



Universiteit
Leiden
The Netherlands

Uncertainty in social dilemmas

Kwaadsteniet, E.W. de

Citation

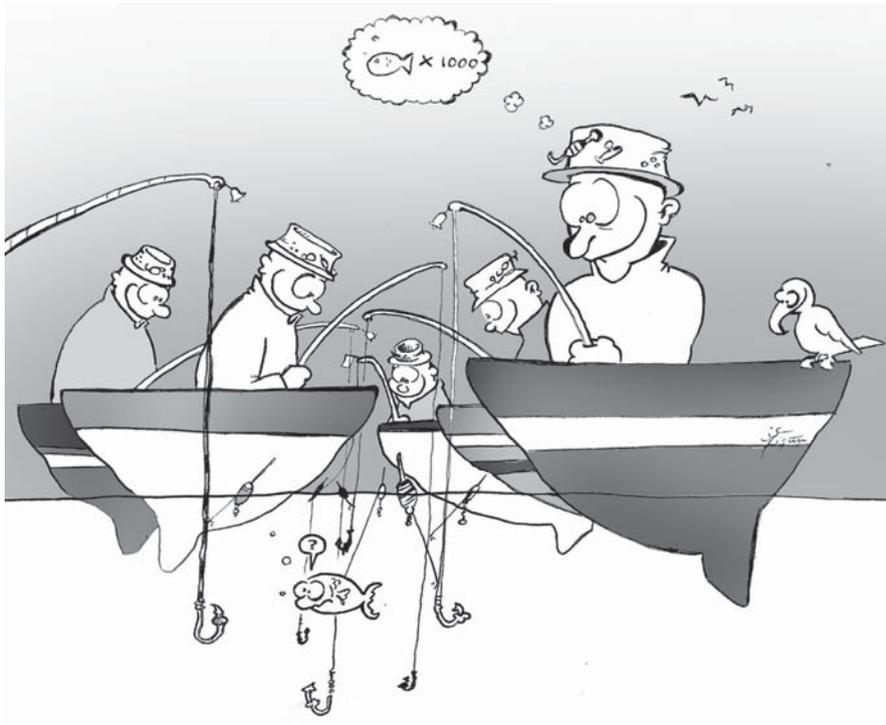
Kwaadsteniet, E. W. de. (2007, October 9). *Uncertainty in social dilemmas. Kurt Lewin Institute Dissertation Series*. Ridderprint. Retrieved from <https://hdl.handle.net/1887/12369>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/12369>

Note: To cite this publication please use the final published version (if applicable).



Over-harvesting and overestimation of the common resource

Chapter 2

Social Dilemmas as Strong versus Weak Situations⁴

Social dilemmas are situations in which people are faced with a conflict between furthering their personal interests (called *defection*) and furthering the interests of their group (called *cooperation*). In such dilemmas, a choice to defect yields the best pay-off to individual group members in at least one of the possible outcome-configurations, whereas all individual group members are better off if all cooperate than if all defect (Liebrand & Messick, 1996; see Komorita & Parks, 1995; Kopelman, Weber, & Messick, 2002, for reviews).

A well-known type of social dilemma is the *common resource dilemma* (also referred to as commons dilemma). This dilemma refers to the problem of maintaining scarce common resources. A real-life example is the world-wide social dilemma of energy consumption. Whereas the collective interest calls for moderate energy consumption, personal interests may lead to excessive usage. On a smaller scale, an example of the energy consumption dilemma is the problem of electrical blackouts. Such blackouts occur when the electricity grid is overloaded because the demand for electricity is higher than the available supply. As long as the collective use does not exceed a certain threshold, the use of electricity is beneficial to people's personal interests. However, if this threshold is exceeded, the electricity grid breaks down and both collective and personal interests are harmed.

Experimental studies on common resource dilemmas are designed to capture the primary elements of the interdependence structure described above (e.g., Budescu, Rapoport, & Suleiman, 1990; Gustafsson, Biel, & Gärling, 1999a; Rapoport, Budescu, Suleiman, & Weg, 1992). In a typical experiment, participants are collectively endowed with a resource of money or chips from which each group member can request an amount. As long as the total group request does not exceed the resource size, all individual requests are granted. If the collective request, however, exceeds the amount available in the common resource, the resource becomes depleted and all group members receive zero outcomes. It is thus in the interest of each individual group member as well as in the interest of the group that the total group request does not exceed the size of the common resource.

Therefore, in common resource dilemmas, it is important for people to coordinate their choice behavior efficiently (i.e., by not over-using the common resource).

⁴ This chapter is based on De Kwaadsteniet, Van Dijk, Wit and De Cremer (2006).

In order to do so, people may use their expectations of what their fellow group members will decide. However, in most social dilemma situations, people cannot communicate with one another and therefore they are uncertain about the decisions of their fellow group members. To deal with this *social uncertainty* (Messick, Allison, & Samuelson, 1988), people use so-called tacit coordination rules to make inferences about their group members' choice behavior (Van Dijk & Wilke, 1996). Moreover, people use such coordination rules as *focal points* for their own choice behavior (Schelling, 1960).

Tacit Coordination in Common Resource Dilemmas

Which coordination rule is most often applied in common resource dilemmas? Earlier research (e.g., Allison, McQueen, & Schaerfl, 1992; Allison & Messick, 1990; De Cremer, 2003; Rutte, Wilke, & Messick, 1987; Van Dijk & Wilke, 1993, 1995; Van Dijk, Wilke, Wilke, & Metman, 1999) has shown that in *symmetric* common resource dilemmas (i.e., all group members have equal access to the common resource), most people request an equal share of the common resource. For instance, in the experimental set-up we described earlier, when a common resource contains 500 coins and is owned by a group of five group members, participants will often decide to request one-fifth of that resource, namely 100 coins. In other words, in this kind of social dilemma, group members anchor their choice behavior on the *equal division rule* (Allison et al., 1992; Samuelson & Allison, 1994). Note that this logic only applies to social dilemma situations with a coordination point in which individual and collective interests converge (which is the case in almost all experiments on environmental uncertainty; see e.g., Budescu et al., 1990; Gustafsson et al., 1999a; Rapoport et al., 1992). In such situations, when all group members adhere to the equal division rule the resource is optimally used and a perfect balance between personal and collective interests is realized.

Furthermore, to employ the equal division rule, the size of the common resource has to be common knowledge to all group members. In order to deal with social uncertainty, people need specific and exact information about the task environment of the social dilemma. Many real-life common resource dilemmas, however, do not provide such environmental information. In the blackout example, for instance, it is very unlikely that people know with certainty how large the available supply of electricity is. What do people base their decisions on under such *environmental uncertainty* (i.e., uncertainty about characteristics of the task environment of a social dilemma; Messick et al., 1988)? One possible answer to this question may be provided by looking at social dilemmas with environmental certainty as "strong" situations versus looking at social dilemmas with environmental uncertainty as "weak" situations.

Social Dilemmas as Strong Versus Weak Situations

According to Snyder and Ickes (1985), an environment can create either a

psychologically “strong” or a psychologically “weak” situation. Strong situations have a high degree of structure and definition and therefore provide salient cues for behavior. Weak situations, by contrast, do not offer such cues for behavior because they are relatively unstructured and ambiguous. In strong situations, behavior is thus largely guided by the constraints of the situation, resulting in little interpersonal differences in people’s responses. In weak situations, on the other hand, behavior is more strongly influenced by dispositional factors, resulting in more interpersonal variation.

Van Lange (1997; see also Roch & Samuelson, 1997) has suggested that this strong-weak distinction is also applicable to social dilemma situations. If we apply this perspective to environmental uncertainty, we can define the typical experimental common resource dilemma as a strong situation as it provides participants with the clear focal point that applying the equal division rule is the most “appropriate” way to behave. By contrast, a common resource dilemma in which the size of the resource is uncertain does not provide such a clear focal point to guide behavior. As a result, the equal division rule may lose its coordinating potential. In such situations, we suggest that participants will rely more on relevant internal cues such as their dispositional preferences for engaging in either cooperation or non-cooperation. Therefore, we suggest that in common resource dilemmas with environmental uncertainty, participants use their own social value orientations as a guideline for choice behavior.

Social Value Orientations

Social value orientation (SVO) is a personality variable that indicates how people evaluate outcomes for themselves and others (Messick & McClintock, 1968; Van Lange & Liebrand, 1991). Generally, a distinction is made between three types of social value orientations (e.g., Van Lange, 1999): (a) cooperation, i.e., the preference to maximize joint outcomes and establish an equal distribution, (b) individualism, i.e., the preference to maximize own outcomes, and (c) competition, i.e., the preference to maximize the relative advantage of own outcomes. Cooperators are commonly referred to as prosocials, and individualists and competitors as proselfs (e.g., Kramer, McClintock, & Messick, 1986; McClintock & Liebrand, 1988; Van Lange & Kuhlman, 1994). In social dilemmas, prosocials generally show more cooperative behavior than proselfs (e.g., Kramer et al., 1986; Liebrand & Van Run, 1985).

However, as we have argued before, whether proselfs and prosocials behave differently in social dilemma situations may depend on the environmental characteristics of the dilemma (cf. Parks, 1994; Roch & Samuelson, 1997). In the typical common resource dilemma, it is beneficial to both proselfs and prosocials to request an equal share of the resource because it furthers personal as well as collective interests. From this perspective it is “efficient” as well as “fair” to adhere to the equal division rule, making the rule appealing to both proselfs and prosocials (see De Cremer & Van

Lange, 2001; Stouten, De Cremer, & Van Dijk, 2005; Van Lange, 1999). Consequently, we expect that under environmental certainty, the effect of SVO on individual requests will be constrained by the focal point to adhere to the equal division rule (i.e., in a “strong” social dilemma), whereas SVO will more strongly influence choice behavior under environmental uncertainty (i.e., in a “weak” social dilemma).

Based on the above, we can formulate the following hypotheses. First, we expect to replicate the finding from earlier studies (e.g., Budescu et al., 1990; Gustafsson et al., 1999a; Rapoport et al., 1992), that under resource size uncertainty, people request significantly more than under resource size certainty (Hypothesis 2.1). Second, we predict an interaction between resource size uncertainty and SVO on individual requests. Under resource size certainty, we expect a limited difference between proselfs’ versus prosocials’ individual requests, whereas proselfs are expected to request more than prosocials under resource size uncertainty (Hypothesis 2.2). As in earlier studies on resource size uncertainty in social dilemmas, these hypotheses will be tested by manipulating different levels of resource size uncertainty as a within-subjects factor.

Resource Size Estimates

In the present chapter, we will not focus exclusively on people’s choice behavior. Although not our primary aim, we will also investigate whether resource size uncertainty influences people’s estimates of the size of the resource. In agreement with findings from earlier studies (e.g., Budescu et al., 1990; Gustafsson et al., 1999a; Rapoport et al., 1992), we expect that people will not only increase their individual requests under resource size uncertainty, but also their resource size estimates (Hypothesis 2.3). There are two plausible explanations for these findings (Hine & Gifford, 1996).⁵ One explanation is that people try to justify their non-cooperative behavior by increasing their resource size estimates together with their individual requests. We will refer to this explanation as the *egoism-justification explanation*. A second plausible explanation for this finding is that under environmental uncertainty, people are overoptimistic about the size of the resource and therefore have the tendency to give relatively high estimates. We will refer to this explanation as the *outcome-desirability explanation*.

We will investigate the two above-mentioned explanations in an exploratory manner. Based on the egoism-justification explanation, following the prediction that proselfs request more than prosocials under resource size uncertainty, we can predict that proselfs will also give higher resource size estimates than prosocials. In this way, proselfs may justify their relatively high individual requests. From this perspective, we

⁵ There is a third explanation of this overestimation effect, namely, that there might be a perceptual bias in people’s resource size estimates. However, Gustafsson et al. (1999a, 1999b) have presented results that refute this possibility.

can thus expect that under resource size uncertainty, proselves' resource size estimates will be higher than the estimates of prosocials. The outcome-desirability explanation would not be able to explain such a finding. After all, there is no reason to assume that people with different social value orientations differ in the extent to which they are optimistic about the size of the resource, especially because a large common resource is beneficial to both personal and collective interests. However, in order to check whether SVO is related to optimism, we will also explore whether people with different social value orientations differ in dispositional optimism.

Study 2.1

Method

Participants and Design

Participants were 126 students at Leiden University (42 men and 84 women, M age = 20.98 years) who volunteered for the study. At the beginning of the experiment each participant's SVO was assessed. Subsequently, resource size uncertainty was manipulated as a within-subjects factor. Accordingly, a 2 (SVO: Proselfs vs. Prosocials) \times 3 (Resource Size Uncertainty: No vs. Low vs. High) factorial design was used.

Preliminary inspection of the data showed that the individual request of one proself in the High Resource Uncertainty condition was more than three standard deviations higher than the mean request in this condition, which indicates that this participant was an outlier. Therefore, the data of this participant were excluded from analyses.⁶

Procedure

The participants were invited to participate in a study on "decision making". Upon arrival at the laboratory they were seated in separate cubicles, each containing a personal computer. This computer was used to give instructions to the participants and to register the dependent measures.

Assessment of Social Value Orientation

At the beginning of the experimental session, participants completed the nine-item version of the decomposed games measure to assess their social value orientations (Van Lange, De Bruin, Otten, & Joireman, 1997). The decomposed games measure has excellent psychometric qualities. It is internally consistent (e.g., Parks, 1994), reliable over substantial time periods (Eisenberger, Kuhlman, & Cotterell, 1992), and is not

⁶ Inclusion of this outlier did not alter the pattern of results.

related to measures of social desirability (e.g., Platon, 1994). The task consists of nine items, each containing three alternative outcome distributions with points for oneself and an anonymous other. For each of these nine items the participants had to choose which of the three distributions they preferred. Each item contained a prosocial (e.g., self: 500, other: 500), an individualistic (e.g., self: 560, other: 300), and a competitive choice (e.g., self: 490, other: 90).

Participants were classified as prosocial, individualistic, or competitive when at least six out of nine choices were consistent with one of these three orientations (e.g., Van Lange & Kuhlman, 1994). Out of 126 participants, 56 (44%) were classified as prosocials, 47 (37%) as individualists, and 8 (6%) as competitors. Fifteen participants (12%) could not be classified and were therefore excluded from further analyses. As in many earlier studies (e.g., Kramer, McClintock, & Messick, 1986; McClintock & Liebrand, 1988; Van Lange & Kuhlman, 1994), individualists and competitors were combined to form one group of proselfs ($n = 55$; 44%).

Assessment of Dispositional Optimism

After filling in the decomposed games measure, we asked participants to fill in a revised version of the *Life Orientation Test* (LOT-R), a widely-used scale with good psychometric properties (i.e., good predictive and discriminant validity, high internal consistency and test-retest reliability) that is used to measure dispositional optimism (Scheier, Carver, & Bridges, 1994). After that, participants responded to some filler questionnaires. Next, they were presented with the common resource dilemma.

The Common Resource Dilemma

Participants were informed that they were part of a group of five people, that each group member was sitting in a separate cubicle and that there was no communication possible among participants. Furthermore, participants were not aware of the identity of their fellow group members. Decisions had to be made privately and anonymously.

The participants learned that as a group they would be presented with three situations. These three situations had identical task structures. In each of these situations, each group member could request any number of coins from a common resource. Each coin was worth € 0.01 (€ 1 is approximately US \$ 1.65). For each of the three situations, it held that if the group's collective request would be smaller than or equal to the resource size, the requests would be granted and each group member would earn the amount of money he or she had requested in that situation. However, if the group's collective request would exceed the resource size in a situation, all group members would earn zero outcomes in that situation. During and between the three situations, no feedback was given about the decisions of the other group members nor about the group's collective request.

Manipulation of Resource Size Uncertainty

The three situations only differed in the extent to which there was uncertainty about the size of the common resource. Resource size uncertainty was manipulated by varying the range of the uniform distribution of the resource size (cf. Budescu et al., 1990; Gustafsson et al., 1999a; Rapoport et al., 1992). The midpoint of these ranges was kept constant across the three conditions, namely 500. Under *No Uncertainty*, resource size was certain, namely 500 coins (midpoint = 500, range = 0). Under *Low Uncertainty*, the resource would contain at least 400 and at most 600 coins (midpoint = 500, range = 200). Under *High Uncertainty*, the resource would contain at least 100 and at most 900 coins (midpoint = 500, range = 800). Participants learned that the exact size of the common resource in the two uncertainty conditions would be randomly drawn from these uniform distributions by a computer at the end of the experimental session (i.e., independently for each of the two uncertainty conditions). The three conditions were counter-balanced to check for order effects. Preliminary analyses revealed no significant order effects on any of the dependent variables (all $F_s < 1$).

After the participants read the instructions of the common resource dilemmas, five practice questions were posed to ensure comprehension of the three situations. For example, participants were asked how much group members would earn if the total group request would exceed the size of the common resource in one of the three situations. On average, each question was answered correctly by 97% of all participants. After each question, the correct answer was disclosed and the most important characteristics of the dilemmas were repeated. After that, the three situations were presented.

Dependent Measures

In all three conditions, exactly the same questions were posed. In each condition, participants requested a number of coins from the common resource. Subsequently, they were asked to estimate the size of the common resource.

At the end of the experimental session, which lasted about one hour, all participants were debriefed, thanked and paid for their participation. In the debriefing, we explained participants that we would pay all participants the same amount of money for their participation (i.e., € 7.25, approximately US \$ 12.00). We also explained them that we could not pay them according to their choice behavior because the groups they had been part of did not really exist. All participants agreed to this payment procedure.

Results

Manipulation Checks

Unless stated otherwise, all analyses were performed with 2 (SVO) \times 3 (Resource Size Uncertainty) ANOVAs with repeated measures on the latter factor.

In each of the three conditions, after participants had given their resource size estimates, we asked them to indicate how uncertain they were about these estimates (1 = very certain; 7 = very uncertain). A 2 \times 3 ANOVA on this measure only yielded a highly significant main effect of Resource Size Uncertainty, $F(1.94, 209.54) = 397.28, p < .0001, \eta^2 = .79$ (Huynh-Feldt correction of *dfs*). As expected, participants indicated that they were least uncertain about their estimates under No Uncertainty ($M = 1.26$), more uncertain under Low Uncertainty ($M = 4.64$), and most uncertain under High Uncertainty ($M = 5.50$, all $ps < .05$, HSD). These results show that we were successful in manipulating resource size uncertainty.

Individual Requests

In each of the three conditions, the participants individually requested a number of coins from the common resource. A 2 \times 3 ANOVA on participants' individual requests yielded a significant main effect of Resource Size Uncertainty, $F(1.40, 151.14) = 10.78, p < .001, \eta^2 = .09$, and a significant SVO \times Resource Size Uncertainty interaction effect, $F(1.40, 151.14) = 3.51, p < .05, \eta^2 = .03$ (Greenhouse-Geisser correction of *dfs*). It should be noted, however, that the variances in the High Resource Size Uncertainty conditions were considerably larger than the variances in the No and the Low Resource Size Uncertainty conditions. In order to reduce this heterogeneity of variances, we applied a square root transformation on participants' individual requests. After applying this transformation, which successfully reduced the heterogeneity of variances, a 2 \times 3 ANOVA still yielded the same significant main effect of Resource Size Uncertainty, $F(1.45, 156.24) = 5.52, p < .05, \eta^2 = .05$, and the same significant SVO \times Resource Size Uncertainty interaction effect, $F(1.45, 156.24) = 3.49, p < .05, \eta^2 = .03$ (Huynh-Feldt correction of *dfs*). The main effect of Resource Size Uncertainty indicated that under High Uncertainty participants requested more coins from the common resource ($M = 142.28$) than under No Uncertainty ($M = 109.72$) and under Low Uncertainty ($M = 106.85$). These findings support Hypothesis 2.1, i.e., that under resource size uncertainty people request more than under resource size certainty.

To interpret the interaction effect, we tested whether the individual requests of proselves differed from those of prosocials within each separate level of Resource Size Uncertainty (See Table 2.1). Independent t-tests showed no significant differences between proselves' and prosocials' individual requests under No Uncertainty ($M = 108.50$ vs. 110.89 , respectively), $t(108) = .3, p = .74$, nor under Low Uncertainty

($M = 112.69$ vs. 101.21 , respectively), $t(108) = 1.4$, $p = .16$. Under High Uncertainty, however, proselves requested significantly more coins than prosocials ($M = 163.63$ vs. 121.70 , respectively), $t(108) = 2.1$, $p < .05$. These results support Hypothesis 2.2, i.e., that under resource size uncertainty proselves would request more coins from the common resource than prosocials, although it should be noted that this difference was only significant under High Uncertainty.

Table 2.1. *Individual Requests by Social Value Orientation and Resource Size Uncertainty (2 × 3)*

Social Value Orientation	Resource Size Uncertainty		
	No	Low	High
Proselfs ($n = 54$)	108.50 (35.05)	112.69 (40.51)	163.63 (123.49)
Prosocials ($n = 56$)	110.89 (38.99)	101.21 (43.51)	121.70 (82.95)

Note. Higher scores denote higher individual requests. Standard deviations are given in parentheses.

Resource Size Estimates

After participants had made their individual requests, they were asked to estimate the size of the resource. The No Uncertainty condition was excluded from the analysis of these estimates. After all, in this condition, participants knew the exact size of the common resource with certainty. A 2 (SVO) × 2 (Resource Size Uncertainty: Low vs. High) ANOVA on participants' resource size estimates yielded a significant main effect of Resource Size Uncertainty, $F(1, 108) = 8.73$, $p < .01$, $\eta^2 = .08$, and a significant main effect of SVO, $F(1, 108) = 4.66$, $p < .05$, $\eta^2 = .04$. In agreement with the egoism-justification explanation, the main effect of Resource Size Uncertainty indicates that participants gave significantly higher estimates of the resource size under High Uncertainty ($M = 554.77$) than under Low Uncertainty ($M = 482.61$).

As an additional test of the egoism-justification explanation, we tested whether the resource size estimates of proselves were higher than those of prosocials in each separate level of resource size uncertainty (See Table 2.2). Independent t-tests showed that proselves gave significantly higher resource size estimates than prosocials under Low Uncertainty ($M = 498.15$ vs. 469.73 , respectively), $t(108) = 2.46$, $p = .05$, as well as under High Uncertainty ($M = 592.59$ vs. 511.96 , respectively), $t(108) = 1.71$, $p = .05$ (one-sided). Taken together, these results support the egoism-justification explanation.

Table 2.2. Resource Size Estimates by Social Value Orientation and Resource Size Uncertainty (2 × 2)

Social Value Orientation	Resource Size Uncertainty	
	Low	High
Proselfs (<i>n</i> = 54)	498.15 (60.63)	592.59 (222.48)
Prosocials (<i>n</i> = 56)	469.73 (60.56)	511.96 (267.85)

Note. Higher scores denote higher resource size estimates. Standard deviations are given in parentheses.

SVO and Dispositional Optimism

Proselfs and prosocials did not differ significantly in their scores on the LOT-R ($M = 4.60$ vs. 4.71 , respectively), $t(108) = .65$, $p = .52$, which indicates that people differing in SVO do not differ in dispositional optimism. Additionally, no significant relations were found between participants' dispositional optimism and any of the dependent variables (all absolute r s < .13, all p s > .17).

Application of the Equal Division Rule

To assess to what degree participants anchored their decisions on the equal division rule in the different Resource Size Uncertainty conditions, we investigated to what extent their individual requests deviated from an equal share of their own resource size estimates. To do so, we calculated the absolute difference between participants' individual requests and an equal share of their own resource size estimates. A 2×3 ANOVA on this calculated deviation only yielded a significant main effect of Resource Size Uncertainty, $F(1.63, 176.23) = 6.04$, $p < .001$, $\eta^2 = .08$ (Huynh-Feldt correction of dfs), indicating that participants' requests deviated significantly more from an equal share under High Uncertainty ($M = 44.75$) than under No Uncertainty ($M = 13.03$; $p < .05$, HSD) and under Low Uncertainty ($M = 14.25$; $p < .05$, HSD). Closer inspection of these data showed that participants mostly deviated in the direction of harvesting more than an equal share.⁷ Further, additional analyses showed that with increasing resource size uncertainty, a smaller proportion of the participants requested exactly an equal share of their own resource size estimates (80% vs. 71% vs. 51%, respectively), $\chi^2(4, N = 110) = 33.00$, $p < .001$. Taken together, these results suggest that with increasing resource size uncertainty, people are less inclined to anchor their decisions on the equal division rule.

⁷ To check in which *direction* participants' requests deviated from the equal division rule, we divided their requests by their own resource size estimates. Additional analyses on this calculated proportion showed that, on average, participants requested significantly more than an equal share of their own resource size estimates in each of the three Resource Size Uncertainty conditions (all t s > 2.7, all p s < .01).

Discussion

In this chapter, we focused on environmental uncertainty in common resource dilemmas. We showed that under resource size certainty (i.e., in a “strong” social dilemma), people anchor their decisions on the equal division rule,⁸ whereas they base their decisions on their own social value orientations under resource size uncertainty (i.e., in a “weak” social dilemma). On a more general level, Study 2.1 generates new insights into the relation between social uncertainty and environmental uncertainty by showing that the way in which people deal with social uncertainty is affected by the uncertainty people may experience regarding environmental information (cf. Van Dijk et al., 1999). Our findings indicate that in situations of environmental certainty, people may adequately deal with social uncertainty by focusing on environmental cues (e.g., the size of the resource) and by using these environmental cues to apply the equal division rule. However, when such environmental cues are absent or ambiguous, the environment loses its coordinating potential (cf. Van Dijk, Wit, Wilke, & Budescu, 2004; see Wit & Wilke, 1998, for a similar argument in public goods dilemmas).

A closer inspection of our data provided additional support for this line of reasoning. When we compared people's individual requests with their own resource size estimates, their requests appeared to deviate more from an equal share under resource size uncertainty than under resource size certainty. As expected, these results suggest that under resource size uncertainty, people are less inclined to anchor their decisions on the equal division rule. In such situations, people rely more on relevant internal cues (i.e., their SVO) to determine their choice behavior.

At this point, it might be interesting to compare our results with findings reported by Roch and Samuelson (1997), who studied how people's reactions to a declining common resource were affected by replenishment rate uncertainty (i.e., uncertainty regarding the regenerating capacity of the resource). The results showed that prosocials versus proselfs did not react differently in the first phase (i.e., when the common resource was abundant) and the last phase (i.e., when the common resource was almost completely depleted) of the experimental trials. Only in the middle trials, an interaction between replenishment rate uncertainty and SVO on cooperation emerged: under replenishment rate uncertainty, proselfs harvested more than prosocials. In their discussion of this unexpected pattern of results, Roch and Samuelson suggested that the interaction between replenishment rate uncertainty and SVO might only emerge in the temporal dynamics of a social dilemma, i.e., after group members have become acquainted with the gradual decline of the resource. The present study, however,

⁸ A large majority of the participants (i.e., 80%) harvested an equal share under No Uncertainty. Not surprisingly, most of the participants who did deviate from an equal share, harvested more (rather than less) than an equal share. As a consequence, under No Uncertainty, the mean harvest was slightly higher than 100 coins.

in which we introduced resource size uncertainty in a *single-trial* common resource dilemma, suggests a more pervasive and eminent role of SVO in how people deal with environmental uncertainty. Moreover, our additional analysis, that assessed participants' adherence to the equal division rule, reveals that the influence of environmental uncertainty can best be understood by acknowledging its possible detrimental effects for tacit coordination.

Although not our primary interest, we also investigated the egoism-justification and the outcome-desirability explanations in an exploratory manner. A possible limitation of our study is that the procedure of first eliciting harvesting decisions and after that asking for resource size estimates may have facilitated the use of resource size estimates as a justification for behavior and may therefore not provide a stringent comparative test of the two explanations. Nevertheless, the obtained results seem to be in accordance with the egoism-justification explanation. Not only did proselfs request more coins from the common resource under resource size uncertainty, they also gave higher resource size estimates. Furthermore, SVO appeared to be unrelated to dispositional optimism. Altogether, these results suggest that, under environmental uncertainty, proselfs justify their "greedy" behavior by increasing their resource size estimates.⁹ In this way, resource size uncertainty provides proselfs with a convenient "excuse" for being selfish, thereby coloring their estimates with self-interest (cf. Hine & Gifford, 1996).

In a series of studies on environmental uncertainty in social dilemmas, Gustafsson et al. (1999a, 1999b) also investigated the egoism-justification explanation and the outcome-desirability explanation. These studies showed that participants not only over-harvest from an uncertain *common resource*, but even from an uncertain *private resource* (i.e., a situation in which an individual [instead of a group] owns a resource with an uncertain size). As Gustafsson et al. noted, this latter finding cannot be explained by the egoism-justification explanation, whereas it can be explained by the outcome-desirability explanation. However, as Gustafsson et al. (1999a) also pointed out, it is important to note that the different mechanisms described by these two explanations are not mutually exclusive, and that both mechanisms might be operative under resource size uncertainty. Consequently, the support Gustafsson et al. found for the outcome-desirability explanation does not necessarily falsify the egoism-justification explanation. Likewise, our present support for the egoism-justification explanation does not rule out the outcome-desirability explanation.

⁹ Interestingly, proselfs did not seem to use the equal division rule in justifying their harvests under uncertainty, i.e., they did not increase their resource size estimates to such an extent that their harvests would amount to one-fifth of these estimates.

In conclusion, by looking at social dilemmas as “weak” versus “strong” situations, the present study sheds a new light on the topic of environmental uncertainty in social dilemmas. In “strong” social dilemmas, people anchor their decisions on (tacit) coordination rules. However, to determine their choice behavior in “weak” social dilemmas, people rely more on their own social value orientations.