CHAPTER 4
INTERPERSONAL DIFFERENCES IN A MIXED-MOTIVE GAME;
A CROSS-CULTURAL REPLICATION

Intuitive comparisons of the American and the Dutch society would probably classify the American society as the more competitive and the Dutch society as the more cooperative. Although the research findings are not conclusive, support for this intuitive belief can be found from two different lines of research, to be discussed at some length after this introduction. The first contains studies in which an explicit American-Dutch contrast is employed (Kelley et al., 1970; Kerlinger et al., 1976, 1978). The second contains studies employing either American or Dutch subjects. In these studies, data obtained through choices in a series of Decomposed Games were used to estimate the relative occurrence of different value orientations in the own-other outcome space depicted in Figure 5 (e.g., Kuhlman & Marshello, 1975a, 1975b; Liebrand & de Hullu, 1981). The study described in this chapter integrates both lines of research. It contrasts an American student sample with a Dutch student sample and it employs two procedures for assessing value orientations, i.e., the one used in nearly all the "American subjects studies" and the one used in the "Dutch subjects studies", mentioned above.

However, that cross-cultural comparison is not the main reason for conducting Experiment 3. The main reason is the attempt to replicate the findings from Experiment 1 and Experiment 2 concerning interpersonal differences in game behavior. To increase the generality of the conditional attribution hypothesis proposed for the findings from Experiment 1 and Experiment 2, the replication was conducted in two laboratories supposed to be different with respect to social milieu. Hence, in the present study, subjects in an American laboratory as well as subjects in a Dutch laboratory, were afforded the opportunity
to choose part of a limited amount of resources in a seven-person Se-
quence Dilemma. As in the previous experiments the dependent vari-
ables consisted of the strategy and the choices actually made and the
subjects' expectations concerning others' strategies. The specific
predictions on how the dependent variables vary as a function of the
subject's value orientation, were the same as in Experiment 1 and Ex-
periment 2. The predictions will be repeated after the research find-
ings concerning cross-cultural differences have been presented.

CROSS-CULTURAL RESEARCH FINDINGS

Two prior studies relating to the topic of value orientations
have been conducted in which an identical research format was present-
ed to American and Dutch subjects (Kelley et al., 1970; Kerlinger et
al., 1976, 1978). Kerlinger (1978) compared, among other subgroups,
the negotiation behavior of an American student sample and a Dutch
student sample. The American students were more conservative and less
socialistic as measured by a basic social attitude scale. In the
second study, Kelley et al. (1970) investigated negotiation behavior
in a mixed-motive situation. The study was conducted at three European
and five United States laboratories. One of the findings was that pre-
game ratings of "typical player" and "self in the game" on the bipolar
scale "cooperative-competitive" had different connative meanings
across the laboratories. That is, in four of the five United States
laboratories, the cooperation-competition dimension was given a
"dynamism" meaning, i.e., weak and passive versus strong and active,
respectively (cf. Osgood, Suci and Tannenbaum, 1957). In two of the
three European laboratories, in Belgium and in France the dimension
was given an "evaluative" meaning, i.e., good versus bad, respective-
ly. The data from the Dutch laboratory revealed no substantial loadings on either dimension, indicating thereby a possible difference between the United States and the Dutch sample in the meaning given to the cooperation-competition dimension.

Both the Kerlinger et al. (1976, 1978) and the Kelley et al. (1970) study have the advantage of a highly similar experimental task for American and Dutch subjects. However, the findings have to be interpreted cautiously. In the Kerlinger et al. (1976) study, the Dutch student sample consisted largely of politically left-oriented students. In the Kelley et al. (1970) study, different recruitment procedures were used for the various subject samples. Consequently, between-sample differences are confounded with possible between-recruitment differences.

The second line of research consists of studies in which the assessment of value orientations by means of subject's Decomposed Games choices was part of the experimental procedure. The usefulness of these studies for the present one is limited since their design does not include a cross-cultural comparison. Culture differences between these studies in the obtained distribution of value orientations therefore are subject to varying interpretations: they may be reflections of different recruitment procedures, different experimental procedures, as well as different social milieus.

Recently, Liebrand and De Hullu (1981) presented a review of studies conducted either in the U.S.A. or in the Netherlands, in which a Decomposed Games Procedure was employed to assess value orientations in the self-other outcome space. A total of eight studies were considered, six conducted in the U.S.A. and two in the Netherlands (see Table 4). Setting aside the objections against comparing the U.S.A. data with the Dutch data, it appears from Table 4 that the percentage of American subjects classified as cooperative is about half the percentage found to apply for the Dutch subjects, while more subjects were classified as either altruistic or competitive in the United
Table 4
Percentages of subjects classified as "altruistic", "cooperative", "individualistic" or "competitive" by means of choices in a series of Decomposed Games.

<table>
<thead>
<tr>
<th>STUDIES</th>
<th>McNeel</th>
<th>Kuhlman</th>
<th>Kuhlman</th>
<th>Kuhlman</th>
<th>Bennett</th>
<th>Poppe</th>
<th>Liebrand</th>
</tr>
</thead>
<tbody>
<tr>
<td>site</td>
<td>USA</td>
<td>USA</td>
<td>USA</td>
<td>USA</td>
<td>USA</td>
<td>USA</td>
<td>USA</td>
</tr>
<tr>
<td>alt</td>
<td>--</td>
<td>9%</td>
<td>11%</td>
<td>11%</td>
<td>--</td>
<td>18%</td>
<td>4%</td>
</tr>
<tr>
<td>coop</td>
<td>13%</td>
<td>17%</td>
<td>28%</td>
<td>30%</td>
<td>19%</td>
<td>15%</td>
<td>45%</td>
</tr>
<tr>
<td>indi</td>
<td>28%</td>
<td>23%</td>
<td>26%</td>
<td>26%</td>
<td>46%</td>
<td>11%</td>
<td>27%</td>
</tr>
<tr>
<td>comp</td>
<td>49%</td>
<td>28%</td>
<td>21%</td>
<td>18%</td>
<td>24%</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>other</td>
<td>10%</td>
<td>23%</td>
<td>14%</td>
<td>15%</td>
<td>11%</td>
<td>44%</td>
<td>14%</td>
</tr>
<tr>
<td>Number of Ss.</td>
<td>96</td>
<td>205</td>
<td>167</td>
<td>128</td>
<td>239</td>
<td>98</td>
<td>132</td>
</tr>
</tbody>
</table>

States than in the Netherlands.

The findings obtained in studies contrasting other West European societies with the United States present a confused picture. Some investigators found British college students (Valliant-Dyckoff, 1977) and Flemish college students (Lefebvre & Cunningham, 1974; McClintock & McNeel, 1966a) to be more competitive than American college students. However, McClintock and McNeel (1966b) could not replicate
their previous finding in their second study: no difference in the actual choice behavior of American and Belgian subjects were found. In addition, several other investigations reported no cultural differences between the United States and several West European countries, or reported that culture effects accounted for a small proportion of variance (Brehmer et al., 1970; Cummings and Harnett, 1974; McClintock & Nuttin, 1969; Miller, 1970). Reviews of these studies may be found in Druckman, Benton, Ali and Bagur (1976) and in Toda, Shinotsuka, McClintock, and Stech (1978).

To summarize, the research findings presented above, though not equivocal, provide some reason to expect differences in social milieu between the two laboratories which were used in the present study. On the basis of the studies employing an American-Dutch contrast and on the basis of the studies depicted in Table 4, it was expected that American subjects, more often than Dutch subjects, hold competitive value orientations whereas more of the latter would hold cooperative ones.
In Experiment 3, the influence of the subject's value orientation on their choice behavior in a 7-person Sequence Dilemma was investigated in two locations: the University of California, Santa Barbara (USA), and the University of Groningen (the Netherlands). In both locations, subjects were not allowed to discuss the dilemma.

Sequence Dilemma Game Behavior. In Experiment 3, the minor change in the option selection procedure introduced in the design of Experiment 2 was maintained. Besides this change and the necessary adjustments concerning group size, all the important parameters, the number of stages, the range of stages, the range of resource choices at each decision making stage, and the average amount of resources each subject expected to be available, were identical for the three experiments.

The subjects' game behavior was measured by the variables Own Resource Choices, Relative Strategy and Relative Choice. As in the previous experiments, the variable Own Resource Choice consisted of the amount of money chosen for self across the five stages of decision making; the variable Relative Strategy consisted of a combination of the resource choices considered by the subject, minus the average of his or her expectation of others' strategies; the variable Relative Choice consisted of the choices actually made by the others in that particular decision making group.

Value Orientations. One of the possible interpretations for the distributional differences in value orientations obtained between the U.S.A. and the Netherlands (Table 4), is the type of Decomposed Game procedure used at both locations. In order to investigate this explanation, a multi-method design was used in Experiment 3. The subject's value orientation was assessed by means of two independent Decomposed
Games procedures, i.e., the modified Griesinger and Livingston procedure used in Experiment 1 and Experiment 2, and the Kuhlman and Marshello (1975 b) procedure used in four of the six American studies in Table 4. The former procedure, to be called the Geometric Procedure, yields an estimate of the weight assigned to payoff for self and the weight assigned to payoff for the other. Together, these weights then can be used to classify subjects as either "altruistic", "cooperative", "individualistic", or "competitive". On the other hand, the Kuhlman and Marshello procedure was designed to classify subjects more directly into one of the four classes of value orientations. It consists of four different types of three-alternative Decomposed Games. According to the alternatives selected, binary scores are distributed among four scales, one for each class of value orientation. The pattern of subjects' total scores on these scales then serves to classify subjects into one of the four classes of value orientations.

Predictions. Across cultures it was predicted that subjects classified as cooperative would choose about the amount of money for self that they expect others to choose; those classified as altruistic would choose less than the cooperative ones, and moreover, less than they expect others to do; those classified as individualistic or competitive both would choose more than the cooperative subjects. Furthermore, it was predicted that scores on the variable relative strategy would be positive for individualistic and competitive subjects, and that the average relative strategy score for the competitive subjects would be greater.

In addition, between cultures differences were expected to obtain with respect to the distribution of value orientations. Among American subjects relatively more competitive orientations, and among Dutch subjects relatively more cooperative orientations were expected to occur.
METHOD

Subjects. Subjects, 270 volunteers responding to an advertisement in a local university newspaper, were recruited from the local university population at Santa Barbara, U.S.A. (56 males, 75 females, average age = 21.9), and from the local university population at Groningen, the Netherlands (66 males, 73 females, average age = 21.5). Subjects were randomly assigned to 40 decision making groups, each group consisting of either six or seven persons. As in Experiment 1 and Experiment 2, subjects received the total amount of money they had chosen in the Sequence Dilemma only if the requirements were met. Namely, otherwise the American subjects received a consolation payment of $1.50 per hour, and the Dutch subjects received fl. 3,-. Throughout Experiment 3 this dollar/guilder exchange ratio was kept at 1/2 (1 dollar = 2 guilders).

PROCEDURE

A cross-cultural replication study requires a considerable attention be paid to the comparability of the experimental conditions. That is, besides the necessary high degree of comparability with previous experiments, a high degree of comparability is required between the different locations of the cross-cultural study itself. In order to increase both types of comparability, the author, who served as principal experimenter in Experiment 1 and in Experiment 2, was also the principal experimenter at both locations in Experiment 3. Furthermore, assistance was provided by three males who had served in the previous experiments, and four male research assistants at the gradu-
ate level. In addition, the extensive instructions for both the Decomposed Games Procedures as well as for the Sequence Dilemma procedure were presented in writing to the subjects. In the rare case when oral instructions were required, for example, "please make your choices for the first stage", the subjects were addressed by a native speaking research assistant.

During the first part of the session, subjects were seated in such a way that they could not see each others' response sheets. In a counter-balanced design, subjects received instructions for the two Decomposed Games procedures. These instructions served to thoroughly instruct the subjects as to how outcomes were determined by both their own choices and the choices of another subject. That other subject was identified as a person who would remain unknown and who had been randomly selected, separately for each Decomposed Game, out of the subject population to which they belonged themselves. Instructions were kept as neutral as possible. No reference was given concerning the desirability of obtaining specific outcome distributions. The Geometric Procedure was identical to the procedure used in Experiment 1 and Experiment 2. Below, Kuhlman and Marshello's decomposed game procedure is described in further detail.

After subjects had made their choices for both Decomposed Games procedures, they received the instructions for the Sequence Dilemma. In the present Sequence Dilemma, procedure subjects had to select one out of the five options employed earlier in Experiment 2. Up to this minor change in the way the options had to be selected, the present Sequence Dilemma procedure was identical to the one used in the earlier 7-person non-communicating groups. Thereafter, a quiz was administered to ensure complete understanding of the Sequence Dilemma task, and the incorrect quiz-answers were explained. During their participation in the Sequence Dilemma task, subjects were seated in a circular pattern behind small screens which prevented them from seeing each others' response sheets, while at the same time permitting them to see

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each other. Throughout the session, subjects were assigned and then addressed with a subject number ranging from 1 to 7.

Kuhlman and Marshello's Decomposed Game Procedure. Kuhlman and Marshello's procedure consists of two identical sets of 12 three-alternative Decomposed Games, designed to assess the value orientations "altruism" (A), "cooperation" (J), "individualism" (I) and "competition" (R). Each Decomposed Game falls into one of four types based upon its structure as regards the combination of values available: Type 1: (a)-IR, (b)-JA, (c)-N; Type 2: (a)-IJA, (b)-R, (c)-N; Type 3: (a)-I, (b)-R, (c)-JA; Type 4: (a)-IRJ, (b)-A, (c)-N. The notation indicates the dominant alternative (a,b, or c) with respect to the value orientations (A, J, I, and R). The letter N implies that that alternative is dominant in regard to none of the value orientations. For example, the (a)-IR, (b)-JA, (c)-N type indicates that individualistic and competitive value orientations lead to the selection of alternative A, that alternative B is dominant for cooperative and altruistic value orientations, and that alternative C is dominant in regard to none of these value orientations. An example of such a game (the IR, JA, N-type) is shown in Table 5. Except for one game, the numerical values of the 24 Decomposed Games used correspond to those found in Kuhlman and Marshello (1975 b). The numerical values of alternative C in the game: self: a-90, b-70, c-60; other: a-10, b-20, c-20, were changed into self: c-60, other: c-10, so as to make alternative b dominant with respect to altruism.

Following Kuhlman and Marshello (1975 b), subjects were paid a small amount of money based on the total amount of points they accumulated as a result of both their own and other's choices. They received 5 dollar cents for each 100 points; the maximum amount of money paid for participating in the Kuhlman and Marshello procedure was $1.30.

Subject's choices were converted to scores on four scales, one for each value orientation. Each time the subject selected an alternative prescribed by one or more of the value orientations, a score of
Table 5
Example of a decomposed IR, JA, N game

<table>
<thead>
<tr>
<th>alternatives</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>I receive</td>
<td>50</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>The other</td>
<td>10</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>receives</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6
Score patterns resulting from choosing 100% consistent with a single value orientation

<table>
<thead>
<tr>
<th>A-scale</th>
<th>J-scale</th>
<th>I-scale</th>
<th>R-scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>altruism</td>
<td>24</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>cooperation</td>
<td>18</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>individualism</td>
<td>6</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>competition</td>
<td>0</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

+1 was added to the corresponding scale(s). For example, selecting alternative A in the IR, JA, N-type resulted in a score of +1 for the "individualism-scale" and the "competition-scale", and a zero score for each of the remaining scales. Total score patterns resulting from choosing in perfect consistency with each of the value orientations,
are shown in Table 6. Again, following Kuhlman and Marshello (1975 b), subjects were classified according to their highest scale score, provided that within each type of game, at least 50% of their choices were consistent with a single value orientation. Partly because of the overlap between scales (see Table 6), in the present study, 20 subjects made choices which were to exactly the same degree ( > 50% ) consistent with two adjacent value orientations (Table 6). In that case, out of the two value orientations, the orientation representing the lesser concern for other's outcomes was assigned.

RESULTS

The two Decomposed Games Procedures. There are several ways to estimate the internal consistency of the two Decomposed Games Procedures used to assess subject's value orientation. First, the percentage of choices consistent with the value orientation assigned can be calculated. For the three-alternative Kuhlman and Marshello Procedure this percentage is 87, for the two-alternative Geometric Procedure this percentage is 84. However, making choices in a completely random way, results in consistency percentages of 33 and 50, respectively. Since both Decomposed Games Procedures consist of two parts supposed to be exchangeable, the Spearman-Brown index for reliability may be more appropriate. The Spearman-Brown coefficient for the Kuhlman and Marshello Procedure averaged over the four scales shown in Table 6, is .93; the corresponding index for the Geometric Procedure is .88.

Convergent and discriminant validities are shown in Table 7 and Table 8. As predicted by the two-dimensional own-other outcome model (Figure 5), the correlations in the top row of Table 7 should range from highly positive to highly negative. That is, there should be a
Table 7

Pearson product-moment correlations between Geometric Procedure Scales and the Kuhlman and Marshello Scales (N = 268)

<table>
<thead>
<tr>
<th>Kuhlman and Marshello Procedure</th>
<th>A-scale</th>
<th>J-scale</th>
<th>I-scale</th>
<th>R-scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinate on OTHER - axis</td>
<td>.54</td>
<td>.48</td>
<td>-.37</td>
<td>-.54</td>
</tr>
<tr>
<td>Coordinate on OWN - axis</td>
<td>-.28</td>
<td>.05</td>
<td>.46</td>
<td>.29</td>
</tr>
</tbody>
</table>

descending order between the coordinate on the OTHER-outcome axis, estimated by means of the Geometric Procedure, and the Kuhlman and Marshello scales for altruism, cooperation, individualism and competition. In the bottom row of Table 7, it is expected that the highest correlation coefficient is the one between the coordinate on the OWN-outcome axis and the individualism-scale, intermediate coefficients are expected for the competition-scale and the cooperation-scale, and finally a negative correlation is expected to occur for the altruism-scale. Though the .05 correlation in the bottom row of Table 7 is relatively low compared to the corresponding correlation in the top row of Table 7, it is concluded that the coefficients in general fit the predicted pattern.

Subject's coordinates on the two axes of the own-other outcome plane determine the estimated value vector by means of the Geometric Procedure. Subjects were classified according to the direction and slope of this estimated value vector (Figure 5). In Table 8, the pro-
Table 8
Crosstabulation of the classifications provided by the Geometric Procedure and the Kuhlman and Marshello Procedure
A = altruism; J = cooperation; I = individualism; R = competition

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>J</th>
<th>I</th>
<th>R</th>
<th>TOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuhlman and Marshello</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>9</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Geometric Procedure</td>
<td>48</td>
<td>64</td>
<td>16</td>
<td>2</td>
<td>130</td>
</tr>
<tr>
<td>J</td>
<td>3</td>
<td>29</td>
<td>41</td>
<td>5</td>
<td>78</td>
</tr>
<tr>
<td>I</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>R</td>
<td>61</td>
<td>95</td>
<td>63</td>
<td>17</td>
<td>236</td>
</tr>
</tbody>
</table>

portion of agreement between the nominal scales of both Decomposed Games Procedures is shown. Using the disagreement weights, 0 (diagonal), 1 (adjacent diagonals), 4 (next diagonals) and 9 (upper right and lower left corner), the weighted Kappa coefficient (Cohen, 1968), is .55 (95% confidence limits are .45 and .64).

Culture and sex effects in value orientations. The hypothesis that there are distributional differences in value orientations between American and Dutch subjects was analyzed by means of a Chi-Square test utilizing the Kuhlman and Marshello classification data. A culture by value orientation classification is presented in Table 9. The obtained Chi-Square provides no support for the cross-cultural
differences hypothesis (Chi-sq(3) = 2.9, n.s.) In addition, culture
differences in scores on the two continuous variables resulting from
the Geometric Procedure were analyzed. For American subjects the aver-
age on the variable corresponding with concern for own outcomes is
19.07, the average for Dutch subjects is 19.97. The average on the
variable corresponding with concern for other's outcomes is 9.92, and
8.07 respectively. A multivariate analysis of variance with the two
Geometric Procedure variables as dependent variables yielded no sig-
nificant univariate or multivariate effects (F(2,265) = 1.57).

Using the two variables resulting from the Geometric Procedure,
i.e., a subject's coordinate on OWN and OTHER's outcome axis, as
dependent variables, a multivariate analysis of variance with sex as
between subjects factor yielded no significant sex effect (F(2,265) =
1.54). For the earlier 7-person groups of Experiment 1, the
corresponding index was also non-significant (F(2,119) = 1.96). However,
for the 20-person groups of Experiment 2 the effect for sex was
significant (F(2,98) = 3.27, p < .05). Besides consistently over all
three experiments, the coordinate on own-outcome axis is higher for
males than for females (overall mean: 19.05 and 16.78, respectively);
and the coordinate on the other-outcome axis is lower for males than
for females (M = 7.33 and M = 8.70, respectively).

To summarize, none of the above analyses support the notion of
differences between American and Dutch subjects concerning the rela-
tive occurrence of value orientations. In addition, it appears from the
results obtained by means of the Geometric Procedure, that the concern
for others' outcomes is higher for females than for males.

Culture and sex effects in Sequence Dilemma behavior. After ad-
justments concerning group size were made, the average amount of money
requested by the 20 seven-person Dutch decision making groups is $103
(sd = 5.97), the average for such American groups is $102 (sd = 6.84).
In one of the 40 groups, the total amount of money chosen across
stages exceeded the highest possible pool size; in 4 of the 40 groups
Table 9
Crosstabulation of subjects classified by means of both Decomposed Games Procedures, broken down for culture; entries are percentages of row totals; the first one refers to the Geometric Procedure

<table>
<thead>
<tr>
<th></th>
<th>altruistic</th>
<th>cooperative</th>
<th>individualistic</th>
<th>competitive</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>4;27</td>
<td>53;37</td>
<td>33;27</td>
<td>10;9</td>
<td>136;126</td>
</tr>
<tr>
<td>United States</td>
<td>5;25</td>
<td>55;44</td>
<td>35;26</td>
<td>5;5</td>
<td>128;113</td>
</tr>
<tr>
<td>Total number</td>
<td>11;63</td>
<td>143;95</td>
<td>91;64</td>
<td>19;17</td>
<td>264;239</td>
</tr>
</tbody>
</table>

that amount was lower than the lowest possible pool size. For the remaining 35 decision making groups, the average probability of receiving the amount of money chosen was .59.

The comparability of the stimulus situation for the subjects within each location was analyzed by comparing observed groups to groups with subjects randomly assigned. That is, the variability between decision making groups in the total amount of money chosen across stages and subjects was compared to the variability of statistical groups. The analysis indicated that the observed by statistical group variability ratios both the Dutch (F(19,19) = .33) and American subjects (F(19,19) = .45) was not significant. Hence, in the following subjects will be taken as units of observation.

The average amount of money chosen for self across Dutch subjects was $14.73 (sd = 4.19), while the American subjects on the average chose $14.63 (sd = 4.82). A 2 x 2 univariate analysis of variance with Own Resource Choices as dependent variable, and with culture
(Neth. - U.S.A.) and sex as the two between subjects factors, yielded no main effect for culture, and no culture by sex interaction. As in Experiment 1 and Experiment 2, the main effect for sex is significant ($F(1,266) = 5.97, p < .05$). Males chose $15.42 for self and females requested $1.34 less than males. Thus, in the present research it appears that females behave in a less self-interested way than males.

The amount of money chosen as a function of stage of decision making, broken down for culture and for sex, is shown in Figure 11. The five resource choices made by each subject were analyzed using a 2
x 2 analysis of repeated measures model (Finn & Mattson, 1978), with culture and sex as the two between subjects factors and stages as the within subjects variable. The analysis yielded significant univariate and multivariate effects for the linear and quadratic trends \((F(2,265) = 126.7, \ p < .05)\). Besides the polynomials by culture interaction \((F(2,265) = 8.65, \ p < .05)\), no further interactions were significant.

In the same way as was done in Experiment 1, the polynomials by culture interaction was analyzed in further detail. It appeared that for the Dutch subjects the linear polynomial accounted for 89%, and the quadratic polynomial for 10% of the total effect variance. For the American subjects, these proportions were 96% and 3% respectively.

**Effects of value orientation on Sequence Dilemma behavior.** As in the previous experiments, the hypothesis that value orientation affects decision making in the Sequence Dilemma, was analyzed by means of the variables RELATIVE STRATEGY and RELATIVE CHOICE. Again, relative strategy consists of the differences between subject's strategy and the average of the expectation of others' strategies, one difference score obtained for each stage. Relative choice corresponds to the total amount of money a subject chose for self across stages, minus the average amount which was actually chosen by the others in that particular group. Figure 12 depicts the scores on these two dependent variables for subjects classified apriori by means of the Geometric Procedure, into one of the four classes of value orientations. In Figure 13, the same variables are shown; this time the subjects are classified by means of the Kuhlman and Marshello Procedure.

As is predicted by egocentric attribution theory (Ross et al., 1977), there are no significant differences between the classes of value orientation in first-stage relative strategy data, and moreover, the hypothesis that the grand mean would be zero cannot be rejected. According to the conditional attribution hypothesis proposed in Chapter 3, differences as a function of subjects' value orientations in relative strategies and relative choices should obtain, after in-
Figure 12
Relative strategies for four classes of value orientations by stage and relative choice across stages for four classes of value orientations; classification by the Geometric Procedure; COMP = competitive, n = 19; IND = individualistic, n = 91; COOP = cooperative, n = 143; ALT = altruistic, n = 11.

formation concerning others' behavior is released. The data reveal that there are significant differences in stage-5 relative strategies as a function of value orientations. Both for the Geometric value classification (F(3,254 = 6.4, p < .05) and for the Kuhlman and Marshello classification procedure (F(3,231 = 4.8, p < .05). At the end
of the decision making process, the pattern of relative strategies in general fits the predicted pattern for both value classification procedures. The one exception concerns the relative strategy data for subjects classified by means of Kuhlman and Marshello's Procedure as either individualistic or competitive. However, the relative choice data for these subjects are consistent with the predicted pattern. Overall, it is concluded that the relative strategy data, depicted in Figure 12 and Figure 13, support the conditional attribution hypothesis.

In addition, subjects' relative choices (Figure 12, Figure 13), indicate the effect of their value orientation upon their choice behavior in the Sequence Dilemma. Using the variable relative choice as dependent variable, two regression analyses were carried out with the two coordinates resulting from the Geometric Procedure and three dummy variables for the Kuhlman and Marshello Procedure as predictor variables. The first analysis yielded a significant joint effect for the Geometric Procedure predictors \( F(2,236) = 5.2, p < .05 \); the Kuhlman and Marshello Procedure did not account for a significant proportion of the residual variance (Mult. R = .27). Changing the order of the predictor variables in the second analysis yielded a significant effect for the Kuhlman and Marshello predictors \( F(3,235) = 4.4, p < .05 \). This time, the additional proportion of variance accounted for by the Geometric Procedure was not significant.

Finally, the differential accuracy hypothesis — that altruistic and cooperative subjects (Group 1) would be less accurate in predicting the overall amount of money chosen by others — than competitive and individualistic subjects (Group 2) was tested. As in the previous experiments, the difference between relative strategy scores at stage 5 and relative choices served as dependent variable in an analysis of variance with the two groups of value orientations as between subjects factors. As in Experiment 1, the analysis yielded no significant distinction between the two groups of subjects \( F(1,262) = \)
Figure 13
Relative strategies for four classes of value orientations by stage and relative choice across stages for four classes of value orientations; classification by the Kuhlman and Marshello Procedure; COMP = competitive, n = 16; IND = individualistic, n = 66; COOP = cooperative, n = 98; ALT = altruistic, n = 63.

Since support for the differential accuracy hypothesis has only been found in Experiment 2, it is concluded that in the present research, the differential accuracy phenomenon is not consistent.

To summarize, no meaningful differences between American and Dutch subjects in decisional behavior in the Sequence Dilemma were ob-
tained. Consistent with the findings from Experiment 1 and Experiment 2, in the present study the conditional attribution hypothesis was supported.
GENERAL DISCUSSION

Interpersonal Differences. In the present cross cultural replication, all the major findings of Experiment 1 and Experiment 2 concerning the relationship between own behavior and expected behavior of others were replicated. Consequently, the generality of the relevant Experiment 1 and Experiment 2 findings is increased considerably. First, the egocentric attribution hypothesis that subjects' own intended behavior matches the behavior of others, is supported only when no feedback concerning others' behavior is provided. In addition, given some information on others' behavior, the conditional attribution hypothesis explains the results in a more appropriate way. The consistent support of the conditional attribution hypothesis limits two observations made by Dawes et al. (1977) regarding the relationship between one's own behavior and one's expectations about how other people will behave. Dawes et al. (1977) permitted subjects to indicate the decision they believed each of the other persons would make, after subjects had made their own choice but before any feedback concerning the distribution of choices was given. Based on the subjects' behavior, Dawes et al. conclude, "the act of making a choice considered ethical or rational may define the situation for the chooser as one requiring ethicality or rationality and hence bias the chooser to believe that others will behave in a similar ethical or rational manner" (p. 11). The present findings suggest that Dawes' conclusion is restricted to situations where no information on others' behavior is available and to subjects having a cooperative or individualistic value orientation.

The second limitation requires a more intricate line of reasoning. As Dawes (1980) points out, exploitative behavior may be explained in two rather different ways. First, "to the degree to which
a subject believes others WON'T defect, he or she may feel it is possible to obtain a big payoff without hurting the others too much"; and second, "to the degree to which a subject believes others WILL defect, he or she may feel that it is necessary to avoid a big loss by defecting himself or herself" (p. 187). On the basis of the positive correlations between propensity to cooperate and the belief that others will cooperate, reported by Dawes et al. (1977), Marwell and Ames (1979), Tyszka and Grzelak (1976), Dawes (1980) goes on to conclude that the latter is the more likely explanation of exploitative behavior. However, the present findings point to the existence of a subgroup consisting of competitive subjects, characterized by high relative strategy scores. That is, competitively oriented subjects while becoming more and more aware of the fact that they taking more out of the common pool than the others, persist in this behavior. Consequently, in the present research, Dawes' former explanation receives some support.

Solutions to Social Dilemmas. As stated in Chapter 3, in addition to the question concerning interpersonal differences in social dilemma situations, the question arises as to how to promote the kind of behavior which serves the common interest. Recently, Platt (1973), Punter (1982), and Wilke, Liebrand and Messick (1982), presented reviews containing possible strategies for promoting cooperation derived from n-person game research. The solutions presented are not equally compelling. First, there are solutions which in essence boil down to an appeal to conscience. Besides the explicit appeals to conscience, which are to be found for example in many energy conservation campaigns, information campaigns, directive at making the social dilemma structure visible, may be considered an appeal to conscience too. What else could be the reason for providing that information? A more compelling class of solutions can be found in those solutions based on changed reinforcement relations. Platt (1973) presents a fairly exhaustive review of possible reinforcement changes in order to prevent
or escape from different social dilemmas. According to empirical (Brechner, 1977; Caldwell, 1976; Kelley & Grzelak, 1972; Liebrand, 1980; Wilson, 1977) and theoretical research findings (Hardin, 1968; Platt, 1973) the more powerful solutions to social dilemmas have to be found within the latter class.

Cultural Differences. One striking finding concerns the results of the cross cultural comparison conducted in Experiment 3. Contrary to the hypothesis based on the Kelley et al. (1970) study, the Kerlinger et al. (1976, 1978) study, and the studies depicted in Table 4, no indications of cross-cultural differences were found. It was concluded previously that differences in social milieu, as well as differences in experimental procedures or differences in subject recruitment procedures or any combination thereof, could have been the appropriate interpretation for the culture differences obtained in prior research. The design of the present cross-cultural study permits a less ambiguous interpretation. Excluding differences in experimental and recruitment procedures, it was concluded that the social milieus at both locations are remarkably similar. Hence, as will be argued below, the culture differences derived from the Table 4 studies are most likely generated by two sources of bias: differences in experimental and differences in recruitment procedures.

First, the differences in experimental procedures between the existing American and Dutch studies (Table 4), may reflect variations in the type of Decomposed Games Procedures used to assess value orientations. The influence of such method-bound bias can be seen in Table 9. Within cultures, The Kuhlman and Marshello Procedure classifies more subjects as altruistic and fewer subjects as cooperative than the Geometric Procedure.

The second source of bias consists of differences in recruitment procedures. In all the American studies out of Table 4, subject's participation served as a partial fulfillment of an experimental participation requirement. In contrast, in Experiment 1, 2 and 3, sub-
jects were paid volunteers. Consequently, differences with respect to incentive and with respect to the act of volunteering exist. As for the act of volunteering, Rosenthal and Rosnow (1969) point out that among other characteristics, volunteers more often than non-volunteers tend to be more approval seeking, less authoritarian, and more sociable. Though students required to serve as research subjects cannot be considered non-volunteers —— they often have a choice among alternative experiments —— they cannot be considered to be true volunteers either. In terms of value orientations, it can be expected that paid volunteers will have more concern for others than subjects fulfilling course requirements. With respect to the kind of incentive received, Kelley et al. (1970) point out that the money incentive for the subjects of the present experiments may have evoked a different definition of the experimental task with a corresponding difference in the behavioral norms considered to be appropriate. In their experiment, they found that subjects within the money condition rated both self and the typical person as more honest and cooperative than did subjects within the points condition.

Additional evidence for the hypothesis that subject recruitment procedures affect the distribution of value orientations obtained, can be found from the results of a pilot study conducted in Santa Barbara (USA) shortly before the performance of Experiment 3 (Van Run, Note 5). In that pilot study, 71 undergraduates participated to fulfill experimental experience requirements. As expected from the above line of reasoning, the average score on the variable corresponding with concern for other's outcomes, as measured by the Geometric Procedure, was about twice as low in the pilot study as in the USA condition of Experiment 3 \( t(200) = 2.87, p < .05 \). There was no significant difference in average score on the variable concern for own outcomes between the two groups.

To summarize, the hypothesis concerning cross-cultural differences in value orientations between the American and Dutch locations
is not supported. It is argued that the prior indications for cross-cultural differences, discussed in the introductionary section of this chapter, most likely are reflections of differences in experimental and recruitment procedures.

A final note. In the experiments conducted thus far a high affect level has been observed. Both on the answer sheets and in the discussions afterwards, comments such as "I'm beginning to believe that even in such small groups not everyone is to be trusted", frequently were made. Furthermore, the atmosphere in the decision making groups was oppressive. Nervous giggles alternated periods of silence, a situation which lasted until finally the pool size was drawn and subjects knew with certainty the amount of money they would receive. As was pointed out before by Dawes (1975) and Bonacich (1976), the social dilemma game paradigm confronts the subject with a rather simple though compelling task. It is the author's conviction that social dilemma games, in which subjects participate for relatively low amounts of money, is one of the best research tools available for the study of human behavior in social interdependency situations. To paraphrase, generalizations based upon subject's behavior in a social dilemma laboratory task, may be more valid than generalizations based upon answers on personality inventories or questionnaires concerning the subject's attitude towards real-life problems.