

Observing Social Value Orientations: A Social Interdependence Approach

Michael J. Platow

Department of Psychology, University of Otago

Social Value Theory, in which individuals are assumed to be concerned with both own and other(s)' outcomes in socially independent situations, is reviewed. Individuals' social value orientations are then measured in a sample of 785 New Zealand university students. Eighty-five percent of the subjects adopted a cooperative, an individualistic, or a competitive social value orientation. These data are compared with the relative frequencies obtained in the United States and the Netherlands. Differential response latencies to various self-other choice alternatives were also observed for individuals adopting different social value orientations.

Casual and formal observations of social behaviour suggest considerable variability in individuals' relative concerns for their own outcomes in social situations (e.g., love, status, money) and the outcomes of others(s) with whom they are interdependent (see e.g., Campbell, 1965; Caporeal, Dawes, Orbell, & van de Kragt, 1989; Griesinger & Livingston, 1973; Lynn & Oldenquist, 1986; MacCrimmon & Messick, 1976). One theory outlining such concerns (or subjective weightings) that has received considerable theoretical and empirical attention is *Social Value Theory* (Kelley & Thibaut, 1978; Kuhlman & Marshello, 1975; Liebrand & van Run, 1985; McClintock, 1972). In contrast to more traditional economic and game theoretic views human decision making (Hamburger, 1979; Rapoport, 1960), the fundamental premise of Social Value Theory is that all individuals are not indifferent to the outcomes of other(s). Instead, subjective utility accruing to individuals from any particular social outcome distribution is considered to be a weighted function of their own and other(s)' outcomes.

In the current paper, a review of Social Value Theory is presented, followed by the results of the first study examining the relative frequency of individuals adopting various self-other outcome weightings in a sample of New Zealand undergraduate students. As a methodological replication and empirical extension of prior research

(Dehue, McClintock, & Liebrand, 1993; Liebrand & McClintock, 1988;), the adoption of these weightings is then demonstrated to be associated with differential configurations of response latencies to various self-other alternatives.

Social Value Theory

Social Value Theory specifically assumes that antecedent objective outcomes within social situations are psychologically transformed (Grzelak, 1981; Knight, Dubro, & Chao, 1985) through the application of individuals' stable (see Kuhlman, Camac, & Cunha, 1986) self-other outcome weighting preferences (i.e., their *social value orientations*). It is upon resultant "subjective representations" (Grzelak, 1981, p. 125) that actual decisions are assumed to be made (McClintock & Liebrand, 1988).

Figure 1 presents a geometrical illustration of subjective weighting patterns that individuals can adopt in social situations (Griesinger & Livingston, 1973; MacCrimmon & Messick, 1976). As can be seen, the different weightings of self-other outcomes are represented as vectors of ordered pairs within a Cartesian coordinate plane. Values along the abscissa represent weights assigned to own outcomes, and values along the ordinate represent weights assigned to other's outcomes. Preference for a particular set of weights (i.e., a vector of ordered pairs) within the plane is assumed to reflect an individual's social value orientation.

Three social value orientations, or weighting patterns, have received the most theoretical and empirical attention (Bem & Lord, 1979; Liebrand & McClintock, 1988; Messick & McClintock, 1968; van Lange & Liebrand, 1991). The first of these is the orientation to maximize the sum or

The author would like to thank Roger Shave for his critical comments on an earlier draft of this paper, the many laboratory demonstrators who assisted in data collection, and Louise Ford for her assistance in data collation. Requests for reprints should be sent to Dr M. J. Platow, Dept. of Psychology, University of Otago, Box 56, Dunedin.

joint outcomes to both self and other(s). This *cooperative social value* represents a positive weighting of both own and other(s) outcomes, and is depicted in Figure 1 as a vector extending from the origin at a 45 degree angle. The second social value most frequently observed is the ori-

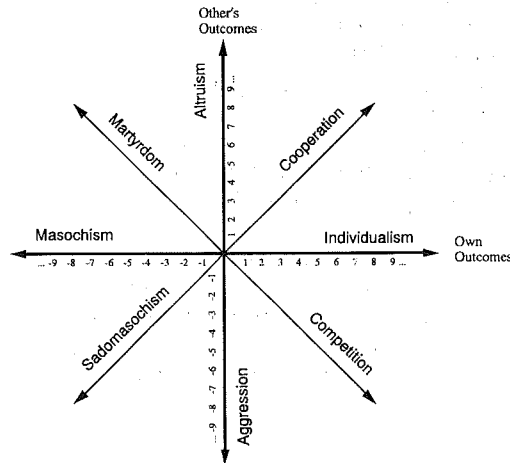


Figure 1. Two-dimensional self-other outcome space. Values on the abscissa represents weights placed on own outcomes, and values on the ordinate represent weights placed on other's outcomes.

entation to obtain the greatest amount of resources for self, independent of the outcomes to other(s) (i.e., strict own gain). This *individualistic social value* represents a positive weighting of own outcomes and a zero weighting of other(s) outcomes, and is depicted in Figure 1 as a vector extending from the origin at a zero degree angle. Finally, the third most frequently observed social value is the orientation to obtain relatively more resources for self than other(s). This *competitive social value* is expressed in a zero sum weighting of own and other(s) outcomes, with own outcomes weighted positively. This orientation is depicted in Figure 1 as a vector extending from the origin at a 315 degree angle.

In addition to these three orientations, the framework outlined in Figure 1 allows for the observation and measurement of several additional linear orientations such as altruism, martyrdom, and aggression, as well as non-linear orientations such as equity (Griesinger & Livingston, 1973; MacCrimmon & Messick, 1976).

Behavioural and Cognitive Correlates. Upon measurement via actual choice behaviour (details in Method section), individuals' social value

orientations have served as successful predictors of behaviour in both laboratory and non-laboratory situations. For example, high levels of non-cooperation in a Prisoner's Dilemma game (see Colman, 1982 for a description) by competitors occurs independent of other's (cooperative, tit-for-tat, or competitive) behaviour. Contrasted with this, however, are higher levels of cooperation by individualists and even higher by cooperators when other adopts a cooperative or tit-for-tat strategy. Non-cooperation against a competitive other is relatively high for all social value groups (Kuhlman & Marshall, 1975; McClintock & Liebrand, 1988). Further, research in an intergroup setting (in which subjects allocate points to one unknown ingroup member and one unknown outgroup member) has demonstrated that cooperators allocate the most fairly (i.e. minimize the difference) and competitors the most unfairly (i.e. relative ingroup gain), with individualists falling between these two extremes (Platow, McClintock, & Liebrand, 1990).

These choice behaviour differences have been paralleled by observed social value differences on non-decision making measures. For example, friends and acquaintances implicitly recognize subjects' social values by either providing theoretically meaningful behavioural and personality descriptions (Bem & Lord, 1979) or by predicting their resource allocation preference (Knight, 1981). Further, McClintock and Allison (1989) observed that cooperatively oriented individuals make larger contributions of volunteered time than individualistically or competitively oriented ones when solicited by mail.

Finally, systematic differences have been observed as a function of individuals' social value orientations in the processing of social information. Specifically, Liebrand and McClintock (1988), and Dehue, et al. (1993) measured subjects' response latencies to several different self-other choice alternatives. This paradigm derives from the outcome transformation assumption, hypothesizing that response latencies should vary with the different algebraic computations (i.e., applications of different weights) assumed to be made in the subjective transformation of social outcomes. For example, computations in which one outcome (own or other's) is weighted with zero are expected to take *less* time than computations in which both outcomes are weighted with non-zero values. This reasoning led to the prediction that individualists and altruists would exhibit shorter response latencies than either competitors

or cooperators. Results were consistent with this prediction.

In addition to this main effect, Liebrand and McClintock (1988), and Dehue, et al. (1993) observed an interaction in response latencies between individuals' social value orientations and the valence (i.e., gains or losses) of the outcomes to self and other. These authors observed that the interaction occurred primarily from the cross-over in latencies between competitors and cooperators under conditions were (1) both self and other lose, and (2) self loses while other gains. For competitors, an increase in response latencies obtains from the first condition to the second. This pattern is reversed for cooperators. Liebrand and McClintock offered a motivational explanation by hypothesizing that cooperators are particularly adverse to situations in which joint loss is inevitable ("pro-social hypothesis"), and competitors are particularly averse to situations in which other gains while self loses ("anti-social hypothesis").

Currently, social value orientations of a sample of New Zealand undergraduates are measured and used as predictors of their response latencies to several self-other choice alternatives.

Method

Subjects

Seven-hundred, eighty-nine undergraduate students (predominantly Pakeha) enrolled in an introductory psychology course at the University of Otago participated as subjects during their normal laboratory session. Data from four subjects were not included in the analyses. Of these four, the gender of two was not identifiable. The other two (one male & one female) completed the task twice. This left a final sample of 307 males and 478 females.

Materials and Procedure

A computerized version of Liebrand's (1984) Ring Measure of Social Values¹ was currently used to measure both individuals' social value orientations and their response latencies to self-other choice alternatives. Twenty-four, two-option self-other choice alternatives, such as the one displayed in Figure 2 served as stimuli. The choice alternatives were sampled at equal intervals from the circumference of a circle on a self-other outcome plane (e.g. Figure 1) with its center at the origin and a radius of 15. The values for each ordered pair were presented to subjects as dollars for self and other.

Six points were sampled from each of the four quadrants in the plane, making up 24 pairs of outcomes. Points sampled from Quadrant I represented

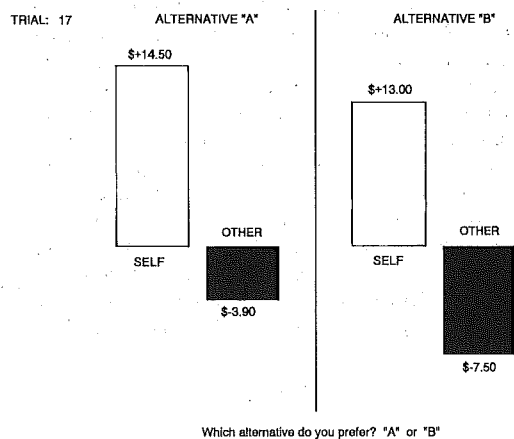


Figure 2. Example of one of the twenty-four, two-option self-other choice alternatives that served as stimuli.

positive outcomes for both self and other (s+o+). Points sampled from Quadrant II represented negative outcomes for self, and positive outcomes for other (s-o+). Points sampled from Quadrant III represented negative outcomes for both self and other (s-o-). And points sampled from Quadrant IV represented positive outcomes for self and negative outcomes for other (s+o-).

Each point, or pair of self-other outcomes, was coupled with a neighbouring point, yielding two different self-other outcome alternatives. The 24 two-option self-other choice alternatives were then presented to subjects who were asked to choose the option they most preferred. Upon completion of all 24 trials, total outcomes allocated to self and other were independently calculated, yielding a new point in the 2-dimensional outcome space. The angle at which the vector extending from the origin intersected this point was then calculated and used as the measure of each subject's social value orientation. Subjects who were 100% consistent in their choices would produce a point with a vector length that was two times the radius of the circle.

For example, subjects adopting a pure cooperative social value orientation will select the values sampled from the point on the circle at a 45 degree angle twice (i.e., this point is preferred over each neighbour). With transitive preference structures, the sum of outcomes from all other points will equal zero. Thus the final accrued outcomes will be twice the most preferred point. More detailed descriptions of the structure, use, and validation of the Ring Measure of Social Values are presented in Dehue, et al. (1993), Liebrand (1984), Liebrand and McClintock (1988), Liebrand, Wilke, Vogel, and Wolters (1986), and McClintock and Liebrand (1988).

Instructions presented on the computer informed

subjects that they were participating in a "decision making task for two people: YOURSELF and ONE OTHER person". Each subject was then informed that he or she and the "other person" would be making decisions under conditions in which their choices mutually affected each other's outcomes, although the "other person" would remain unknown to them. No "other person" really existed; these instructions served as a manipulation of perceived independence. The outcomes (i.e., dollars) were "imaginary". After several examples, the 24 pairs of self-other outcomes were presented to each subject in a unique random order. Subjects' latencies to indicate each preference were measured by the computer to the nearest 100th of a second.

Results

Identification of Social Values

Consistent with previous research employing the Ring Measure of Social Values (e.g. Liebrand & McClintock, 1988; McClintock & Liebrand, 1988), the following criteria were employed to identify subjects' dominant social value orientations. The two-dimensional self-other outcome plane depicted in Figure 1 was partitioned into eight mutually exclusive 45 degree sectors, each corresponding to one social value orientation. For example, subjects whose preference vectors were within the 45 degree arc of 22.5 degrees and 67.5 degrees were identified as having a cooperative social value orientation. Subjects whose preference vectors fell within the 45 degree arc of 22.5 degrees clockwise to 337.5 degrees were identified as having an individualistic social value orientation. And subjects whose preference vectors were within the 45 degree arc of 292.5 degrees and 337.5 degrees were identified as having a competitive social value orientation. The other five orientations outlined in Figure 1 were calculated in a similar manner.

In addition to the linear orientations depicted in Figure 1, subjects may also adopt a *minimize the*

difference (e.g., equality) orientation. On the Ring Measure, total outcomes to self and other for subjects adopting such an orientation on each of the 24 trials would be zero, yielding no vector angle. For the current research, individuals were identified as adopting this orientation if: (1) their consistency for any particular linear orientation was less than 1/3, and (2) at least 75% of their individual choices (i.e., 18 choices) followed a minimize the difference rule.

Subjects were not identified as having a dominant social value orientation if: (1) their preference vectors fell within 0.05 degrees of the boundary between two orientations, or (2) their choices were less than 25% consistent with a linear orientation (see McClintock & Liebrand, 1988) and were not identified as adopting a minimize the different orientation.

Variability in Social Value Orientations

Table 1 displays the number and percentage of individuals falling within each gender by social value orientation category (including "boundary" and "inconsistent" subjects). Consistent with previous research (Liebrand & van Run, 1985; McClintock & Liebrand, 1988), the majority of subjects (85%) adopted either a cooperative, an individualistic, or a competitive orientation. However, unlike previous research, we were able to identify at least two individuals adopting each of the other five linear orientations, plus five subjects adopting a minimize the difference orientation. As such, we were able to successfully identify the social value orientation of nearly 90% of the subjects in our sample. Of course, the subjects in the "boundary" category (3.70%) would be included in any analysis in which social value orientations were treated as continuous rather than categorical variables (e.g., Brann, 1987).

Across all categories, a slightly higher percent-

Table 1: Frequency and Percentage of Males and Females Adopting Each Social Value Orientation

Gender	Social Value Orientation										
	Altruist	Cooperator	Individualist	Competitor	Aggressor	Sadomasochist	Masochist	Martyr	Min.Diff.	Border	Inconsistent
Male	2(0.65)	66(21.50)	137(44.63)	66(21.50)	5(1.63)	2(0.65)	1(0.33)	1(0.33)	1(0.33)	8(2.61)	18(5.86)
Female	6(1.26)	124(25.94)	213(44.56)	62(12.97)	7(1.46)	1(0.21)	1(0.21)	1(0.21)	4(0.84)	20(4.18)	39(8.16)

Note: Numbers in parentheses are percentages within each gender category.

Table 2: Mean Log Response Latencies for Six Social Value Groups as a Function of the Self-Other Outcome Valence

Outcome Valence	Social Value Orientation					
	Altruist	Cooperator	Individualist	Competitor	Aggressor	Min.Diff.
s+o+	1.933	1.941	1.860	1.914	1.223	1.983
s+o-	1.904	2.016	1.865	2.032	1.271	2.035
s-o-	1.944	2.049	1.921	2.041	1.396	2.018
s-o+	2.109	2.053	1.994	2.243	1.489	2.261

Note: s = self, o = other; + = positive outcomes, - = negative outcomes

age of females adopted altruistic (1.26%) and minimize the difference (0.84%) orientations than males (0.65% & 0.33% respectively), whereas the percentage of males and females adopting aggressive orientations was about equal (1.63% & 1.46% respectively).

To observe formally gender differences in the frequency of adopting particular social value orientations, a gender by social value chi-square analysis was conducted. Only cooperators, individualists and competitors were included in this analysis because of the small frequencies in the other gender by social value categories. A significant relationship was observed, $\chi^2(2, N=668) = 9.89, p < .01$. Across these three social value categories, a higher percentage of males were competitors (24.54%) than females (15.54%). In contrast, a higher percentage of females were cooperators (31.08%) than males (24.54%). The percentage of males adopting an individualistic orientation (50.93%) was nearly the same as the percentage of females adopting this orientation (53.38%).

Response Latencies

A 4 (quadrant/outcome valence) x 6 (social value orientation) analysis of variance (ANOVA)² was conducted on the mean, log transformed response latencies (cf. Fazio, 1990) of each quadrant. Social value categories were included in this analysis only if they contained at least five subjects³. This criterion left six categories: altruistic (n=8), cooperative (n=190), individualistic (n=350), competitive (n=128), aggressive (n=12) and minimize the difference (n=5). Means are presented in Table 2.

A significant main effect for individuals' social value orientations was observed, $F(5, 687) = 7.00, p < .001$. Overall (log) response latencies were shorter for individuals adopting orientations in

which either own or other's outcomes were weighted with zero than for individuals adopting orientations in which both own and other's outcomes had non-zero weights. Specifically, aggressors had the shortest latencies ($M=1.35$), followed by individualists ($M=1.91$) and altruists ($M=1.97$). In contrast, individuals adopting minimize the difference orientation had the longest latencies ($M=2.07$), followed by competitors ($M=2.06$) and cooperators ($M=2.01$).

A significant main effect for quadrant/outcome valence was also observed, $F(3, 2061) = 14.02, p < .001$. Consistent with previous results (Dehue, et al., 1993; Liebrand & McClintock, 1988), this effect is attributable to the linear increase from Quadrant I (s+o+) ($M=1.88$) through Quadrant IV (s+o-) ($M=1.93$), Quadrant III (s-o-) ($M=1.97$), and Quadrant II (s-o+) ($M=2.05$), $F(1, 687) = 36.01, p < .001$. Overall, response latencies were shortest when outcomes to self and other were both positive, and longest when other gained while self lost.

Finally, a significant interaction was obtained, $F(15, 2061) = 4.11, p < .001$. Following Liebrand and McClintock (1988) and Dehue, et al. (1993), quadrants were arranged in order of their linear increase, and subsequent trend analyses were conducted. Similar to the previous research, response latencies of competitors contained a reliable cubic trend ($p < .01$), as well as linear and quadratic trends. This pattern was paralleled quite strongly by the response latencies of individuals adopting a minimize the difference orientation, although the cubic trend was not significant. However, a social value by quadrant ANOVA including only these two orientations revealed a non-significant social value main effect [$F(1, 131) = 0.01$] and a non-significant interaction [$F(3, 393) = 0.15$].

In contrast to this pattern obtained by "differ-

ence" oriented individuals, simple linear trends obtained across quadrants for both individualists and aggressors (p 's $<.05$), with an additional quadratic component for individualists ($p <.01$). Although an apparent quadratic function appeared for altruists, the trend was not significant. Finally, both the linear and quadratic trends were reliable among cooperators (p 's $<.05$).

To observe formally potential gender variability in response latencies, a second 4 (quadrant/outcome valence) \times 3 (social value orientation) \times 2 (gender) ANOVA was conducted on the response latencies of cooperators, individualists, and competitors only. As before, significant main effects were found for social value [$F(2,662) = 7.95, p <.001$] and quadrant [$F(3,1986) = 68.57, p <.001$], as well as an interaction between the two [$F(6,1986) = 9.48, p <.001$].

In addition, a significant gender main effect was found, with males overall having shorter response latencies ($M=1.95$) than females ($M=2.03$), $F(1,662) = 6.43, p <.05$. More importantly, however, was a significant three-way interaction between social value, quadrant/outcome valence and gender, $F(6,1986) = 2.46, p <.05$. The social value by quadrant/outcome valence interactions for males [$F(6,798) = 6.53, p <.001$] and females [$F(6,1188) = 5.20, p <.001$] are plotted separately in Figures 3a and 3b.

The pattern for males replicates nearly identically prior findings for all subjects, with the interaction being driven primarily by the crossover in response latencies between cooperators and competitors from Quadrant III (s-o-) to Quadrant II (s-o+). More specific analyses revealed reliable linear, quadratic and cubic components in the trend for male competitors, whereas the trend for male cooperators contains only reliable linear and quadratic components (p 's $<.05$).

A very different pattern emerges, however, for cooperative and competitive females. Unlike males (and prior overall findings), female competitors display a steady increase in response latencies across quadrants, with only the linear trend component being significant. Similarly, only the linear trend component is reliable for female cooperators (p 's $<.001$).

Discussion

Through the application of the assumptions of Social Value Theory in an experimental setting, considerable variability across individuals was currently observed in their relative concern for

own and other's outcomes. Further, this relative concern was related systematically to differences in response latencies to self-other choice alterna-

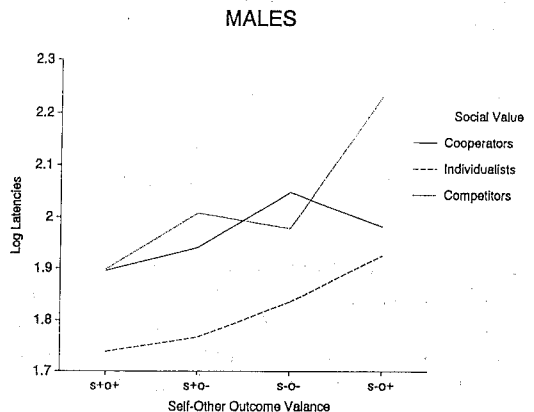


Figure 3a. Social value by self-other outcome valence for males.

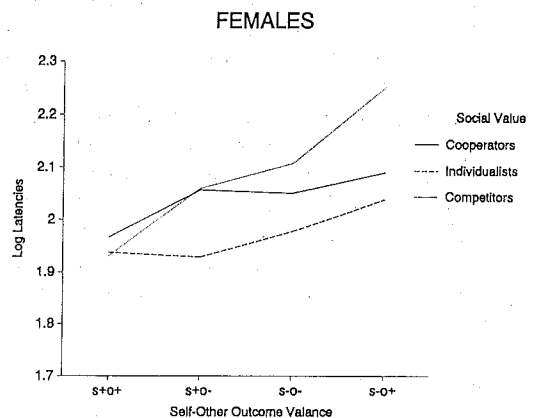


Figure 3b. Social value by self-other outcome valence for females.

tives. The current research succeeded not only in replicating previous findings obtained in several other countries (e.g., the Netherlands & the United States: Liebrand & van Run, 1985; cf. Poland: Grzelak, 1981; Germany: Schulz & May, 1989), but empirically extended them, first by identifying subjects adopting orientations not previously observed (e.g., aggression) and then by formally evaluating their response latencies relative to the other, more commonly observed orientations.

Variability in Social Value Orientations

A large percentage (44.59%) of the New Zealand university students sampled in the current study adopted a self-interested (i.e., individualistic) orientation, consistent with game theoretic assumptions. However, an equally large percentage of subjects (44.33%) was observed to adopt orientations in which either a concern was expressed for *other's* as well as own outcomes, or simply a concern for other's outcomes alone. These latter, more social orientations, entailed both positive and negative weightings of own and other's outcomes.

As noted, this basic finding of variability in the weighting of own and other's outcomes replicates prior research (e.g. Liebrand & van Run, 1985; McClintock & Liebrand, 1988). We were, however, currently able to identify several weighting patterns, or social value orientations, not previously reported. These other social values all entailed a negative weighting of own outcomes (i.e., martyrdom, masochism and sadomasochism). The observation of these social values extends prior research by demonstrating that: (1) these orientations do, indeed, occur, and (2) the Ring Measure of Social Values is suitable for their measurement.

The majority of subjects, however, adopted one of the six other social value orientations frequently observed in interdependence settings (McClintock, 1972), with 85% of the total sample adopting either cooperative, individualistic, or competitive orientations. The relative frequency with which individuals adopted these latter three orientations varied reliably with their gender. Although there were equally high levels of individualism among males and females, a higher percentage of females adopted a cooperative social value orientation, and a higher percentage of males adopted a competitive social value orientation. These gender differences may appear unsurprising given findings in, for example, the achievement literature (e.g., Helmreich & Spence, 1978) that report higher levels of competitiveness in men than women. However, research employing a social interdependence framework has been less clear.

First of all, aggregate data from, for example, Prisoner's Dilemma game play remains equivocal, with females being more competitive than males in some studies, and more cooperative in others (cf., Colman, 1982; Stockard, van de Kragt, & Dodge, 1988). The social value analysis, however, is one of identifying individual differ-

ences and not aggregating across all individuals. Simple gender t-tests within each social value category on subjects' vector angles revealed no reliable differences. Thus, within the competitive social value category, males were not more competitive than females, and vice versa for the cooperative social value category.

Overall, the observed differences between males and females are consistent with the findings of Knight and Chao (Experiment 2, 1989). Using their multiple regression analysis of preferences, they observed that, among preschool children, more girls than boys adopt minimize the difference and joint gain orientations, and more boys than girls adopt competitive orientations. In contrast, however, Liebrand and van Run (1985) (using a slightly altered version of the Ring Measure⁴) observed no gender differences in the adoption of social value orientations in their adult American and Dutch samples. Given these patterns of data we are inclined to concur with the results and conclusions of Stockard, et al. (1988), who report that the impact of situational variables is likely to be more important in promoting cooperative and competitive behaviours than gender *per se*. Indeed, given the context free nature of the Ring Measure, it is possible that males and females simply interpret the task differently.⁵

Over all subjects it is interesting to observe that, compared to previous research (Liebrand & van Run, 1985), the current data revealed a high frequency of self-interested and non-prosocial orientations. For example, 53% of Liebrand and van Run's American and Dutch samples adopted a cooperative social value orientation, whereas only 24% of the New Zealand subjects did. In contrast, an individualistic social value orientation was adopted by 45% of the New Zealand subjects, but was adopted by only 34% and 32% of the American and Dutch subjects, respectively. Finally, 16% of the New Zealand subjects adopted a competitive social value orientation in comparison to 10% of the Dutch and 5% of the American subjects. Of the other three common (McClintock, 1972) orientations, the two prosocial ones (altruism & minimize the difference) currently occurred at the same frequency (n=13) as an aggressive orientation (n=12).

These differences highlight potential cross-national variability in the relative weighting of outcomes to self and other, and suggest specific discriminating dimensions upon which to direct more formal evaluations. However, the current comparisons should be interpreted cautiously

because of differences in methods, sample size, and the passage of nearly 10 years.

Variability of Response Latencies

Again replicating previous research (Dehue, et al., 1993; Liebrand & McClintock, 1988), subjects' response latencies to the self-other choice alternatives varied systematically with their social value orientations. Consistent with the cognitive transformations assumed to underlie the expression of social value orientations (Kelly & Thibaut, 1978), individuals weighting either own or other's outcomes with zero had shorter response latencies than individuals applying non-zero weights to both and other's outcomes.

More notably, subjects' response latencies varied both with their social value orientations and with the valence of the outcomes to self and other. One of the more important features of this interaction obtained from the similarity in the response latency patterns of individuals adopting a minimize the difference orientation and individuals adopting a competitive orientation. When analyzed separately, no reliable main or interaction effects emerged between the two. These non-significant findings are to be expected (customary caution not withstanding) given that the adoption of both of these social value orientations reflects a comparison of *differences* between own and other's outcomes. This new finding provides further support to the cognitive transformation assumption of Social Value Theory.

The overall configuration of response latencies for cooperators, individualists and competitors also parallels the pattern obtained in prior research (Dehue, et al., 1993; Liebrand & McClintock, 1988). Whereas individualists maintained the shortest latencies across all quadrants, a crossover in latencies was observed between competitors and cooperators from Quadrant III (s-o-) to Quadrant II (s-o+). As observed previously (and consistent with Liebrand and McClintock's "anti-social" hypothesis), response latencies of competitors increased from the former to the latter condition. In contrast, however, the decrease predicted for cooperators by the "pro-social" hypotheses between these two conditions was not observed. As such, the current interaction was driven predominantly by different positive slope magnitudes.

Some insight is gained into this unexpected finding when the data are blocked by gender. Whereas the social value by quadrant interaction pattern for males is practically identical to the

original configuration obtained by Liebrand and McClintock (1988), the pattern for females deviates considerably. Compared to males, the ordinal relationship between the latencies of female cooperators and competitors is reversed in Quadrant III. Indeed, it is the increase in latencies for female cooperators between the s-o- and s-o+ that appears to account for the across-gender increase observed in Table 2. Far from being trivial, this observation provides the first challenge to Liebrand and McClintock's "pro-social" hypothesis. Unfortunately, however, because Social Value Theory provides no a priori reasons to expect that males and females would proceed through cognitive and motivational processes *differentially*, we must defer advancing more detailed explanations until this has at least been replicated.

The following conclusions, however, can be offered. First, there is, indeed, an underlying process, comprised potentially of both cognitive and motivational factors, that is differentially manifested in the choice behaviour latency of individuals adopting different social value orientations. The constant configuration of latencies (across subjects in two prior studies and males in the current one) provides support for this contention. Second, the observed gender differences in the current study *must* obtain from some gender related feature that has, prior to this point, been completely concealed. Indeed, the social value literature has previously not examined systematically potential inter-social value category gender differences, and such systematic evaluations would, of course, allow for clearer interpretations of these data.

Footnotes

- 1 This program was written by Ed Robinson, Psychology Department, University of Otago.
- 2 This analysis was conducted to maintain comparability to previously published work (Dehue, et al., 1993; Liebrand & McClintock, 1988). Separate analyses in which the four-level "quadrant" variable was separated into a "self" variable and an "other" variable, each with two levels (positive/negative) yielded similar results.
- 3 A more conservative criterion would have severely restricted available social value categories to be included in formal analyses, prohibiting response latency comparisons between previously observed social value orientations and those not previously observed (e.g., minimize the difference).
- 4 Liebrand and van Run (1985) sampled 16 points from

two concentric circles rather than 24 points from a single circle.

5 This observation was suggested by an anonymous reviewer.

References

- Bem, D. J., & Lord, G. C. (1979). Template matching: A proposal of the ecological validity of experimental settings in social psychology. *Journal of Personality and Social Psychology, 37*, 833-846.
- Caporeal, L. R., Dawes, R. M., Orbell, J. M., & van de Kragt, A. J. C. (1989). Selfishness examined: Cooperation in the absence of egoistic incentives. *Behavioral and Brain Sciences, 12*, 683-699.
- Brann, P. (1987). The commons dilemma and motivational orientation: Consumption of a common resource and self-interest. *Unpublished Masters Thesis*. LaTrobe University.
- Campbell, D. T. (1965). Ethnocentric and other altruistic motives. In D. Levine (Ed.), *Nebraska symposium on motivation*. University of Nebraska Press: Lincoln.
- Colman, A. M. (1982). Experimental games. In A. Colman (Ed.), *Cooperation and competition in humans and animals*. Van Nostrand Reinhold: Wokingham.
- Dehue, F. M. J., McClintock, C. G., & Liebrand, W. B. G. (1993). Social value related response latencies: Unobtrusive evidence for individual differences in information processing. *European Journal of Social Psychology, 23*, 273-293.
- Fazio, R. H. (1990). A practical guide to the use of response latency in social psychological research. In C. Hendrick & M. S. Clark (Eds.), *Review of Personality and Social Psychology*, Vol. 11. Sage: Newbury Park.
- Griesinger, D. W., & Livingston, J. W. (1973). Toward a model of interpersonal motivation in experimental games. *Behavioral Science, 18*, 173-188.
- Grzelak, J. L. (1981). Social interdependence: Do we know what we want to know? *Polish Psychological Bulletin, 12*, 125-135.
- Hamburger, H. (1979). *Games as models of social phenomena*. W. H. Freeman and Company: San Francisco.
- Helmreich, R. L., & Spence, J. T. (1978). The work and family orientation questionnaire: An objective instrument to assess components of achievement motivation and attitudes toward family and career. *JSAS: Catalog of Selected Documents in Psychology, 8*, 35, (MS. No. 1677).
- Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. John Wiley & Sons, New York.
- Knight, G. P. (1981). Behavioral and sociometric methods of identifying cooperators, competitors and individualists: Support for the validity of the social orientation construct. *Developmental Psychology, 17*, 430-433.
- Knight, G. P., & Chao, C.-C. (1989). Gender differences in the cooperative, competitive, and individualistic social values of children. *Motivation and Emotion, 13*, 125-141.
- Knight, G. P., Dubro, A. F., & Chao, C.-C. (1985). Information processing and the development of cooperative, competitive, and individualistic social values. *Developmental Psychology, 21*, 37-45.
- Kuhlman, D. M., Camac, C. R., & Cunha, D. A. (1986). Individual differences in social orientation. In H. A. M. Wilke, D. M. Messick, & C. G. Rutte (Eds.), *Experimental social dilemmas*. Peter Lange: Frankfurt.
- Kuhlman, D. M., & Marshello, A. F. J. (1975). Individual differences in game motivation as moderators of preprogrammed strategy effects in prisoner's dilemma. *Journal of Personal and Social Psychology, 32*, 922-931.
- Liebrand, W. B. G. (1984). The effect of social motives, communication and group size on behaviour in an n-person multi-stage mixed-motive game. *European Journal of Social Psychology, 14*, 239-264.
- Liebrand, W. B. G., & McClintock, C. G. (1988). The ring measure of social values: A computerized procedure for assessing individual differences in information processing and social value orientation. *European Journal of Personality, 2*, 217-230.
- Liebrand, W. B. G., & van Run, G. J. (1985). The effects of social motives on behavior in social dilemmas in two cultures. *Journal of Experimental Social Psychology, 21*, 86-102.
- Liebrand, W. B. G., Wilke, H. A. M., Vogel, R., & Wolters, R. J. M. (1986). Value orientation and conformity: A study using three types of social dilemma games. *Journal of Conflict Resolution, 30*, 77-97.
- Lynn, M., & Oldenquist, A. (1986). Egoistic and nonegoistic motives in social dilemmas. *American Psychologist, 41*, 529-534.
- MacCrimmon, K., & Messick, D. M. (1976). A framework for social motives. *Behavioral Science, 21*, 86-100.
- McClintock, C. G. (1972). Social motivation — A set of propositions. *Behavioral Science, 17*, 438-454.
- McClintock, C. G. & Allison, S. T. (1989). Social value orientation and helping behavior. *Journal of Applied Social Psychology, 19*, 353-362.
- McClintock, C. G., & Liebrand, W. B. G. (1988). Role of interdependence structure, individual value orientations, and another's strategy in social decision making: A transformational analysis. *Journal of Personality and Social Psychology, 55*, 396-409.
- Messick, D. M., & McClintock, C. G. (1968). Motivational bases of choice in experimental games. *Journal of Experimental Social Psychology, 4*, 1-25.
- Platow, M. J., McClintock, C. G., & Liebrand, W. B. G. (1990). Predicting intergroup fairness and ingroup bias in the minimal group paradigm. *European Journal of Social Psychology, 20*, 221-239.
- Rapoport, A. (1960). *Fights, games, and debates*. The University of Michigan Press: Ann Arbor.
- Schultz, U., & May, T. (1989). The recording of social orientations with ranking and pair comparison procedures. *European Journal of Social Psychology, 19*, 41-59.
- Stockard, J., van de Kragt, A. J. C., & Dodge, P. J. (1988). Gender roles and behavior in social dilemmas: Are there sex differences in cooperation and its justification? *Social Psychology Quarterly, 51*, 154-163.
- Van Lange, P. A. M., & Liebrand, W. B. G. (1991). Social value orientation and intelligence: A test of the Goal Prescribes Rationality Principle. *European Journal of Social Psychology, 21*, 273-292.