

# Stability, reliability and validity of social value orientation

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## Abstract

Social value orientations are often regarded as stable individual differences in other-regarding preferences - the concern for equality and joint outcomes - affecting the propensity to cooperate in experimental social dilemma situations. Despite the widespread use of measures of social value orientations in social dilemma experiments, little is known about their stability, reliability and validity. Study 1 examines the longitudinal stability of social value orientations, showing that the stability coefficient of a linear measure of social value orientations in a panel survey over 19 months is only .22, correcting for measurement errors. Study 2 shows that the degree of altruism displayed in decomposed games and the classification of respondents in types of social value orientations depends on the place of the measurement procedure in a questionnaire, threatening their validity. When social value orientations are measured in a survey after behavioral questions on charitable giving, the proportion of 'cooperators' increases from 41% to 57%. Priming effects may be the reason for the low stability of social value orientation. Study 3 shows that priming effects also disturb the relationship of social value orientation with behavioral criteria such as volunteering and donations to charitable causes. Social value orientations are correlated with giving and volunteering behavior in the predicted pattern when social value orientations are measured before the behavioral questions. However, when social value orientations are measured after the behavioral questions, their predictive power declines.

Keywords: social value orientation; priming; cooperation; charitable giving

JEL Classification: A13, C99, D64 ; H40

## **Introduction**

In a variety of experimental social dilemma situations designed to rule out other-regarding behavior, a sizeable minority of people still display non-selfish behavior (Camerer, 2003; Dawes & Thaler, 1988; Eckel & Grossman, 1996; Ledyard, 1995). Although such behavior can also be explained as the result of ‘confusion’ (Andreoni, 1995; Houser & Kurzban, 2003) or limitations of experimental methods such as a lack of anonymity (Eckel & Grossman, 1996), other-regarding preferences are an obvious explanation for other-regarding behavior. Social psychologists usually try to capture such other-regarding preferences with measures of ‘social value orientations’ (Kuhlman & Marshello, 1975; McClintock, 1972; Van Lange, 2000). Measures of social value orientations reflect two different types of other-regarding preferences in social dilemma situations: the concern for the well-being of others (or altruism) and the concern for equality (fairness). Social value orientations are often considered as ‘individual differences’: stable personality characteristics that persons bring with them into the laboratory beyond the experimenter's power (McClintock & Van Avermaet, 1982; Van Lange, 1991; Ligthart, 1995, p. 132-133; Snijders, 1996, p. 17; Perugini & Gallucci, 2001; Hulbert, Corrêa da Silva & Adegboyega, 2001; Van Dijk, Sonnemans & Van Winden, 2002). However, previous research indicates that the longitudinal stability of social value orientations is not very high, while evidence for the predictive validity of social value orientation measures for prosocial behavior outside the laboratory is scarce.

The goal of this paper is to assess the reliability and longitudinal stability of social value orientations, and to investigate their predictive validity for prosocial behavior outside the laboratory. Study 1 investigates whether the low stability of social value orientation is due to unreliability, concluding that it is not because the measure is very reliable. Study 2 investigates whether the low stability of social value orientations is due to a low internal validity of the measure and concludes that this is the case. The validity of decomposed games as a measure of other-regarding preferences is volatile, strongly depending on the context in which such measures are taken. Study 3 investigates the consequences of the volatility of measures of social value orientation for its predictive validity, concluding that social value orientations are correlated with behavioral criteria outside the laboratory only when they are measured context-free.

## Measurement of Social Value Orientation

First, the measurement of social value orientation will be discussed. Usually, the measurement procedure is introduced to participants in experimental games as in table A of the appendix (taken from Van Lange, Otten, De Bruin & Joireman, 1997). After this introduction, nine tables closely resembling the one in the example are presented to the respondents. The table is called a 'decomposed game' because it emphasizes that the respondent determines the outcome of both herself and the 'hypothetical other', so that there is no interaction (Kuhlman & Marshello, 1975). The idea behind giving respondents decomposed games is that the choices made reveal the utility function of the respondent. Usually, three different utility functions, corresponding to three different types of social value orientations, are considered: (1) a cooperative orientation, reflecting a preference for joint (collective) outcomes, (2) an individualistic orientation, reflecting a preference for own outcomes, (3) a competitive orientation, reflecting a preference for a large positive difference between own and other outcomes (McClintock, 1972). In economics, persons with 'individualistic orientations' are described as 'selfish' and persons cooperative orientations are described as having Leontief preferences (Andreoni & Miller, 2002).

In the example, distribution A will be the dominant choice for a player who follows an individualist allocation rule: the pay-off for the respondent (550) is more than in the other two distributions (both 500). Distribution B will be the dominant choice for the cooperative player, because the sum of both pay-offs is higher (1000) than in distribution A (850) and C (600). Distribution C will be chosen by a competitive player, because in this distribution the difference between the number of points for self and the number of points allocated to the other is larger ( $500-100=400$ ) than in distributions B (0) and C (250). Because each of the alternative distributions satisfies exactly one of these three rules, this measurement technique of social value orientations is called the 'triple dominance' format.

Usually, respondents are classified as belonging to one of the three types when they make six or more consistent choices in the nine games. Respondents failing to meet this criterion are disregarded. Unfortunately, the classification of respondents into types ignoring inconsistent respondents has become common practice in social psychology. There are two problems with this practice. The first problem concerns using types. Classification of respondents into types results in a nominal variable with three categories. The differences among the three types are considered to be completely qualitative. This is a strange assumption, because the difference between individualists and cooperative respondents for

instance is supposed to be determined completely by the difference in the value that the respondents attach to the outcome for the other: individualists are believed to attach no value at all to the outcomes of the other, while cooperative respondents are believed to attach equal importance to outcomes for themselves and for the other. It would be better to assign a parameter to all respondents reflecting their concern for the outcomes of the other. Such an altruism parameter has the advantage that it is a continuous variable. The choices in the decomposed games can be transformed easily into such an altruism parameter by taking the ratio of the outcomes for the 'unknown other' to the joint outcomes. This parameter expresses the percentage of the total pay-off in a game given away to the anonymous other. For example, in distribution B in the example given above, the altruism parameter is 0.50 ( $500/500+500$ ); in distribution A it is 0.35 ( $300/850$ ) and in C it is 16.7 ( $100/600$ ). For each of the nine decomposed games, the choice made can be transformed into an altruism parameter (see appendix, table B).<sup>1</sup>

The second problem concerns the treatment of inconsistent respondents. The rationale for disregarding inconsistent respondents seems to be that those who 'did not understand the decomposed games' should not be used because their answers do not reflect a specific social value orientation. In an ordinary survey, mostly consisting of dichotomous (yes-no) questions and Likert-items (ranging from 1 = completely disagree to 5 = completely agree), the decomposed games are a very different sort of question. Respondents may have difficulty understanding the question, because it requires some basic level of mathematical ability. It can be expected that older and lower educated respondents will experience problems with the decomposed games. Ignoring those with inconsistent choices may lead to a systematic bias in the sample. Another reason why respondents may choose inconsistently is because they simply do not have clear-cut social value orientations. Disregarding these respondents artificially increases the explanatory power of social value orientations. As a parallel, consider the study of voting behavior. Political scientists have noted that it is difficult to explain the voting behavior of citizens who have little interest in politics because they often do not have consistent political-ideological orientations (Huckfeldt, Levine, Morgan & Sprague, 1999; Converse, 1964). However, we would not accept explaining voting behavior by limiting our sample to those with a strong interest in politics. When only those citizens with consistent social value orientations (read: strong political opinions) are considered, this would conceal that social value orientation (political opinion) has little value for the prediction of prosocial behavior (voting behavior). Taking the mean of all altruism parameters

for the nine decomposed games generates a continuous variable indicating the concern for the other's welfare. Those with inconsistent social value orientations will get an altruism parameter with a large variance around the mean. With this procedure, all respondents are kept in the analysis.

## **Study 1**

### **Reliability and stability of social value orientation**

#### *Introduction*

Although researchers tend to think of social value orientations as stable individual differences, the empirical evidence on the longitudinal stability of social value orientation is not very promising. Buckley et al. (2001) report changes in social value orientations by 20% of subjects after an ‘unrelated decision making task’ that took only 20 minutes within the same experimental session. Liebrand & Van Lange (1989, p. 75) mention an unpublished research paper reporting a two-month stability coefficient of .81. Kuhlman, Camac & Cunha (1986, p. 159-160) argue that the stability of social orientations is high, but they do not produce a reliability coefficient. Over a period of six months, Van Lange & Semin Goossens (1998) found that 75% of their participants had stable social value orientations. Van Lange (1999, note 6), using the same data as this study, mentions that 59% of the respondents in a computerized survey had consistent social value orientations over a period of 19 months. This is not very high. Comparing the three studies, one can see that the stability declines rapidly as the time lag lengthens. This pattern of declining stability gives rise to the suspicion that social value orientations are subject to considerable change over time. However, previous research did not take account of measurement errors. When two measures of the same, allegedly stable, latent construct do not correlate highly with each other over a period of time, there are two possibilities: either the construct itself is not stable, or the construct is unreliably measured. As a general rule, measurement errors decrease stability coefficients. Models that account for measurement errors give a more accurate estimate of the stability of latent constructs such as social value orientations. The larger the measurement errors, the more that stability coefficients produced by structural equation models exceed simple correlations.

This study presents a structural equation model to derive a more accurate estimate of the stability of social value orientations, taking account of measurement errors. Furthermore, this study investigates whether the stability differs by age group, as many personality measures do. Two recently published meta-analytic reviews of consistency in personality (Roberts & DelVecchio, 2000; Ardelt, 2000) show that the stability of individual differences varies over the life course. In a meta-analysis of more than 200 stability coefficients reported in personality psychology, Ardelt (2000) found that the stability of personality characteristics

generally increases until the age of 50, after which it declines again (Ardelt, 2000). Drawing upon an even larger database of more than 3,000 coefficients, Brent & Roberts (2000) showed that the mean trait consistency increases linearly from infancy to old age, with a slight drop in the 40-49 year old category. To investigate whether the stability of social value orientations also varied with age, separate analyses were conducted for separate age groups. To avoid low numbers of respondents, only three age groups were created, consistent with the empirical results of Ardelt (2000): 18 to 30 year olds, 31 to 50 year olds, and those aged 50 and over.

## *Method*

### *Participants and design*

The 'Telepanel' is a pool of about 5000 respondents in households in The Netherlands, who participate in regular poll surveys in exchange for a computer, which is also used to collect the poll data. Weekly surveys are completed by random samples of about 1,000 to 2,000 respondents in the panel and cover a wide variety of topics. In the present study, two episodes are used: (1) a first survey of social value orientations in May 1994 (n=1728), (2) a second survey of social value orientations in December 1995 (n=2360). Both surveys were conducted through the Internet. Unfortunately, households were not asked to have the same members of the household complete the social value orientation procedure in the second survey. Of the 1728 respondents in 1994, 46.6% participated again in 1995 (n=805). Both of these surveys have been used in previous studies by other authors, who provide details on the sampling procedure and representativity of the original datasets (Van Lange et al., 1997; Van Lange, 1999). To ensure that the estimate of stability was not affected by selective panel attrition, a logistic regression analysis of panel attrition was conducted. This analysis showed that panel attrition was not selective with regard to social value orientations: Attrition rates were 50.4% for inconsistent, 52.8% for cooperative, 54.4% for individualistic, and 59.7% for competitive respondents, respectively (Chi Square = 2.67, df=3, p<.446).

### *Procedure*

In 1994, social value orientations were assessed with the first six decomposed games shown in table B of the appendix in the traditional triple dominance format as in previous research (for more details, see Van Lange, Otten, De Bruin & Joireman, 1997 and Van Lange, 1999). Following the procedures used in previous research, 71,2% of the participants were

classified as cooperative, 21,3% as individualistic, and 7,5% as competitive (see table 1). Besides this categorical classification, an altruism-parameter was computed, in order to compute linear correlations in future analyses. The altruism parameter (see appendix, table B) expresses the percentage of the total pay-off in a game given away to the anonymous other. The mean altruism parameter of cooperative respondents over all six games was close to 50, indicating that they consistently give away about 50% of the points to the 'unknown other'; individualistic respondents gave a mean 36% of all points, and competitive respondents gave away about 17% of all points. The average altruism parameter of inconsistent respondents is almost equal to the average altruism parameter of individualists. A reliability analysis of the six altruism parameters revealed a stunning Cronbach's alpha coefficient of .96, indicating that measurement unreliability was minimal.

Table 1 about here

In December 1995, a second study on social value orientations was conducted among the respondents of the Telepanel. The measurement procedure was the same as in 1994, except that in 1995 the participants were reminded with every decomposed game that "the other is an unknown other" (Van Lange, 1999). Table 2 shows the distribution of social value orientations in this survey and the mean altruism parameters for these categories.

Table 2 about here

The proportion of cooperative respondents in 1995 was lower than in 1994, while the proportion of individualists and competitors was higher in 1995. It is possible that a number of respondents classified as cooperative in 1994 moved to individualism and competition in 1995. Comparing the distributions among the consistent respondents only, the same differences emerge. The altruism parameters for the four types of social value orientation were very similar. The social value orientations measured in 1995 showed higher standard deviations. It seems that the responses in the 1995 procedure contained more error variance in general. Still, Cronbach's alpha for the six decomposed games in 1995 was very high: .93. The structural equation model, discussed below, provides a good method to account for this measurement error and give an estimate of the individual stability.

## *Results*

The stability of social value orientations is investigated by matching the social value orientations measure from May 1994 with the measure from the second study from December 1995. According to table 3, the stability of social value orientations over a period of 19 months is low. Only 44.8% of the participants had stable social value orientations.<sup>2</sup> There was a lot of mobility on the individual level, especially from individualism to cooperation and from competition to individualism. Mobility from cooperation to other types was lower than mobility from individualism and competition. The Chi Square statistic is significant (47.81,  $df=9$ ,  $p<.000$ ), but the Spearman rank correlation is only .141 ( $p<.000$ ). The correlation between the altruism parameters of 1994 and 1995 is .203. When the inconsistent respondents were left out of the analysis (see lower part of table 3), 58.8% had stable social value orientations, increasing the rank correlation to .255 ( $p<.000$ ); the Chi Square is 43.20 ( $df=4$ ,  $p<.000$ ). One could argue that the high number of inconsistent patterns in 1995 is due to the difference in instruction. The reminder 'that the other is an unknown other', added in 1995, may have increased the number of inconsistent patterns. However, panel A of table 3 shows that the respondents with inconsistent patterns in 1995 were not drawn systematically from a specific type in 1994. About 20% of all three types changed their allocation rule into an inconsistent pattern. There is no evidence that the difference in instruction affected one type of respondents more than another. Furthermore, it is unclear how and why adding the reminder would have increased the mobility between consistent types.

Table 3 about here

It is possible that the low correlation between the social value orientation in 1994 and 1995 is the result of random errors in the items used, and does not reflect the true stability of the underlying latent trait. To account for measurement unreliability inherent in the decomposed games, a structural equation model (Jöreskog & Sörbom, 1993) is presented that takes account of measurement errors in the separate games.

Structural equation modelling requires continuous variables. To meet this requirement, the continuous variables reflecting the proportion of points in the games given away to the other were used instead of the discrete types (cooperative, individualistic, and competitive). The correlation matrix (see appendix, table C) of the proportions given away to the other in the six games in 1994 and 1995 was used as input. In the basic model, the error terms

between games 1 and 4, 2 and 5 and 3 and 6 were allowed to be correlated (both in 1994 and 1995), because the order of cooperative, individualist and competitive responses was the same in these pairs. The basic model had an unacceptable high Chi-square statistic of 126.30 ( $df=47$ ,  $p<.000$ ). An inspection of the residuals showed that the errors of games 2 and 6, 4 and 6, 5 and 6 and 4 and 5 in 1994 and games 1 and 3, and 2 and 6 in 1995 were correlated. Further reductions of the Chi square were obtained by setting the errors of games 1, 4 and 5 and 2 and 4 in 1994 and games 4 and 5 and 3 and 6 in 1995 equal. The final model is presented in figure 1. Although the Chi square of the final model was still marginally significant ( $\chi=60.01$ ,  $df=46$ ,  $p<.080$ ), the model had a good fit (RMSEA=0.019; GFI=0.99).

Figure 1 about here

The measurement errors in the separate games are relatively small in 1994 (ranging from .16 to .22), and were somewhat higher in 1995 (ranging from .28 to .42 in 1995). Correcting for measurement error, the stability coefficient is .22. This value is hardly different from the bivariate correlation between the altruism parameters (which was .20) because the measurement errors are so small. This could be seen already from the high Cronbach's alpha-coefficients. Although the value of .22 is significantly different from zero at the  $p<.000$  level, it is very low for a measurement instrument that is assumed to measure more or less stable individual differences in prosocial motivation. Longitudinal analyses of personality traits over much longer periods of time show much higher levels of stability (Ardelt, 2000). The combination of low reliability with small measurement errors indicates that the respondents gave very consistent, but very different answers in 1995 than in 1994.

The results of separate analyses for different age groups (see table 4) show that the stability coefficients indeed vary with age: for respondents younger than 30, the coefficient was .12; for respondents between 30 and 50 years of age it was .28, and for respondents older than 50 it was .18. Although the stability-coefficients varied with age, as in research on established personality measures, the maximum level of stability (.28 in the middle-aged group of 30-50 year olds) is still low. It can be concluded that prosocial motives in social dilemma situations are subject to considerable change over time, and even more so for persons under 30 and for persons over 50 years of age.

Table 4 about here

## *Discussion*

The low longitudinal stability of social value orientations can be explained in at least three ways. A first methodological possibility is that something is wrong with the data. An analysis of panel attrition was performed to find systematic biases in retention rates. However, this analysis showed that panel attrition was not selective with regard to social value orientation.

A second, substantial explanation is that social value orientations change throughout the life course. Previous research (Van Lange et al., 1997) has shown that the proportion of cooperative respondents increases most strongly from 15 to 29 years of age. In this age period, many adolescents start to cohabitate, marry and/or have children. The stability was lowest for this age group (.12). Future research should investigate to what extent changes in social value orientations are related to changes in the life course, such as transitions from adolescence to adulthood. However, it is unlikely that life course transitions explain the relatively high rate of mobility (57.5%) in the relatively short period (19 months) investigated in this article. Only six respondents who did not have a partner in May 1994 indicated they had a partner in December 1995, while for 12 respondents the reverse pattern was found. Furthermore, differences between age groups can also reflect cohort differences (Van Lange et al., 1997). Recent research has shown that cohort differences in religious socialization explain age differences in prosocial value orientations: older persons grew up in more religious environments, where altruistic behavior is more strongly rewarded (Bekkers, 2003).

A third possibility is that the measurement procedure of social value orientations is vulnerable to situational disturbances. The decomposed games that are used to measure social value orientations are abstract and hypothetical dilemmas. They instruct the respondent to imagine herself in a rather artificial and 'weak situation': the context provides no clues on the desirability of the alternatives. Although weak situations may be excellent for detecting individual differences (Snyder & Ickes, 1985), research on priming (Hertel, & Fiedler, 1998; Utz, Bovina, Green, & Waldzus, 1999) suggests that the classification of a respondent in one of the types of social value orientations can be changed by very subtle influences such as the kind of words used in an unrelated language task prior to the social value orientations measure. However, in previous research using university students as participants, priming effects were only observed for respondents who had inconsistent value orientations in a pretest. In the present study, respondents of all types of value orientations exhibited similar mobility rates to other types. Priming can only explain the low stability if its effects were so

powerful that they also affected respondents with consistently individualistic or competitive social values in 1994. Although this seems unlikely, it is a real possibility. The respondents were part of a pool of respondents representing the Dutch population that was being polled weekly on a broad variety of topics. The measurement of social value orientations may have been disturbed by the questions in previous surveys. Unfortunately, it was impossible to track what kind of surveys the respondents completed before the measures of social value orientations were taken because the data from other questionnaires completed by the respondents were not accessible.<sup>3</sup> Therefore, a second study was conducted, in which the context in which measures of social value orientations were taken was varied systematically.

## Study 2

### The Frame of the Game: priming effects on social value orientation

The present study investigated the validity of social value orientations measured with decomposed games by comparing the proportion of prosocial respondents in an assessment that was part of the 'Giving in the Netherlands'-survey on charitable giving (the 'during survey'-condition) with the proportion in a control group, in which social value orientations were assessed prior to the same survey (the 'prior to survey'-condition). The validity of measures of social value orientation is expected to be lower in the 'during survey'-condition. Hertel & Fiedler (1999) showed that students who make inconsistent choices in a first series of decomposed games can be 'changed' into prosocials in a second series after priming them with prosocial words in a seemingly unrelated crossword puzzle. However, the results of study 1 suggested that the effects of priming may also become visible among persons with consistent social values.<sup>4</sup>

The extensive questionnaire on charitable donations (for a description see Schuyt, 2003) may give the respondents the impression that giving to charitable causes is the 'right thing to do'. The questionnaire asked whether the respondents had made donations to a variety of causes in a variety of ways in the previous year. These questions are likely to prime a prosocial frame of mind. Respondents who have first reported honestly that they have not been very generous may then be tempted to exaggerate their hypothetical generosity in a decomposed game when there are no real stakes involved. Thus, the social value orientations of the respondents who completed the decomposed games *after* a series of questions on their charitable donations will be more prosocial and less often inconsistent, competitive and individualistic than the social value orientations of the respondents who completed the decomposed games measure prior to the survey.

#### *Method*

##### *Participants, design and procedure*

To investigate whether choices in decomposed games are affected by previous questions in a survey, an experiment was conducted with the first wave of the "Giving in the Netherlands" Panel Survey (GINPS), collected in May 2002 (Schuyt, 2003). The survey was completed by a random sample of 1,707 respondents from the Dutch population and an additional sample of 257 respondents from Protestant denominations, which was included for

reasons not pertinent to the present study (Bekkers & Schuyt, 2004). The total number of observations is 1,964. These respondents were drawn from a pool of 72,000 respondents who regularly participate in surveys through the Internet. In drawing the sample, special care was taken to avoid sample bias with regard to Internet use by stratification of the sample with regard to age, gender, and geographic region. Data for the present study were collected through the Internet.

The survey questionnaire software randomly created two groups: half of the respondents completed the social value orientation procedure before they answered the questions on charitable giving; and the other half completed the social value orientation procedure as part of a series of questions on motives for charitable giving, which were asked after the questions on actual donations (see figure 2). Social value orientations were measured with the same nine decomposed games as in study 1, and based on these choices, an altruism parameter was computed to obtain a linear measure.

### *Results and discussion*

Table 5 shows the results of the experiment. The distribution of types was statistically different in the two conditions (Chi Square (df=3)=68.91,  $p < .000$ ). As expected, the proportion of respondents with a cooperative social value orientation was markedly higher in the during survey condition, while the proportion of competitors and individualists was lower. In contrast to the results obtained by Hertel & Fiedler (1998), the proportion of inconsistent respondents in the two conditions was similar.

In the during survey condition, the average proportion of points allocated to the unknown other 42.24% (vs. 38.05% in the prior to survey condition; F-value in Anova = 76.73,  $p < .000$ ).

Table 5 about here

A reliability analysis of the altruism parameters showed that the larger number of cooperative respondents in the during survey-condition was not due to larger measurement errors in the during survey-condition (for correlations, see table D in the appendix). In both conditions, Cronbach's alpha was very high: .97.

### **Study 3**

#### **Predictive validity of social value orientations**

The present study investigates the predictive validity of social value orientations. Previous studies reported that social value orientations are related to cooperation in abstract social dilemma games (e.g., Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988; Van Lange, 1991; Buckley et al., 2001; Takács, 2002). However, Ligthart (1995), Parks (1994) and Snijders (1996) obtained no relations of social value orientation with cooperative behaviors in experimental social dilemmas. In less abstract decision situations, social value orientations have been found to be related to a cooperative style of negotiation behavior in the laboratory (De Dreu & Van Lange, 1995) as well as in the real world (Nauta, De Dreu & Van der Vaart, 2002), to helping behavior (McClintock & Allison, 1989), and environmental decision making (Van Vugt, Meertens & Van Lange, 1995; Cameron, Brown & Chapman, 1998). In each of these studies, participants classified as cooperative were more likely to make more prosocial choices than those classified as individualists. However, all of these studies investigated behaviors with low costs and almost all (except Nauta, De Dreu & Van der Vaart, 2002) used homogenous college samples, and investigated behavior in the laboratory (except Nauta et al, 2002 and McClintock & Allison, 1989). From a skeptical point of view, these studies merely show that general intentions to cooperate are positively related to specific types of cooperative choices in laboratory experiments.

The present study presents a stronger test of the external validity of social value orientations than previous studies, by concentrating on 'real life' examples of prosocial behavior, which require substantial investments of time and money, reflecting an ongoing commitment to public goods. If different types of social value orientations represent different degrees of concern for collective outcomes, they should predict prosocial behavior fostering collective welfare in the 'real life', such as donations to charitable causes. While social value orientations are measured by having respondents allocate a hypothetical endowment to a hypothetical, unknown other, charitable donations are allocations of real, earned wealth to real, but usually anonymous others. Another obvious criterion variable for the external validity of social value orientation is volunteering behavior: the allocation of labor to the benefit of some group or cause without monetary compensation. Although volunteering should not be equated with altruism because there are many potential egoistic motives for

volunteering (Smith, 1981; Clary et al., 1998), some volunteering may be inspired by altruistic motives.

This study uses data from the same survey as the previous study, which allows for a test of the hypothesis that priming effects on social value orientation compromise external validity. Because the ‘prosocial’ category in the during survey condition is likely to contain persons who are not generous in real life, the predictive power of social value orientation for prosocial behavior in the real life will be lower in the during survey condition.

## *Method*

### *Participants, design, and procedure*

Study 2 provides a discussion of the participants and design of the present study. To measure charitable donations, respondents were first given a list of 24 different methods that they may have used to give to charitable causes (e.g., in response to a request through direct-mail, in a door to door collection, fundraising in church). Respondents indicated whether they had donated any money through each of these methods. Previous research (Rooney, Steinberg & Schervish, 2001) suggests that the method-cues help respondents to remember their gifts more accurately. Then the respondents were given an ‘Area’ list of 10 different types of charitable causes (church or other religious causes, health, international charities, environment and wildlife, education and research, culture and the arts, sports and hobby clubs, social benefit, and other nonprofit organizations), for each of which the respondents indicated whether they had given anything and if so, how much. From the method and area cues, our dependent variables were constructed. A positive response to any of the method or area cues served as a measure of the incidence of charitable giving: whether any gifts were made to charitable causes in the preceding year. Among those who reported gifts, a natural log transformation of the total amount donated was applied to obtain an approximately normal distribution.

The GINPS also contained a survey module on volunteering, which also used a Method-Area approach. First, the respondents indicated whether they had performed any of 13 different types of unpaid work on behalf of a voluntary association in the past year. Then the respondents indicated whether they been involved as a volunteer with any voluntary associations in 14 different areas (sports and hobby clubs, health, social or legal assistance, school or other educational institution, culture and the arts, community, neighborhood, environment and wildlife, politics, union or professional organization, international charities,

religion, immigrant, or other association) in the past year. We considered respondents who indicated at least one type of volunteer activity for at least one type of nonprofit association as volunteers.

Two series of regressions (maximum likelihood probit regressions of volunteering activity and charitable giving in the past year, and an ordinary least squares regression of the transformed amount donated among donors) were run using the four types of social value orientations as dichotomous predictors, one for each measurement condition, and the proportions of variance explained in these conditions were compared. This procedure was repeated using the altruism parameter as a predictor instead of the fourfold typology. It was expected that persons with cooperative social value orientations would report the highest incidence of volunteering and charitable giving as well as the highest amounts donated, with individualists reporting lower levels of prosocial behavior and competitors the lowest levels.

### *Results*

Table 6 shows how social value orientations are related to giving and volunteering behavior as a function of measurement condition. None of the differences in criterion variables between the two measurement conditions are significant at the  $p < .010$  level, ensuring that differences are not due to sampling differences or under- or overreporting in the two conditions. Table 7 shows the proportion of variance in the criterion variables explained by social value orientations in the regression analyses. The results in tables 6 and 7 indicate that social value orientations are related to prosocial behavior outside the laboratory, but that the predictive validity is seriously endangered when social value orientations are measured after the criterion variables. Table 6 shows that respondents with cooperative social value orientations are more often engaged in unpaid work for voluntary associations than the other types of respondents, especially competitors, and donate higher amounts of money to charities. The differences in between the four types of social value orientations are more pronounced in the prior to survey condition. Social value orientations are not related to the incidence of charitable donations in either of the two conditions. Although the order of the proportions of respondents reporting donations for the four types follows the pattern observed for the other two criterion variables, the differences are not significant. Table 7 shows that the proportion of variance in prosocial behavior explained by social value orientations is about twice as high in the prior to survey condition. Still, the proportion of variance explained by social value orientation is low. Social value orientations show the strongest relation with the

amount donated to charities, but only 3.93% of the variance in this criterion variable is explained by social value orientations (in the prior to survey condition). To compare, when age and church attendance are added to the model, the proportion of explained variance increases to 31%.

### *Conclusion and Discussion*

The results of the present study indicate that social value orientations measured with decomposed games have some predictive validity for prosocial behavior in the real life. As expected, persons with cooperative social value orientations and with higher altruism parameters were more likely to volunteer than persons with competitive and individualistic social values who have lower altruism parameters. However, the predictive value of social value orientations was small, and substantially lower – about half, in terms of explained variance – in the during survey condition than in the prior to survey condition (explaining at maximum 3.93% and 1.80% of the variance in criterion variables in the two respective conditions). Measuring social value orientations after relevant criterion variables such as measures of volunteering activity or charitable donations did not only change the classification of respondents, but also compromises the external (or ‘ecological’) validity of the classification. When social value orientations are measured after the criterion variables, the predictive value of decomposed games is low. This may be the reason why some previous studies have not found significant relations of social value orientations with prosocial behavior (Snijders, 1996; Snijders & Weesie, 1999). However, this does not hold for all studies which failed to find relations of social value orientations with prosocial behavior (e.g., Parks, 1994). Buckley et al. (2001) found that social value orientations measured with negative instead of positive amounts in the decomposed games are not related to cooperation in a social dilemma game. The present study shows that placement of the decomposed games after the criterion variables is another factor that limits the predictive value of social value orientations – which are relatively weak to begin with, compared with some key socio-demographic characteristics.

## General Discussion

This paper investigated three psychometric properties of social value orientations: stability, reliability, and validity. Study 1 showed that the reliability of the measure is very high, but that the longitudinal stability of social value orientations was low over a period of 19 months: only 44.8% of the respondents had stable social value orientations. A structural equation model corrected for the disturbing effect of measurement error, producing a stability coefficient of only .22. Consistent with research on the stability of personality characteristics, stability coefficients varied with age: social value orientations were least stable for persons under 30 (.12), somewhat higher for persons over 50 (.18), and most stable for people aged 30-50 (.28). However, in absolute terms it is still low for the most stable age group.

Study 2 explored the possibility that the low stability could be due to the measurement of social value orientation amidst other survey questions with a survey experiment among a large sample of the Dutch population (n=1,964). As expected, the proportion of cooperative respondents was higher and the proportion of individualistic and competitive respondents was lower when social value orientation were assessed after a series of questions on charitable giving and motives for charitable donations. Together, the results of study 1 and 2 suggest that the stability of social value orientations is affected by the timing of the measurement procedure. A replication of study 1 using the experimental design of study 2 is advised to investigate this possibility more fully. Such a replication can be done with an assessment of social value orientation in a next edition of the 'Giving in the Netherlands'-survey. If the suggestion is correct that the stability of social value orientations is underestimated when the assessment takes place during the survey, the stability of social value orientations across two prior to survey-assessments should be higher than the .22 reported in study 1.

Study 3 showed that cooperative respondents were consistently more likely to engage in several forms of prosocial behavior than persons with individualistic or competitive social value orientations. Cooperative respondents more often engage in unpaid work for voluntary associations, and give higher amounts of money to charitable causes. Differences between persons with more and less social value orientations were more pronounced when social value orientations were measured before the criterion variables. However, the effect size of social value orientations was small, compared to socio-demographic characteristics such as age and the frequency of church attendance.

In sum, the results of this paper show that social value orientations can be used as a measure of prosocial motives in social dilemmas and have some predictive validity for prosocial behavior outside the lab, especially if they are assessed in a pretest. The measurement of social value orientations within a survey that is used to obtain measures of prosocial behavior should be done with great care, making sure that social value orientations are measured before the criterion variables. When measured carefully, decomposed games can be used to uncover other regarding preferences that may explain other regarding behavior. Further refinement of the measurement procedure for social value orientations is required to be able to distinguish the equality or fairness motive from altruistic motivations to benefit others. In the set of decomposed games that has become the standard in social psychological studies (Van Lange et al., 1997), the cooperative type combines these two motives, while they may have distinct effects on prosocial behavior (Van Lange, 1999).

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## Notes

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1. Gintis (2001) has argued that typological thinking is typical for psychologists, while economists would think more in linear terms. Note that Gintis is an economist.

2. The 59% with consistent orientations reported by Van Lange (1999) ignores inconsistent respondents.

3. In addition, the use of a random sample of the Dutch population may have increased the priming effect. It seems logical that university students are less likely to behave inconsistently in an abstract decision making task such as the decomposed games than persons who did not finish elementary school. A logistic regression analysis (results available from the author) shows that the likelihood of having a consistent value orientation increases with the level of education, and decreases with age.

4. Sawyer (1966) showed that imagining the other being a friend drastically changes the classification of respondents – making people more prosocial. Three decades later, Ligthart (1995) did the same. In the present study, the respondents were thinking that the other in the decomposed games was an ‘unknown other’, but the respondents in the during survey condition had first recollected their donations to charitable causes while the respondents in the prior to survey condition had not.

*Table 1. Distribution of social value orientations and mean altruism parameters in 1994 (n=1728)*

Social value orientation	N	%	% of consistent respondents (n=1593)	Mean altruism parameter (Std)
Cooperative	1134	65.6	71.2	49.81 (0.91)
Individualistic	340	19.7	21.3	36.04 (1.17)
Competitive	119	6.9	7.5	17.42 (1.65)
Inconsistent	135	7.8	----	36.06 (7.12)

*Table 2. Distribution of social value orientations and mean altruism parameters in 1995 (n=2360)*

Social value orientation	N	%	% of consistent respondents (n=1851)	Mean altruism parameter (Std)
Cooperative	1057	44.8	57.1	49.39 (1.45)
Individualistic	583	24.7	31.5	36.14 (1.22)
Competitive	211	8.9	11.4	17.24 (1.60)
Inconsistent	509	21.6	----	36.70 (6.39)

Table 3. Social value orientations in 1994 and 1995 (Van Lange et al., 1997, n=805)

PANEL A		SVO1995									
		Cooperative		Individualist		Competitive		Inconsistent		N	
SVO 1994	Cooperative	273	51.0%	110	20.6%	34	6.4%	118	22.1%	535	66.5%
	Individualist	51	32.9%	59	38.1%	15	9.7%	30	19.4%	155	19.3%
	Competitive	11	22.9%	18	37.5%	10	20.8%	9	18.8%	48	6.0%
	Inconsistent	24	35.8%	17	25.4%	7	10.4%	19	28.4%	67	8.3%
N		359	44.6%	204	25.3%	66	8.2%	176	21.9%	805	

PANEL B		SVO1995									
		Cooperative		Individualist		Competitive				N	
SVO 1994	Cooperative	273	65.5%	110	26.4%	34	8.2%			417	71.8%
	Individualist	51	40.5%	59	47.2%	15	12.0%			125	21.5%
	Competitive	11	28.2%	18	46.2%	10	25.6%			39	6.7%
N		335	57.1%	187	32.4%	59	10.5%			581	

Table 4. Stability coefficients of social value orientations for three age groups

	$\gamma$	N
Younger than 30	.12	74
30 to 50 years old	.28	321
Older than 50	.18	372
All	.22	805

Numbers of observations do not add up to 805 because of missing values on age

*Table 5. Distribution of social value orientations with two different moments of measurement*

	Incon- sistent	Competi- tive	Indivi- dualist	Coopera- tive	Altruism parameter
Prior to survey (n=995)	10.35%	18.19%	30.55%	40.90%	38.05
During survey (n=969)	9.39%	8.36%	24.87%	57.38%	42.24
Chi Square	<sup>a</sup> 0.51	<sup>a</sup> 41.05 ***	<sup>a</sup> 7.90 **	<sup>a</sup> 53.31 ***	<sup>b</sup> 76.73 ***

\*\*\* p<.001; \*\* p<.01; \* p<.05; (\*) p<.010

<sup>a</sup> Chi Squares are computed separately for each type of social value orientation.

<sup>b</sup> F-value in Anova (df=1)

*Table 6. Means for charitable giving and volunteering by type of social value orientation by moment of measurement*

<i>Made donation</i>	Inconsistent	Competitive	Individualist	Cooperative	All
Prior to survey	77.67%	79.56%	83.22%	83.78%	82.21%
During survey	83.52%	83.95%	85.48%	82.55%	83.49%
<i>Amount donated</i>					
Prior to survey	€187.03	€162.09	€168.61	€340.65	€239.71
During survey	€348.14	€166.91	€224.80	€294.23	€271.38
<i>Volunteered</i>					
Prior to survey	39.81%	37.02%	42.11%	54.79%	46.13%
During survey	41.76%	40.74%	39.83%	51.98%	47.06%

Table 7. Effects of social value orientations on charitable giving and volunteering by moment of measurement and measure of social value orientations

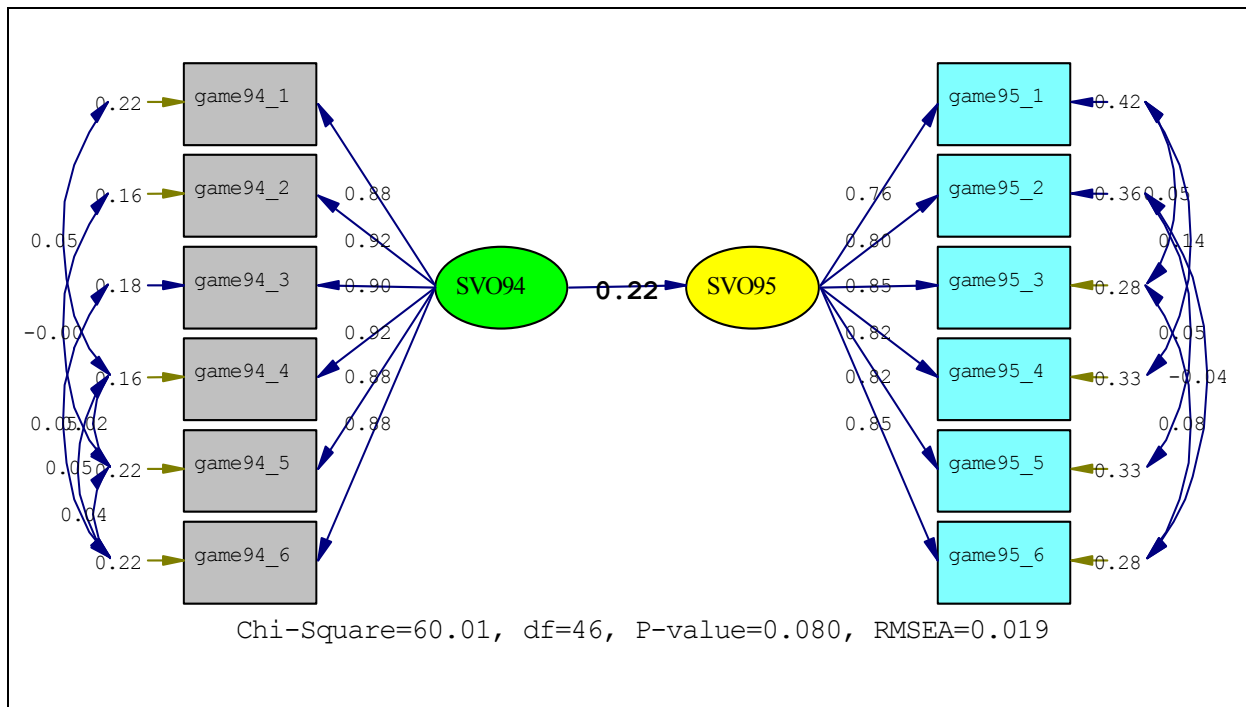
Measure of social value orientations						
	Types of social value orientations			Altruism parameter		
<i>Made donation</i>	<sup>a</sup> Chi Square		R Square	<sup>a</sup> Chi Square		R Square
Prior to survey	3.13		.0034	2.52		.0027
During survey	1.07		.0012	0.04		.0001
<i>Amount donated (ln)</i>	<sup>b</sup> F-value			<sup>b</sup> F-value		
Prior to survey	12.13	***	.0393	26.02	***	.0297
During survey	5.94	**	.0180	11.84	***	.0132
<i>Volunteered</i>	<sup>a</sup> Chi Square			<sup>a</sup> Chi Square		
Prior to survey	22.05	***	.0161	17.98	***	.0131
During survey	12.83	**	.0096	10.44	**	.0078

\*\*\* p<.001; \*\* p<.01; \* p<.05; (\*) p<.010; --- Not applicable

<sup>a</sup> Chi Squares are computed for the 2 (criterion variable) x 4 (type of social value orientation) tables

<sup>b</sup> F-value in Anova (df=1)

Figure 1. Structural equation model of stability of social value orientation



*Figure 2. Placement of measurement procedure for social value orientation in the GIN01-survey*

Condition		GIN-questionnaire	N
Prior to survey	Social value orientation	Donations Motives	995
During survey		Donations Motives Social value orientation	969

## Appendix

Table A. Introduction to the measurement of social value orientation

In this short questionnaire we ask you to make a number of choices. You make choices by means of circling letters A, B or C. Your choices determine the number of points that you and somebody else receive. Assume that *this other person also makes choices* in exactly the same task.

*Who is this other person?*

Assume that the other person is somebody that you do not know (have never met) and that you will never meet this person in the future. The other person is completely unknown to you.

*What do points mean?*

Points represent the things you value. Assume that every point is valuable to you. The more points you get, the better for you. The same is true for the other: the more points he or she gets, the better for him or her.

An example:

	A	B	C
You get	550	500	500
The other gets	300	500	100

This example works as follows. If you choose A, you will get 500 points, and the other will get 100 points; if you choose B you will get 500 points and the other will get 500 points; if you choose C you will get 550 points and the other gets 300 points.

*Table B. Self-other outcome distributions and corresponding altruism-parameters*

Game		Pay-offs for		Sum	Altruism-parameter (other/sum-ratio)
		self	other		
1	A	480	80	560	14,3
	B	540	280	820	34,1
	C	480	480	960	50,0
2	A	560	300	860	34,9
	B	500	500	1000	50,0
	C	500	100	600	16,7
3	A	520	520	1040	50,0
	B	520	120	640	18,8
	C	580	320	900	35,6
4	A	500	100	600	16,7
	B	560	300	860	34,9
	C	490	490	980	50,0
5	A	560	360	860	41,9
	B	500	500	1000	50,0
	C	490	90	580	15,5
6	A	500	500	1000	50,0
	B	500	100	600	16,7
	C	570	300	870	34,5
7	A	510	510	1020	50,0
	B	560	300	860	34,9
	C	510	110	620	17,7
8	A	550	300	850	35,3
	B	500	100	600	16,7
	C	500	500	1000	50,0
9	A	480	100	580	17,2
	B	490	490	980	50,0
	C	540	300	840	35,7

*Table C. Correlations among altruism parameters in the 6 decomposed games in 1994 and 1995*

1994	MAY 1994						DECEMBER 1995						
	1	2	3	4	5	6	1	2	3	4	5	6	
1	1.000												
2	.822	1.000											
3	.808	.840	1.000										
4	.876	.845	.842	1.000									
5	.778	.832	.814	.821	1.000								
6	.812	.836	.875	.866	.838	1.000							
1995_1	.151	.159	.136	.154	.146	.205	1.000						
2	.189	.185	.177	.204	.167	.166	.605	1.000					
3	.143	.148	.131	.173	.134	.147	.698	.680	1.000				
4	.117	.161	.130	.146	.122	.176	.763	.652	.698	1.000			
5	.126	.152	.146	.171	.148	.223	.628	.702	.694	.673	1.000		
6	.163	.172	.169	.183	.178	.175	.648	.640	.798	.696	.697	1.000	

*Table D. Correlations among altruism parameters in the 9 decomposed games in the two experimental conditions in GIN01*

2001		PRIOR TO SURVEY (N=995)								
GAME		1	2	3	4	5	6	7	8	9
DURING SURVEY (N=969)	1	---	.670	.719	.792	.708	.696	.734	.743	.761
	2	.682	---	.757	.754	.763	.743	.784	.755	.765
	3	.655	.723	---	.788	.782	.835	.841	.824	.786
	4	.754	.764	.782	---	.806	.792	.823	.833	.826
	5	.629	.740	.754	.767	---	.783	.845	.812	.827
	6	.685	.724	.828	.800	.756	---	.867	.869	.794
	7	.689	.780	.804	.798	.736	.879	---	.868	.843
	8	.698	.686	.813	.808	.776	.862	.853	---	.841
	9	.690	.739	.735	.823	.781	.770	.834	.792	---

# **Stability, reliability and validity of social value orientation**

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