationship-dispute-type combinations, so a

total of 88 regressions was run. The mean adjusted  $R^2$  for these regressions was .66.

Figure 4 depicts the functional form for the regression, aggregating across the two relationship conditions and negotiating settings. Again the curve displays a tentlike form, upward sloping and convex for negative differences between the subject and the other party, downward sloping and convex for positive differences. Also evident is the steeper slope for negative differences (relative losses hurt more than relative gains) and the substantially greater effect on satisfaction of relative payoffs than of absolute payments to self.

Table 4 summarizes the results of the regression analysis, disaggregating the data by relationship and dispute type. We performed separate ANOVAs with regression parameter estimates for the variables *SELF*, *NEGDIFF*, and *POSDIFF* serving as dependent variables and relationship and dispute type serving as independent variables.

Concern for own payoff differed between the two negotiating settings,  $F(1, 42) = 8.6, p < .005$ , and across the two relationship conditions,  $F(1, 42) = 12.3, p < .001$ , but these effects were qualified by a significant interaction,  $F(1, 84) = 8.9, p < .004$ .<sup>8</sup> In the invention scenario, subjects again displayed a selfish shift; they were almost three times as concerned with their own payoff in the negative relationship condition as they were in the positive relationship condition. However, no such effect was observed in the lot dispute type.

Figure 5 depicts the shape of the social utility functions based on mean parameter values given a positive and negative disputant relationship. Again, the relationship had little effect on the utility function in the domain of disadvantageous inequality,  $F(1, 42) = 1.7, p > .2$ . The slope of the function in this region was also not affected by the dispute type,  $F(1, 42) = 1.27, p > .25$ , and the interaction was nonsignificant,  $F(1, 84) = 0.3, p > .5$ . Subjects disliked obtaining a lower payment than the other party received, regardless of the dispute type.

The slope of the function in the region of advantageous inequality, however, was affected by the relationship,  $F(1, 42) = 26.6, p < .0001$ . Subjects, on average, disliked advantageous inequality in the positive relationship condition and actually exhibited a weak taste for advantageous inequality in the negative relationship condition. Echoing the results for the lot and invention conditions in Study 1, preferences for advantageous inequality were unrelated to dispute type,  $F(1, 42) = 0.04, p > .8$ , and the interaction effect was not significant,  $F(1, 84) = 0.36, p > .5$ .

We again examined individual differences in outcome preferences among subjects. Table 5 indicates the frequency of subjects in each of the relationship-dispute-type conditions who

<sup>8</sup> Because subjects were always run in diagonal within-subjects cells, it was impossible to simultaneously examine interactions and take account of the repeated measures nature of the design. Therefore, the reported interaction effects are based on a simple ANOVA that treats the same subject in different conditions as two independent observations. It seems unlikely to us that this had much of an impact on the results. When we examined the main effects, both taking and not taking account of the repeated measures nature of the design, the results from the two analyses were virtually indistinguishable.

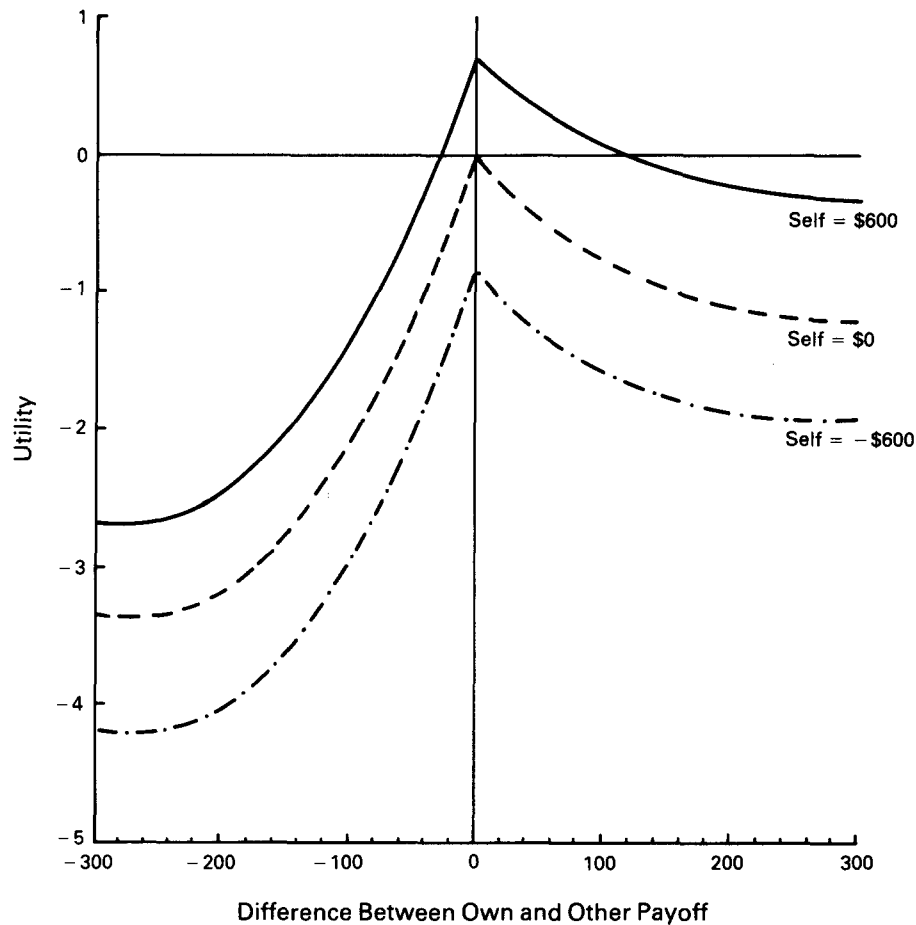


Figure 4. Utility as a function of difference between own and other payoff and payoff to self: Study 2.

had positive parameter estimates for NEGDIFF and negative estimates for POSDIFF.

Again, few subjects in any condition obtained positive satisfaction from obtaining an inferior payoff, whereas considerable diversity was evident between subjects concerning preferences for a superior payoff. Averaging across the two disputes, a majority of subjects (77%) in the positive relationship condition disliked getting a higher payoff than the other party. In the negative relationship

condition, a majority (68%) preferred obtaining a higher payoff. The proportions of saints, loyalists, and ruthless competitors were 20%, 52%, and 22%, respectively. The remaining 6% of subjects could not be classified into any of these three groups.

### Discussion

The purpose of Study 2 was to replicate the results of Study 1 and to explore the effects of relationships characterized by

Table 4

Mean Parameter Estimates by Disputant Relationship and Dispute Type: Study 2

Condition		Independent variables									
		SELF		NEGDIFF		NEGDIFF <sup>2</sup>		POSDIFF		POSDIFF <sup>2</sup>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Positive	Invention	.060	0.12	2.7	3.0	.0044	.0075	-2.0	3.1	.0034	.0072
Negative	Invention	0.31	0.32	1.8	1.6	.0034	.0040	0.44	1.3	-.0011	.0034
Positive	Lot	0.081	0.15	2.8	2.7	.0052	.0063	-1.7	2.6	.0034	.0060
Negative	Lot	0.081	0.12	2.6	2.5	.0052	.0060	0.067	1.9	.0004	.0038

Note. All parameter values and standard deviations multiplied by 100.

NEGDIFF = negative difference between own and other payoff, POSDIFF = positive difference between own and other payoff.

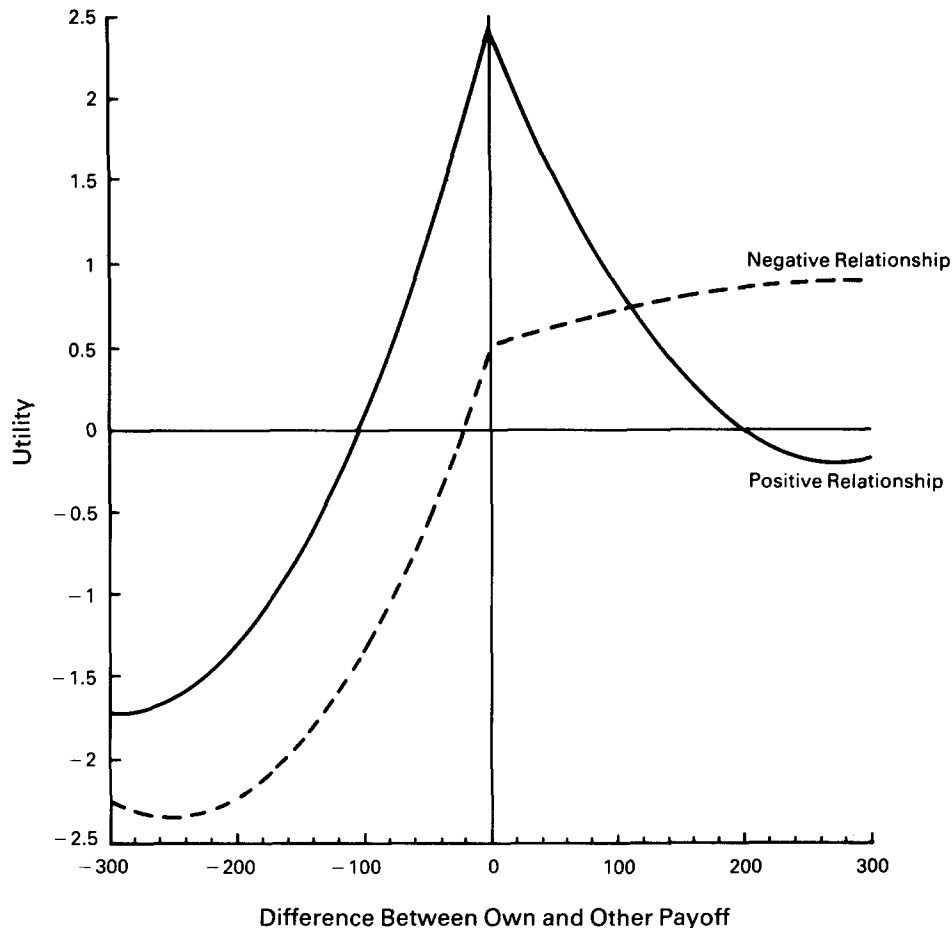


Figure 5. The effect of disputant relationship on the social utility function: Study 2.

strong negative and positive affect on interpersonal decision making. Overall, the results of Study 2 closely parallel those of Study 1. Although the strengthened relationship condition did cause subjects, on average, to seek out advantageous inequality in the negative relationship condition, the social utility functions estimated in Study 2 were similar to those derived in Study 1, and the impact of the manipulations was comparable. Again, relationship conditions (i.e., positive, negative) strongly influenced preferences for advantageous inequality, but did not

affect concern for disadvantageous inequality. Also, individuals showed a selfish shift (e.g., greater concern for own payoff) in the invention dispute as interpersonal relationships became more negative.

As in Study 1, most individuals could be classified into one of three groups, reflecting desires for advantageous equality in interpersonal contexts. There was a larger fraction of loyalists in the present study, which may reflect the more explicit relationship manipulations. Subjects were generally more favorably disposed to the opponent in the positive relationship condition and more hostile in the negative relationship condition.

Table 5  
*Proportions of Subjects Who Disliked Advantageous and Disadvantageous Inequality: Study 2*

Relationship	Dispute type	Dislike disadvantageous inequality (%)	Dislike advantageous inequality (%)
Positive	Invention	86	78
Negative	Invention	96	27
Positive	Lot	82	77
Negative	Lot	82	42

### Study 3

The striking correspondence between the results from Studies 1 and 2 increases our confidence in the reliability of the findings. However, the validity of the estimated social utility functions—whether they accurately predict choice behavior in dispute settings—is uncertain. To assess the predictive accuracy of the estimated social utility functions, we conducted a third study that compared choice behavior in individual and interpersonal decision tasks. Subjects in this study made three hypothetical choices in an individual choice setting and three choices—

Table 6  
*Payoffs to Self and Other: Study 3*

Choice	Individual choice condition			Interpersonal choice condition				
	Sure thing, payoff to self	Risky choice		Sure thing		Risky choice		
		Probability	Payoff to self	Payoff to self	Payoff to opponent	Probability	Payoff to self	Payoff to opponent
1	\$5,000	.3	\$4,000	\$5,000	\$5,000	.3	\$4,000	\$6,000
		.7	\$6,000			.7	\$6,000	\$4,000
2	\$4,000	.5	\$3,000	\$4,000	\$6,000	.5	\$3,000	\$7,000
		.5	\$5,000			.5	\$5,000	\$5,000
3	-\$5,000	.5	-\$10,000	-\$5,000	-\$5,000	.5	-\$10,000	\$0
			\$0			.5	\$0	-\$10,000

between arbitrating or accepting a certain offer—in an interpersonal setting. The two sets of choices were matched in terms of payoffs to self, but the interpersonal choice task introduced consequences for another decision maker. The three choices in the individual choice condition are summarized on the left-hand side of Table 6; the three interpersonal choices are summarized on the right-hand side. Disputant relationship (positive or negative) was manipulated between subjects.

The three choices were designed to test implications of the specific features of the social utility functions estimated in the first two studies. The first presented a choice between a sure \$5,000 and a risky alternative offering a .7 chance of \$6,000 and a .3 chance of \$4,000. In the interpersonal choice condition, the payoffs to self were identical, but the other party received the balance of \$10,000, that is, \$5,000 if the sure settlement was chosen and \$4,000 or \$6,000 under arbitration. On the basis of its relatively low level of risk and significantly higher expected value (\$5,400 vs. \$5,000), we expected subjects to prefer the risky option in the individual choice setting. In the interpersonal choice condition, however, we predicted that preferences would depend on the relationship between the disputants. In the positive relationship condition, most subjects dislike either form of inequality, making the arbitration option, which results in either advantageous or disadvantageous inequality, especially unattractive. In the negative relationship condition, people dislike disadvantageous inequality but are relatively indifferent to advantageous inequality. Hence, we expected a larger proportion of subjects in the negative relationship condition to opt for arbitration. Furthermore, we anticipated a greater preference for the sure thing in both interpersonal settings than in the individual decision setting, as aversion to either type of inequality tends to favor the \$5,000–\$5,000 split.

The second choice offered subjects in both settings (individual or interpersonal) a choice between a sure \$4,000 and a .5 chance at \$3,000 and at \$5,000. In the interpersonal setting, the other party received the balance of \$10,000. We expected subjects to prefer the sure thing in the individual choice condition, given the general tendency toward risk aversion for gains. However, we anticipated that subjects would opt for arbitration in the interpersonal condition. First, one of the outcomes involved a \$5,000–\$5,000 split, which is especially attractive, particularly given a positive relationship between disputants.

Second, the slope of the utility function in the region of disadvantageous inequality is convex, so the potential negative discrepancy of \$4,000 under the arbitration option is not twice as bad as the negative discrepancy of \$2,000 under the sure-thing option. We did not anticipate that preferences would be significantly affected by disputant relationship, which has little impact on preferences for disadvantageous inequality.

The third item involved losses rather than gains. In the individual choice condition, subjects were offered a choice between losing \$5,000 for sure or a .5 chance of losing \$10,000. On the basis of the tendency toward risk seeking in the domain of losses (Kahneman & Tversky, 1979), we expected subjects to prefer the risky outcome in the individual choice condition. However, in the interpersonal choice condition, because of the attractiveness of the equal-split option, we hypothesized that subjects would prefer the equal split of –\$5,000:–\$5,000 over equal chances of –\$10,000–\$0 and \$0–\$10,000. Furthermore, we predicted that subjects in the positive relationship condition would exhibit a greater preference for the equal split owing to their aversion to both types of inequality.

### Method

A total of 111 graduate students of management participated in the study. The experimenter explained that the purpose of the study was to examine decision making under different conditions. There were two phases, each conducted on different days separated by a 1-week interval. In Phase 1, half the participants completed individual choice questionnaires and half completed interpersonal choice questionnaires. In Phase 2, each group completed the questionnaire that they had not previously encountered. The individual choice questionnaire contained three hypothetical choices on a single page, with the instructions: "Below you are given choices between a SURE THING and a GAMBLE. Decide which option you prefer and indicate your choice to each question by circling either A or B." The interpersonal choice questionnaire was based on the lot condition from Studies 1 and 2. The questionnaire began with these instructions: "Below you are given a description of an incident involving you and a neighbor. Please read the description and then answer each question." It then introduced the lot scenario and the disputant relationship manipulation (positive or negative), which was adopted verbatim from Study 2 (see Appendix). The questionnaire described three situations in which the subject and neighbor either jointly owed or were to be paid \$10,000. Subjects were then given a choice between accepting

Table 7  
*Response Proportions: Individual Versus  
 Interpersonal Choice: Study 3*

Question	Individual choice ( <i>n</i> = 67)	Interpersonal choice	
		Positive relationship ( <i>n</i> = 35)	Negative relationship ( <i>n</i> = 32)
Question 1			
Sure thing	19%	85%	27%
Gamble-arbitrate	81%	15%	73%
	100%	100%	100%
Question 2			
Sure thing	73%	56%	33%
Gamble-arbitrate	27%	44%	67%
	100%	100%	100%
Question 3			
Sure thing	25%	85%	82%
Gamble-arbitrate	75%	15%	18%
	100%	100%	100%

a settlement proposed by the neighbor or taking the risky option of arbitrating.

### Results and Discussion

Table 7 summarizes the results from Study 3. In general, they conformed to predictions. On the first item, the disputant relationship had a significant impact on preferences. In the positive relationship condition, 15% opted for arbitration, whereas in the negative relationship condition 73% of subjects preferred the risky alternative,  $\chi^2(1, N = 67) = 32.7, p < .0001$ . Generally, in the interpersonal relationship condition subjects were likely to select the risky alternative. Averaging across the two relationship conditions, 38% of subjects chose the risky alternative in the interpersonal choice condition, and 81% did so in the individual choice condition—a significant difference, Cochran  $Q(1) = 27, p < .0001$ .

On the second item there was, as predicted, a greater tendency to select the sure thing in the individual choice than in the interpersonal choice condition. In the individual choice condition, a majority of subjects (73%) preferred the sure \$4,000 over the 50–50 chance at \$3,000 and \$5,000. In the interpersonal condition, 55% preferred the risky option of arbitration,  $Q(1) = 10.8, p < .001$ . However, contrary to our prediction, we observed a significant effect of disputant relationship on preference for arbitration. Subjects in the negative relationship condition were more likely to opt for arbitration (67%) than were subjects in the positive relationship condition (44%),  $\chi^2(1, N = 67) = 4.9, p < .05$ . The effect of disputant relationship may reflect a generally negative attitude toward arbitrating a dispute against a friend.

Finally, the results for the third item were largely as predicted. In the individual decision condition, a majority (75%) of subjects selected the risky option, whereas in the interpersonal choice condition 85% preferred the sure \$5,000–\$5,000 split,  $Q(1) = 38.1, p < .0001$ . The difference between the positive and

negative relationship conditions was not significant,  $\chi^2(1, N = 67) = 0.67, p > .15$ , although, as predicted, a higher proportion in the positive relationship condition opted for the equal split. It is possible that the nonsignificance of the relationship manipulation was due to ceiling effects; even in the negative relationship condition a full 82% chose the equal split.

### General Discussion

Our goal was to estimate social utility functions in a dispute context. We were especially interested in the effect of the relationship between disputants on preferences for own and other outcomes. The following conclusions summarize our main findings.

First, individuals' utilities for disputed outcomes depended on the magnitude of their own outcomes and on the difference between their own and the other party's outcomes. This finding is consistent with earlier research (e.g., Messick & Sentis, 1985), indicating that individuals' concern with own and others' payoffs is well captured by an additive function of nonsocial utility (own payment) and social utility (difference between own and other's payment). Second, most disputants preferred equal payoffs over either advantageous or disadvantageous inequality. The modal utility function was tent-shaped: increasing and convex for disadvantageous inequality, decreasing and convex for advantageous inequality. Third, if inequality was unavoidable, people preferred advantageous over disadvantageous inequality. Fourth, the disputant relationship and negotiation context exerted their main impact on concern with own payoff and attitude toward advantageous inequality, but had little impact on attitudes toward disadvantageous inequality. Fifth, as the disputant relationship shifted from positive to negative, subjects displayed a selfish shift: They became more concerned with their own payoff, independent of the other party's, and more tolerant of advantageous inequality. Sixth, we found that subjects could be neatly categorized according to their preferences toward advantageous inequality. We labeled as saints those subjects who preferred equality over inequality, regardless of the relationship between disputants. Loyalists preferred equality when involved in a positive relationship, but preferred advantageous inequality under conditions of a negative relationship. Ruthless competitors sought advantageous inequality under all conditions, even in the positive relationship condition. Averaged across the first two studies, the proportions of saints, loyalists, and ruthless competitors in our samples were, respectively, 22%, 39%, and 29%.

In general, interpersonal concerns overshadowed concern for own outcome independent of the other's outcome, thus providing further evidence for the importance of relative comparisons in decision making, a prominence that has already been recognized in research on decision making under uncertainty (see, e.g., Bell, 1982; Fishburn, 1977; Loomes & Sugden, 1982). Most prominent among theories of decision making under uncertainty that incorporate relative concerns is prospect theory (Kahneman & Tversky, 1979). Prospect theory examines decision making in individual contexts in which decision outcomes affect only the decision maker; the reference point is most frequently modeled as the current state of the decision maker, although it can also assume other psychologically relevant values.

One such value, particularly relevant in interpersonal negotiations, is the payoff to another party. If this payoff is adopted as a reference point, then the  $x$ -axis will correspond to the difference between the two parties' payoffs as in the social utility functions illustrated in Figures 1–5.

Although further underscoring the importance of relative comparisons, the current findings challenge the generalizability of prospect theory's specific qualitative features to an interpersonal setting. The predominant shape of the social utility function we estimated resembles the prospect theory value function in the domain of losses; it is upward sloping and convex. However, for positive differences in payoffs, the curve slopes downward and is also convex. Prospect theory's value function is upward sloped and concave for gains. We found that prospect theory makes accurate predictions of decision behavior in the individual decision contexts we examined, but that decision making departs systematically from these predictions in an interpersonal context—in ways predicted by a tent-shaped social utility function.

An important question concerns the generalizability of the present results to decision making in real-world disputes. Although having subjects rate their satisfaction with, or choose between, hypothetical outcomes is a common practice in psychological research, the problem of generalizability may be especially significant in interpersonal contexts for several reasons. First, emotions are likely to play a more important role in interpersonal decision making than in other situations, and hypothetical questions are unlikely to evoke the same intensity of emotions as real-world situations. We cannot predict whether or how the emotions that often arise during negotiations would influence social utility functions. Our analysis, however, provides a framework within which to examine such effects. Would concern for own payoff be greater or smaller in a real dispute than in our study? Would the slope of the utility function in the domain of advantageous inequality slope more steeply downward? These questions could be addressed by interrupting an actual dispute, asking disputants to confidentially rate their satisfaction with different outcomes, and using these ratings to estimate individual-level social utility functions. We suspect that emotions would intensify the effects we observed, but not change them qualitatively. Answers to these questions await further research.

A second concern in this, and in most experimental and observational research, is that subjects' responses may be influenced by considerations of social desirability. Norms of behavior for social situations are better established than are those applying to, for example, decision making under uncertainty. However, it is difficult to assess, *a priori*, the direction of the bias that social desirability considerations introduce. Behavior in real-world settings is also influenced by norms of behavior, and it is unclear whether norms exert a greater impact in real or experimental settings.

A final concern is that the outcomes in our studies were presented to the subjects without any account of how they were arrived at. In real negotiations, any settlement has a history that may influence participants' satisfaction. For example, disputants are generally more satisfied with outcomes when they feel personally responsible in the sense of having obtained concessions from the other party. Earlier research has examined the

effects of concession rates and other variables relating to settlement history on negotiator attitudes and behavior (e.g., Pruitt & Drews, 1969). We chose to abstract away from historical variables and to focus instead on the effect of the relationship between negotiators and the nature of the dispute on social utility. Again, our estimation methodology would provide an excellent structure for assessing the impact of settlement history on negotiator preferences.

The social utility functions we estimated paint a rather benevolent picture of disputant preferences in a wide range of situations. Most of our subjects either disliked or exhibited only a weak preference for advantageous inequality. Even for ruthless competitors, parameter estimates for advantageous inequality were, if positive, close to zero. In contrast, the negotiation literature (e.g., Raiffa, 1982; Seigel & Fouraker, 1960) highlights the fact that negotiators often fail to reach agreements because of invidious social comparisons. What factors might explain why individuals in our experiments focused on clearly equitable agreements, but individuals in real-world contexts have difficulty reaching mutually acceptable decisions and often appear to be trying to beat the other party?

One possible explanation stems from the great complexity of most interpersonal decision tasks. Most disputes involve a number of issues and often call into play competing norms of distributive justice. Furthermore, disputants are often ignorant of the other party's interests. Complexity and imperfect information permit subjective interpretations of equity. Faced with ambiguous information, egocentric biases (Ross & Sicoly, 1979) may pervade individuals' judgments regarding the fairness of different potential settlements (see, e.g., Raiffa, 1982, p. 75, p. 94). When faced with the task of dividing scarce resources, disputants may invoke norms and reasoning that favor the self, causing both parties to simultaneously perceive themselves as being in the domain of disadvantageous inequality. In this region, most subjects can enhance their utility by decreasing the payoff to the other party, even at the expense of some decrement to their own payoff. Each party is likely to see its own attempts to decrease the other party's relative payoff as an attempt to restore equity, whereas the other party's efforts are seen as efforts to gain an unfair advantage. The likely outcome of these combined efforts to restore equity will be a destructive downward spiral of recriminations and joint losses.

The preceding discussion suggests that one interesting direction for future research would be to examine interpersonal decision making under different levels of complexity and uncertainty regarding the parties' inputs and interests and in situations in which multiple norms of distributive justice are operative. In our study, the neutral dispute situation was relatively unambiguous, and individuals probably focused on a single criterion of equity: equal payoffs or payments by both parties. Thus, we were unable to observe self-serving interpretations of equity and their effect on social utility and decision making. It would be informative to explore whether breakdowns in negotiations are typically due to individual factors, such as the presence of ruthless competitors on one or more sides, or to environmental factors, such as complexity and imperfect information, that permit egocentric interpretations of equity.

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## Appendix

## Stimuli: Experiment 1, Lot Scenario

You live adjacent to an empty lot separating you from your next-door neighbor to your left. No one knows who owns the lot, despite the fact that you and your next-door neighbor have lived there for more than 2 years. However, the city recently informed you that the lot actually belongs to both you and your neighbor, but the percentage owned by each of you has to be negotiated.

*Positive Relationship*

You have always been fond of your neighbors: They take care of your pets when you are out of town, and they always invite you to their parties.

*Negative Relationship*

You have never been fond of your neighbors: they let their dogs roam in your yard and you frequently have to pick up after the dogs. Adding insult to injury, last New Year's Eve they called the police a few minutes after midnight to disrupt your party.

*Loss*

The lot is too small to sell. However, the city has assessed taxes on the property that you and your neighbor must pay. You and your neighbor need to decide how to split the costs of the taxes.

*Gain*

A third neighbor who lacks a backyard has agreed to buy the property for gardening purposes. You and your neighbor would both be happy to have a garden between your houses. You and your neighbor need to decide how to split the profit.

## Stimuli: Experiment 1, Business Scenario

You bought a new computer system for word processing. Having a computer system has been a major advantage in your life. With each new year of college, you have found that the amount of writing required has increased. You do not know how you would get the work done without the computer.

*Positive Relationship*

During your visit to the computer store, the salesperson gave you excellent information and personal attention. When it appeared that delivery of your computer would be delayed, he personally drove to the warehouse to get the computer in time for your final exams.

*Negative Relationship*

During your visit to the computer store, the salesperson treated you in a rude manner. Moreover, he tried to sell you an inferior brand. Clearly, he was trying to take advantage of your lack of knowledge.

*Loss*

Your computer had a warranty of only 30 days. On the 29th day, a Saturday, the computer broke down. You called the store, but they could not be reached until Monday—2 days after the warranty ended. The manufacturer would not give the extension. The dealer arranged for the computer to be repaired. However, the bill has to be divided between you and the dealer. You and the dealer need to decide how to split the cost.

*Gain*

After buying the computer, you and the dealer found out that the manufacturer was offering a rebate. The rebate was a negotiated rebate, meaning that it can be divided between the dealer and customer as the two parties choose. You and the dealer must decide how to split the rebate.

Study 2: Strengthened Relationship Manipulations  
(Invention Dispute Type)*Negative Relationship*

Pat is a student who lives in your dorm. You have had many unpleasant personal experiences with Pat, and other people in the dorm also consider Pat to be obnoxious. Pat complains about others' living habits, yet does not do any work. Pat borrows notes and copies assignments, but does not say *thank you* and often fails to return items. Last week, Pat failed to pick up some party supplies after promising to do so, did not show up for an important intramurals playoff game, and insulted one of your friends. In short, Pat is selfish, irresponsible, argumentative, demanding, and insincere.

*Positive Relationship*

Pat is a student in your dorm. You like Pat a lot, and other people in the dorm also consider Pat to be very nice. Pat always helps out when others need help in everyday dorm activities. Pat takes notes and picks up assignments for people who miss classes. Last week, Pat made all the arrangements for a small dorm party, gathered everyone together to visit a sick friend in the health center, and offered his room to you for your out-of-town guest. In short, Pat is kind, friendly, sincere, responsible, and dependable.

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