CEFOS REPORT 7

Distributive Justice and Cooperation in Asymmetric Social Dilemmas

Daniel Eek

ISRN GU-CEFO-R--7--SE
ISSN 1104-327x

Degree of licentiate in psychology

Abstract

Eek, D., 1996. Distributive justice and cooperation in asymmetric social dilemmas. Department of Psychology, Göteborg University, Sweden.

Social dilemmas refer to situations characterized by conflicts of interests in which people are requested to make one of two decision: Promote one's self interest or promote the collective interest. Research on distributive justice seeks answers to two main questions: How should a common resource be distributed in order to make the distribution perceived as fair? What factors affect the perceived distributive justice? The aim of the present thesis was twofold. First, to integrate these two fields of research to study the effect of distributive justice on cooperation in social dilemmas. Second, to generalize the GEF hypothesis (H. A. M. Wilke, 1991), explaining cooperation in resource dilemmas, to research on public-goods dilemmas. Two studies were conducted in which several factors were found to affect both the perceived fairness of distribution of the quality of child care provided by the municipality and people's willingness to pay for child care. In Study I, attitudes towards whether the quality of child care should be distributed equally to all children, according to the needs of the children, or proportional to how much the children's parents pay were surveyed in 1,840 Swedish parents living in five municipalities of different sizes. Preferences for different methods of payment were also measured. Although the results lent some support to the hypothesis that perceived distributive justice plays a role, other factors were found to have stronger effect on willingness to pay. In Study II, the main survey results were replicated and extended in three experiments employing a hypothetical society paradigm in which undergraduates were asked to respond to scenarios. Stronger support for the role of distributive justice was obtained.

Key words: Distributive justice, Social dilemmas, Cooperation, Willingness to pay, Social services

---

Daniel Eek, Department of Psychology, Göteborg University, Haraldsgatan 1, S-413 14 Göteborg, Sweden. Fax: +46 31 773 4628
Email: Daniel.Eek@psy.gu.se

Contents

Preface

Author's preface

Introduction and overview 13

Social dilemmas 15
Paradigms in experimental research on social dilemmas 19
Prisoner's dilemma 20
Factors affecting cooperation in social dilemmas 23
Group size 23
Social uncertainty 28
Environmental uncertainty 29
Social value orientation 30
Symmetric and asymmetric social dilemmas 31
Ability to cooperate and interest in cooperation 32

Distributive justice 35
Distributive justice in social dilemmas 37

Summary of the empirical studies
Aims and hypotheses 45

Study I 49
Study II 53
Conclusions 61

References 67

Appendix I 75

Appendix II 105

Preface

In autumn 1993, Professor Tommy Gärling and Associate Professor Anders Biel at the Department of Psychology, Göteborg University, initiated the project 'Citizens' attitudes towards paying for social services' at The Center for Public Sector Research. Unlike earlier research in social psychology, this project aimed at combining two separate paradigms, social dilemmas and distributive justice, into the same research design. The present study consists of the main findings after three years of research and it is the seventh report published by CEFOS.

The report *Distributive Justice and Cooperation in Asymmetric Social Dilemmas* is also a licentiate dissertation in psychology at the Department of Psychology, Göteborg University.

Göteborg, December 1996

Lars Strömberg
Professor, Head of The Center for Public Sector Research

Author's preface

The thesis consists of this summary and the following two studies which will be referred to by their roman numerals:

I. Biel, A., Eek, D., & Gärling, T. Distributive justice and willingness to pay for municipality child care. *Appendix I.*

II. Eek, D., Biel, A., & Gärling, T. Distributive justice and willingness to pay for municipality child care: Do results for hypothetical societies generalize? *Appendix II.*

The research summarized in this thesis is the final report of the project 'Citizens' attitudes towards paying for social services', financially supported by grants to Tommy Gärling and Anders Biel from the Center For Public Sector Research (CEFOS). Within this project the following, additional progress reports have been written:

Biel, A., Eek, D., & Gärling, T. (1996). Provision of community social services: The role of distributive fairness for willingness to pay. In W. B. G. Liebrand & D. M. Messick (Eds.), *Frontiers in social dilemmas research* (pp. 57-76). Berlin: Springer-Verlag.

Biel, A., Eek, D., & Gärling, T. (Under tryckning). Viljan att bidra till resurser för barnomsorg. *Statsvetenskaplig Tidsskrift.*

Eek, D., Biel, A., & Gärling, T. (1996). When unequal distributions of benefits in asymmetric social dilemmas are perceived as fair. *Manuscript submitted for publication.*

Working in this project has been a valuable and good experience for me. For this I am indebted to the persons whom I have been working with. First of all I would like to thank my supervisor Associate Professor Anders Biel and my examiner Professor Tommy Gärling for their professional help, scientific stimulation, and cooperation during all stages in the project.

For his help with all sorts of things, I am also grateful to my very good friend and colleague Niklas Karlsson with whom I have shared room and many good times.

I would also like to express my gratitude to Ulf Dahlstrand for his valuable help with statistics and analyzing of data, Professor Lars Strömberg and Lennart Nilsson for comments on earlier versions of the

reports, Associate Professor Joseph Schaller for his comments on the manuscript, and Sofia Flood and Vicki Johansson for assistance in collecting data.

I also thank the following colleagues in BeSaM for their valuable help and suggestions: Ole Boe, Chris von Borgstede, Niklas Fransson, Robert Gillholm, Mathias Gustafsson, Anders Johansson, Henrik Kristensen, Joakim Romanus, Dr. Marcus Selart, and Rez Shirazi.

Thanks are also due to the following colleagues at the Department of Psychology, Göteborg University, who have contributed indirectly to this research: Dr. Kurt Ernulf, Dr. Pär Anders Granhag, Dr. Sune Innala, and Dr. Bengt Jansson.

For help with practical matters, I thank Peter Samuelsson, Kjell Söderberg, and Lillemor Östberg.

For all kinds of things in life, I am very grateful to my family: Bo, Gunilla, Mattias, Jonas, Erica, Ulrica, Mikaela, Emil, and Carolina. This work is dedicated to my grandmother Ebon and the memory of my grandparents Gunnar, Ingeborg, and Åke.

Last but not least, thanks are due to all my friends.

In addition to funding for the project, I have received funding from the Adlerbert Grant Foundation, Göteborg University Foundations, and Paul and Marie Berghaus' Grant Foundation.

Göteborg, December 1996
Daniel Eek

Introduction and Overview

A fundamental condition for the functioning of our social institutions is that citizens are prepared to voluntarily contribute to the realization or the maintenance of common resources even though they themselves do not necessarily benefit from them. Another vital condition is that citizens exercise some personal restraint in order not to overuse common resources. Situations in which these two conditions are present are in psychological research referred to as social dilemmas (Dawes, 1980; Messick & Brewer, 1983). They are named dilemmas because individuals face the conflict to further the group interest or their own personal interest, and if all further their personal interests, they would have been better off if they had not. While it is in the collective interest to realize or maintain common resources, it is in an individual's interest to maximize his or her personal payoff. Thus, a society is dependent upon its citizens disregarding their selfish incentives.

Another situation in which people are asked to disregard their own interests concerns distributive justice (Rawls, 1971). How should a common resource be fairly distributed? Should everyone receive equally much? Or is it fair that poor people who need more receive more than rich people who need less? Should those who have contributed more to the resource receive more when the resource is distributed than those who have contributed less?

These two fields of research, social dilemmas and distributive justice, share several features (Tyler & Dawes, 1993). For example, in both fields

it is from the collective's point of view desirable that a person takes other people's interests into consideration when making a decision. As for social dilemmas, there is much earlier research on distributive justice. However, research which combines the two fields is rare.

The present thesis examines these two fields of research and tries to combine them into the same paradigm. More specifically, this thesis investigates the role of distributive justice for people's propensity to behave in line with the collective interest in social dilemmas. In the following section some of the earlier research on social dilemmas will be reviewed. Thereafter, distributive justice and its role in social dilemmas will be discussed. The section afterwards gives a brief summary of the empirical studies on which this thesis is based. Finally, in the last section conclusions from the empirical studies are drawn.

Social Dilemmas

Social dilemmas have inspired research in social psychology during recent years (see Komorita & Parks, 1994; Liebrand & Messick, 1996; Liebrand, Messick, & Wilke, 1992; Shulz, Albers, & Müller, 1994; Wilke, Messick, & Rutte, 1986, for reviews). A social dilemma refers to a conflict which occurs when an individual has to make one of two decisions where one favours the individual's interest and the other benefits the collective interest. The two decisions are usually called defection and cooperation, respectively. Two characteristics define the social dilemma (Dawes, 1980): (1) The rational choice for all individuals is to defect because the individual payoff is largest by such a choice, no matter what others do. (2) However, if everyone makes the rational choice to defect all are worse off than if all choose to cooperate.

In real life there are many examples of social dilemmas (Ostrom, 1992). Dawes (1980) noted the following example concerning environmental problems:

> "During pollution alerts in Eugene, Oregon, residents are asked to ride bicycles or walk rather than to drive their cars. But each person is better off driving, because his or her car's contribution to the pollution problem is negligible, while a choice to bicycle or walk yields the payoff of the drivers' exhausts. Yet all the residents are worse off driving their cars and maintaining the pollution than they would be if all bicycled or walked." (p. 170)

Another example is overpopulation. One of the classic articles on social dilemmas, Garrett Hardin's 'The tragedy of the commons' (1968) illustrates this problem by the following metaphorical anecdote: Imagine a pasture open to all herdsmen. Every rational herdsman seeks to maximize his own gain and therefore tries to keep as many cattle as possible on the commons. This is rational because the positive effect from adding one more cattle to his herd accrues to himself while the negative effect, which is the amount of the commons needed to graze the added animal, is shared between all herdsmen. However, this conclusion is reached by all rational herdsmen sharing the commons. That is the tragedy:

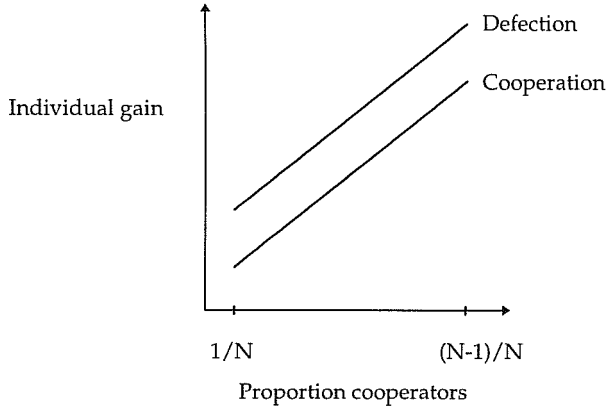
> "Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all." (p. 1244)

The examples above refer to so called resource dilemmas where each individual has to decide how much to take from a common resource which he or she has free access to. The resource is scarce and will deteriorate if not a sufficient number of people restrain their harvests. Another kind of social dilemma is the public-goods dilemma where individuals have to decide how much they shall contribute to maintain or realize a common resource. Independently of how much they contribute themselves, they will all be able to utilize the public good if this is maintained or realized. Such situations which include a temptation to utilize the pubic good without own payment or effort are also referred to as the free-rider problem (Messick & Brewer, 1983;

Olson, 1965). There is also a distinction between continuous and step-level dilemmas referring to the relation between input and outcome. In a continuous dilemma the relation is monotonic, for instance, linear. Thus, the outcome is directly determined by the input. An example is to contribute to the quality of social services. Thus, the more money that is contributed, the higher the quality of the social services. However, in a step-level dilemma a certain threshold is fixed and when a group's total degree of contribution reaches the threshold, further contribution has no effect on the outcome. An example of a step-level dilemma is to contribute money to the realization of a bridge. When the bridge is built, further investments have no effects on the outcome. As for resource dilemmas, there are several examples of public-goods dilemmas in real life. Two examples have already been mentioned. To voluntarily clean up the neighbourhood is yet an example, to pay the fee for public television is another. It is easy to see that the rational decision in social dilemmas is to defect and to not cooperate. This is illustrated in Figure 1, showing the outcomes of cooperation and defection in a continuous social dilemma. As may be seen, the highest individual gain is received when the individual is the only one who defects and the lowest gain is received when the individual is the only one who cooperates. If an individual does not help to clean up the neighbourhood while the neighbours do, the neighbourhood will still be cleaned without the individual's own effort. Similarly, even if the individual does not pay the fee for public television while others in the society do, he or she can still watch the same TV-programs as other citizens. Hence, with regard to the external payoffs it is always rational to defect. Despite that defecting is the rational choice for individuals facing social a dilemma, research has shown that people do not always make this choice (Dawes & Thaler, 1988; Van Lange, Liebrand, Messick, & Wilke, 1992). In fact, the degree

of cooperation can sometimes be very high. The question to be answered is not just what factors make people cooperate in social dilemmas, but also why people cooperate when such a behavior is irrational with regard to the external payoffs.

Figure 1. Individual Gain From Cooperation and Defection in a Continuous Social Dilemma[1].



Since almost all people now and then are confronted with decision problems such as social dilemmas, and that the functioning of our society requires that the majority of its citizens choose cooperatively in such conflicts of interests, psychological research is important for the understanding of people's behavior in social dilemmas. As we will see, this research has identified several factors which affect individuals' propensity to act in line with the common good.

[1] For illustrative purposes, Figure 1 demonstrates the consequences of defection and cooperation when the payoff functions are linear with equal slope.

Paradigms in Experimental Research on Social Dilemmas

In most experiments on public-goods dilemmas, subjects assigned to groups are given a certain amount of endowments which they are asked to decide either to keep for themselves or to contribute to a common pool. When subjects have made their decisions, the pool of contributed endowments is divided among all the group members, and the endowments each member possesses in the end of the experiment are exchanged into money. A contributed endowment is then worth more than a noncontributed endowment. No matter of what other group members do, the rational thing to do is to not contribute to the common pool since all group members will receive the same amount when the pool is divided, irrespective of own contribution. However, since each endowment the subjects possess has a certain value and the value of each contributed endowment is larger than the value of a noncontributed endowment, all group members will receive less if no one contributes any endowments compared to if all group members had contributed all the endowments. Thus, with regard to the collective interest it is rational to contribute all the endowments.

If the experiment is a step-level public-goods dilemma, the pool is divided only if the group's total contribution equals or exceeds a certain threshold, otherwise no one receives anything from the pool and the contributed endowments will not be returned. A bonus will accrue to all group members if the threshold is reached and the public good thereby realized. If the experiment is a continuous public-goods dilemma, the endowments contributed to the common pool are multiplied by a fixed factor and therefore worth more when they are divided among the group members.

In most experiments on resource dilemmas, members of a group are asked to harvest as much as they like from a common resource. If the group's total harvest is larger then the resource, no one receives anything. Otherwise everyone can keep the endowments he or she harvested. Most experimental settings of resource dilemmas encompass multiple trials. After each trial the remaining resource is replenished to some extent. In the next trial group members are asked to harvest from the replenished resource. The rational thing to do for each member is to harvest as much as possible from the resource and trust the other group members to restrain themselves from overharvesting. One-trial resource dilemmas usually use a bonus which becomes available only if a certain amount of the resource is left when all have harvested. If too much has been harvested, the bonus is not provided but each group member can keep the amount he or she has harvested.

These are the basic paradigms in the experimental research on public-goods dilemmas and resource dilemmas, respectively. However, these paradigms vary with regard to the purpose of specific experiments.

Prisoner's Dilemma

Social dilemmas are an extension of the more utilized prisoner's dilemma (Komorita & Parks, 1994). The latter is a social dilemma between two persons. It illustrates the choices and the consequences of each choice in a social dilemma in a distinct way. Suppose that you and one of your friends robbed a bank and got caught by the police[2]. You and your friend are put in separate cells. The district attorney is sure that you committed the armed robbery. However, he cannot prove it. Separately,

he gives both of you the same offer: If you confess to armed robbery and implicate your friend, both of you will be convicted, but while you will get a shorter sentence, three months, for turning state's evidence, your friend will get twenty years if he doesn't confess. If both of you confess to armed robbery, both of you will get ten years. If neither of you confesses, you will be convicted for a smaller crime, for instance illegal handling with weapons, and you will both get one year. What would you do? Would you confess or not? Remember that both of you are given the same offer separately. Table 1 illustrates the possible choices and their consequences.

Table 1. Payoff Matrix for the Prisoner's Dilemma.

		Your friend	
		Cooperates (Refuses to confess)	Defects (Confesses)
You	Cooperate (Refuse to confess)	(R) 1 year for you 1 year for your friend	(S) 20 years for you 3 months for your friend
	Defect (Confess)	(T) 3 months for you 20 years for your friend	(P) 10 years for you 10 years for your friend

(R) = Reward for mutual cooperation (1 year)

(P) = Punishment for mutual defection (10 years)

(T) = Temptation to defect (3 months)

(S) = Sucker's payoff (20 years)

[2] This story of the prisoner's dilemma is taken from Luce and Raiffa (1957).

The characteristics of a social dilemma proposed by Dawes (1980) apply to a prisoner's dilemma as well. The temptation to defect (T) corresponds to the desire to free ride in a social dilemma and has the best value for each of you. The reward for mutual cooperation (R) has a better value for each of you than the punishment for mutual defection (P). The sucker's payoff (S) corresponds to being the only one who cooperates in a social dilemma and yields the worst outcome for each of you. Thus, whatever your friend chooses to do, you are better off if you defect. If your friend cooperates and refuses to confess, you will get one year if you cooperate as well but you will only get 3 months if you defect and confess. If your friend defects and confesses, you will get 20 years if you cooperate, but only 10 years if you choose to defect. So, no matter what your friend does, you are better off defecting. No matter what you do, your friend is better off defecting. However, if you both choose to defect, you will both be worse off than if you both had chosen to cooperate. In line with Table 1, the payoff structure in a prisoner's dilemma has the property that T>R>P>S. Thus, there is a conflict between individual and collective rationality. In fact, individual rationality leads to collective irrationality.

An abundance of research has been done on how people behave in prisoner's dilemmas, both in one-trial and multiple-trial dilemmas (Colman, 1982; Pruitt & Kimmel, 1977). However, since this research deals with a conflict of interests only between two persons, it is not necessarily generalizable to many real-life social dilemmas (see Dawes, 1988; Komorita & Parks, 1994) since they most often involve more than two individuals. In fact, Wilke (1991) pointed out the similarities between social dilemmas and real-life social dilemmas as one of the main reasons to why the research on prisoner's dilemmas declined in favour of research on social dilemmas. One major difference between a prisoner's dilemma and a social dilemma is that in the former the harm

for one's defection only affects the other player and not, as in the social dilemma, is spread out among many persons. In the multiple-trial prisoner's dilemma there is also the opportunity for a person to punish the other person because of his or her former defection. Because of two reasons, this opportunity does not exist in most social dilemmas, nor in real life. First, most social dilemmas are characterized by anonymity. Second, even if one has knowledge about another person's former defection in a social dilemma, one cannot defect to direct punishment towards only that other person. Furthermore, the outcome of each trial in the prisoner's dilemma gives direct knowledge about the other player's choice and behavior. However, the social dilemma is often characterized by lack of such knowledge, labelled social uncertainty.

Factors Affecting Cooperation in Social Dilemmas

What can be done to make the collective rationality dominate the individual rationality and thereby enhance people's propensity to cooperate for the common good? Research has sought to identify factors that affect the degree of cooperation in social dilemmas. Only some of these factors will be discussed (see, e.g., Komorita & Parks (1994) for a more comprehensive review). The results are in general applicable to both public-goods and resource dilemmas.

Group Size

One factor that has been found to affect cooperation in social dilemmas is group size. This factor is important because it indicates why the social

dilemma differs from the prisoner's dilemma. Many studies have shown that the degree of cooperation decreases with an increasing group size (e.g., Hamburger, Guyer, & Fox, 1975; Komorita & Lapworth, 1982; Olson, 1965; Van Lange et al., 1992). However, Brewer and Kramer (1986) found that this effect was only true in a public-goods condition but not in a resource dilemma. Many factors can explain the effect of group size on cooperation. Because it is easier to communicate with each other in smaller rather than in larger groups, communication is one of them.

Communication

In research on social dilemmas it has been found that if members in a group are allowed to communicate with each other, the likelihood for cooperation increases (e.g., Dawes, 1980; Dawes, Van de Kragt, & Orbell, 1988). What then is it about communication that leads to more cooperative behavior? Dawes, McTavish, and Shaklee (1977) conducted an experiment to try to answer this question. They argued that there is a hierarchy of aspects involved in communication about social dilemma problems: 1) *humanization*, where subjects get to know each other as individuals; 2) *discussion*, where subjects get to discuss the dilemma they are to solve; 3) *commitment*, where subjects have the opportunity to make commitments about their own behavior and to try to elicit such commitments from the other group members. To test this hierarchy hypothesis, they used four groups and manipulated the degree to which communication was allowed. Thus, the first group was not allowed to communicate at all, the second group was allowed to communicate about an irrelevant topic, the third group could discuss the problem without asking for commitments, and the fourth group was allowed to communicate about the dilemma and was asked to make own

commitments and ask for public commitments. According to the results, the degree of cooperation was 30%, 32%, 72%, and 71% in the four groups, respectively. Hence, according to this study, it is not the communication per se that leads to more cooperation. To create more cooperation from communication, it has to be communication relevant to the situation. However, commitment had surprisingly not any effect above relevant communication on cooperation. Dawes et al. (1977) meant that this may be explained by the fact that the commitments were forced rather than arising spontaneously from the group process. Similarly, in two experiments Chen and Komorita (1994) examined the effects of commitment on cooperation in a public-goods dilemma and found higher rates of cooperation only when the pledge was binding. When the pledge was not binding, the degree of cooperation was lower for the condition where commitments were made compared to a control condition. Positive effects of commitment on cooperation have also been found by other researchers (e.g., Kerr & Kaufman-Gilliland, 1994; Van Dijk & Wilke, 1994). However, apart from communication, there are several other important explanations for the effects of group size on cooperation.

Identifiability and Anonymity

In large groups, people are generally able to make a choice between cooperation and defection believing that their choice will not be revealed to others in the group. However, the possibility of making private choices is moderate in smaller groups. There are just a few studies that have directly compared public and private choices in social dilemmas (Bixenstine, Levitt, & Wilson, 1966; Fox & Guyer, 1978; Jerdee & Rosen, 1974). These studies show higher rates of cooperation for public than for private choices.

Perceived Efficacy

The extent to which one believes that one's own contribution is important to achieve the collective goal has also been shown to affect the degree of cooperation. Van de Kragt, Orbell, and Dawes (1983) found that people are more willing to cooperate if they perceive their own contribution as critical to the group's outcome. Kerr (1989) in an experiment used two groups with 30 persons and 9 persons, respectively, and showed that an individual's perceived efficacy declined in the larger group even though the actual self-efficacy was the same for all subjects in both groups. Thus, even though there were no differences in importance of a single cooperator between the two groups, a *feeling* of being more important for the group outcome was enhanced in the smaller group. Furthermore, this illusion enhanced cooperative behavior.

Perceived Responsibility

Another factor which enhances cooperation and is related to group size is feeling of personal responsibility. The larger a group, the larger is the diffusion of responsibility and diffusion of responsibility inhibits cooperative behavior (Latané & Rodin, 1969). A study by Fleishman (1980) on cooperation in a public-goods dilemma showed that subjects' feelings of responsibility were stronger the fewer others stood to benefit from one's contributions. Perceived responsibility was also enhanced by perceived efficacy of own contributions. Finally, contributions to the public good were strongly related to feelings of personal responsibility. Thus, when one felt strongly responsible for the group outcome, one was more likely to contribute.

Social Identity

The importance of a social identity for people to act in accordance with the common good has been suggested by many researchers (for an overview, see, Tyler & Dawes, 1993). Brewer and Kramer have in several experiments studied the effect of social identity, or group identification, on cooperation in social dilemmas. Their results have been somewhat equivocal. Kramer and Brewer (1984) found in three experiments that social identity decreased resource use, that is, increased cooperation, in a resource dilemma. Social identity was either based on natural occurring categories, such as age and student status, or it was experimentally induced. In another experiment Brewer and Kramer (1986) examined the effects of group size and social identity on cooperation and found opposite effects of social identity in resource dilemmas and public-goods dilemmas. A stronger social identity[3] increased cooperation in the resource dilemma, disregarding group size. In the public-goods dilemma, however, a stronger social identity increased cooperation when group size was small and decreased cooperation when group size was large. In their review of this research, Brewer and Schneider (1990) suggested that social identity by its own is not sufficient to raise the degree of cooperation and concluded that:

> "Subgroups large enough to have an impact on the collective, yet small enough to provide a unique identity, seem to be the most effective at inducing co-operative social motives." (p. 184)

[3] Strength of social identity was induced by manipulating the way in which the value of the resource points was determined. The value was determined by a computerized lottery which was either common for all subjects (strong social identity) or individual (weak social identity).

Social Uncertainty

People's willingness to behave in accordance with collective interests is affected by knowledge about other people's behavior (e.g., Dawes et al., 1977; Messick, Wilke, Brewer, Kramer, Zemke, & Lui, 1983; Wit & Wilke, 1994). Social uncertainty refers to lack of such knowledge. There are several factors connected to social uncertainty that have been found to affect cooperation.

Assumptions About Other People's Behavior

Since uncertainty about other people's behavior in social dilemmas often is high, an important question is how people try to obtain knowledge to reduce the uncertainty. It has been suggested that people experience less social uncertainty since they frequently think that other people will behave in the same way as they intend to do themselves (De Vries & Wilke, 1992). This is an example of the utilization of social decision heuristics to reduce feelings of uncertainty. It has also been shown that a person's own cooperation is influenced by his or her expectations about other group members' degree of cooperation (Van Lange & Liebrand, 1989). If one believes that others will cooperate, one may be tempted to be a free-rider without hurting other people too much. On the other hand, if a person believes that others will defect, he or she will probably defect as well to avoid the sucker's payoff[4]. However, studies have shown that expectations about others' cooperation and one's own cooperation are strongly interrelated (Dawes et al., 1977; Messick et al., 1983). Thus, the degree to which a person cooperates is positively correlated with the expectation that others will cooperate.

[4] That is, to avoid being the only one who cooperates (see Table 1).

Fate Control

Allison and Messick (1990) used two groups in a study which examined if cooperation is affected by group members having control over each other. All subjects were led to believe that they were the first person in a group of six to harvest endowments from a limited common pool. The experimental group was instructed that the sixth group member had control over the outcomes for all group members. The reason was that if the group's total harvest exceeded the common resource no one would receive anything. The control group was informed that each group member would receive what he or she harvested, and if there were no endowments left for some members when they were in turn to harvest, they could not do anything about it. The results showed higher rates of cooperation in the experimental group compared to the control group. Thus, when subjects thought that the sixth group member had control and was able to punish a noncooperative behavior, they harvested less than when no member had control over the others.

Environmental Uncertainty

Research has shown that people's willingness to disregard their self-interests in favour for the common interest is affected by information about the resource. In a resource dilemma, environmental uncertainty refers to uncertainty about the size of the common pool or resource (Messick et al., 1983). This uncertainty can lead to what Messick and McClelland (1983) have labelled the big pool illusion. This illusion suggests that a limited resource may seem almost endless which, of course, affects the degree of cooperation negatively. As suggested by Biel and Gärling (1995), the big pool illusion is perhaps enhanced if the

resource dilemma is step-level, that is, if the resource does not deteriorate until a certain degree of defection has been reached. In a public-goods dilemma, environmental uncertainty is the same as lack of knowledge about the amount of contributions that are needed to provide the public good (Van de Kragt et al., 1983; Suleiman & Rapoport, 1992). Reduced uncertainty, both social and environmental, has been shown to enhance cooperative behavior (Budescu, Rapoport, & Suleiman, 1990; Rapoport, Budescu, Suleiman, & Weg, 1992; Wit & Wilke, 1994). (For a discussion of uncertainty in resource dilemmas, see also Biel & Gärling, 1995).

Social Value Orientation

A person's social value orientation is one of several individual factors which has been shown to affect cooperative behavior. Social values are defined and measured in terms of the weights that people assign to their own and to others' outcomes (Kuhlman & Marshello, 1975; Messick & McClintock, 1968). Although a person can have one of many possible social value orientations, four general types of social value orientations have been distinguished: *cooperation, altruism, competition, and individualism*. *Cooperators* are defined as individuals who try to maximize the joint gain; *Altruists* tend to maximize others' gain; *Competitors* try to maximize the difference between own and others' outcomes; *Individualists* are defined as people who are only interested in maximizing their own outcomes, irrespective of the outcomes received by others. However, in most experiments on the impact of social value orientations on cooperative behavior in social dilemmas, the altruistic orientation has been excluded (e.g., Van Lange & Kuhlman, 1994).

Hence, the individualistic orientation, the competitive orientation, and the cooperative orientation have been the three measured orientations.

Previous research has shown that people with cooperative social value orientations (pro-socials) cooperate more frequently in experiments on social dilemmas than individuals with individualistic and competitive social value orientations (pro-selves) (Allison & Messick, 1990; Kramer, McClintock, & Messick, 1986; Liebrand, 1984; Van Lange & Liebrand, 1989; Van Vugt, 1996). In extending these results, studies have also shown that social value orientations affect helping behavior in real life (e.g., McClintock & Allison, 1989).

Furthermore, it has been shown that individuals are affected by their social value orientations when they are asked to make judgements of a partner based on the partner's behavior in a social dilemma (Van Lange & Kuhlman, 1994). More specifically, relative to pro-selves, pro-socials perceive others more in terms of morality and honesty. Thus, a noncooperative (or cooperative) partner is considered as a bad (or good) and dishonest (or honest) person. Conversely, relative to pro-socials, pro-selves perceive others more in terms of 'might'. Thus, a noncooperative (or cooperative) partner is judged to be an intelligent (or unintelligent) and strong (or weak) person. These perceptual differences are referred to as the might versus morality effect (Liebrand, Jansen, Rijken, & Suhre, 1986).

Symmetric and Asymmetric Social Dilemmas

Previous research has often studied symmetric social dilemmas in which all group members have identical positions. That is, in a public-goods dilemma all members receive an equal share of endowments to

contribute to the common pool and if the pool is divided among the members, all receive the same share. Similarly, if a bonus is received, it is divided equally among the group members. In a symmetric resource dilemma all members can harvest from the common resource and if a bonus is received, it is divided equally among the group members.

In contrast, asymmetric social dilemmas refer to situations in which group members occupy different positions with regard to input (unequal abilities to contribute in a public-goods dilemma or to harvest in a resource dilemma) and output (a bonus, if provided, is divided unequally or there are differences in exchange rates when the endowments are exchanged into real money).

Since people in real life in general occupy different positions with regard to profits and have different abilities to cooperate, realism and generalizability increased further when asymmetric social dilemmas were introduced in experimental research. This research has identified additional factors that enhance the likelihood for cooperation in conflicts between one's self-interest and the collective interest.

Ability to Cooperate and Interest in Cooperation

It has been shown in asymmetric public-goods dilemmas that the more endowments people have, the more they contribute (Rapoport, 1988; Rapoport & Suleiman, 1993; Van Dijk & Wilke, 1995; Wit, Wilke, & Oppewal, 1992). Similarly, research has shown that when the interest in the public good increases, the degree of contribution increases (Wit et al., 1992; Marwell & Ames, 1979; Van Dijk & Wilke, 1993). An important proviso, however, is that it is considered to be justified that some occupy more advantageous positions than others. More specifically, if a person

has higher ability to cooperate or larger interest in cooperation because of luck, he or she is more likely to cooperate than others. But if a person has worked hard to receive his resource or profit, his or her degree of cooperation is less likely to be enhanced because of his or her advantageous position.

Wit et al. (1992) conducted an experiment on an asymmetric public-goods dilemma. In their study they used fictitious four-person groups to examine the effects of differential resources (ability to cooperate) and differential profits (interest in cooperation) on subjects' contributions to a public good. Subjects were in a position where they, compared to other group members, either possessed a high resource (20 endowments), an equal resource (15 endowments), or a low resource (10 endowments). In the high condition the other group members possessed 20, 10, and 10 endowments, respectively. In the equal condition all group members possessed 15 endowments and in the low condition the other group members possessed 10, 20, and 20 endowments, respectively. Subjects' interest in the resource in terms of how much profit they would receive when the resource was divided among the group members were, compared to the other group members' interests, either high (33%), equal (25%), or low (17%). In the high condition the other group members' profits were 33%, 17%, and 17%, respectively. In the equal condition all group members' profits were 25% and in the low condition the other group members' profits were 17%, 33%, and 33%, respectively. Subjects had been assigned to their positions on the basis of a chance procedure. Subjects were asked to either keep their endowments or to contribute some or all of them to the group resource. Each subject would be better off by keeping the endowments for him- or herself than by contributing, but the group as a whole would be worse off the lower the total contribution to the group resource. The results showed both main effects

of resource and profit. Subjects in the high conditions, both concerning resource and profit, contributed significantly more than subjects in the equal conditions, who in turn contributed significantly more than subjects in the low conditions.

Joireman, Kuhlman, and Okuda (1994) conducted a similar but extended experiment where they told half of their subjects that the advantageous positions were due to internal factors[5]. As predicted, they did not find any effects of position on cooperation for this group of subjects.

[5] Subjects in this group were led to believe that they had been assigned to their positions on the basis of how well they had managed to solve anagrams in a task that was performed before the actual experiment.

Distributive Justice

When a common resource is to be distributed among people in an asymmetric social dilemma, the distribution can be made in many different ways. If the resource that is to be allocated is large enough to satisfy all receivers' needs, there will not be any problems to distribute the resource in a fair manner. However, if everyone's need cannot be satisfied, a fair distribution may be difficult to achieve. How should a limited resource be distributed if the goal is to make people perceive the distribution as fair? What is a fair distribution and what factors affect the perceived fairness of distribution? These are questions that research on distributive justice seeks to answer.

Deutsch (1985) stated:

> "Broadly viewed, the concept of distributive justice is concerned with the distribution of the conditions and goods which affect individual well-being." (p. 31)

Deutsch suggested that there is a positive relationship between the well-being of individuals in a group and the well-functioning of that group. Hence, Deutsch defines the natural values of justice as the values which foster social cooperation to promote individual well-being. When a limited common resource is to be allocated there are according to Deutsch (1975) at least three discernible principles of fair distribution: *Equality*, where all receive the same; *Equity*, where the distribution is

proportional to the recipients' individual contribution to the resource that is to be allocated; *Need*, where those mostly in need receive the most. Which of these principles that will be applied is related to the collective goals. Thus, equity is linked to economic production and efficiency. Since economic production is in the group's interest, it is rational that an individual who is able to utilize a scarce resource more effectively than another person receives a greater share from the resource. A distribution according to equity will be most effective in order to enlarge the resource and hence fulfil the collective goal. Equality will be preferred in order to sustain mutual respect when social relations are in focus. A distribution according to equity in such a collective would damage the social relations of the individuals since it would implement a feeling of different values between different individuals. Finally, need should be the favoured principle when personal development and well-being are the primary goals. Since needs seldom are equally spread out in a group and rarely in proportion to individual contributions to the resource, a distribution according to another principle than need would be almost impossible when personal well-being is the goal of the distribution.

Little systematic research has tested the relationships between distributive principles of fairness and collective goals proposed by Deutsch (1975). However, Mannix, Neale, and Northcraft (1995) found in an experimental setting support for the three distributive principles and their relations to the different goals. In their study subjects were asked to play the roles of three divisional vice-presidents in a company. The three divisions differed in terms of past and predicted future performance. Subjects' task was to divide benefits and burdens among the company's three divisions. The company differed with respect to orientation and was either economically, relationship, or personal development oriented. The results showed, in line with their hypotheses, that group members

in economically oriented cultures were most likely to use a distribution according to equity, group members in relationship oriented cultures were most likely to distribute according to equality, and those in personal development oriented cultures were most likely to use a distribution according to need. Furthermore, group members distributing benefits were more likely to use an equal distribution while group members distributing burdens were more likely to use an equitable distribution. Hence, this study supported Deutsch's (1975) hypothesis that the goal of a distribution affects which principle that will be used.

Even if there is consensus among a group of people about which distributive principle to apply, difficulties can still occur. Messick (1995) identified such problems that may occur even though everyone agrees to distribute the resource according to equality. These problems refer to the interpretation and implementation of equality. The problem with interpretation has to do with the fact that sometimes one type of equality implies inequality of another type (e.g., Messick & Schell, 1992). The problem with implementation mainly concerns the type of resource that is to be distributed. For example, Messick (1995) asked how to distribute an expensive carpet according to equality. However, even though these problems are important, this thesis will focus on the question of which distributive principle, equality, equity, or need people prefer, and what factors that affect people's distributive preferences.

Distributive Justice in Social Dilemmas

There is also little research combining distributive justice and social dilemmas. This is rather strange since the two fields have much in

common which has also been pointed out by other researchers (e.g., Tyler & Dawes, 1993). For example, in both fields an individual is supposed to take other people's interests into consideration when making a decision. In that perspective both fields deal with decisions where an individual is required to disregard his or her self-interest.

A purpose of the present studies is to combine these two fields of research and more specifically to study the role of distributive justice for cooperation in social dilemmas. Although research of this kind is rare, there are a few exceptions that have underlined the importance of justice in social dilemmas, although not necessarily distributive justice. For example, puzzled by their subjects' high level of contributions to a public good, Marwell and Ames (1979) stated that the consideration of fairness is a mediating factor in investment decisions. Their subjects did not differ with regard to how much they thought a fair contribution would be. However, they differed with regard to how much they actually contributed. Thus, what determined if the normative consensus of fairness would affect the behavior was whether or not the subjects were concerned with being fair when making their contribution decisions. When Marwell and Ames discussed these results, they stated that:

> "Subjects who invested none of their tokens in the public good generally shared the normative definition of fairness held by the rest of the subjects. ...For these people, at least, 'being fair' may be driven out by greed. If the stakes are high enough, almost everyone may opt for profit over fairness." (p. 1357)

Furthermore, Joireman et al. (1994) examined subjects' fairness judgements in an asymmetric public-goods dilemma. Subjects stated the fairest possible contribution each of six persons could make to provide a

public good. These six persons differed in wealth and this was due to either internal or external factors. As they predicted, when differences in wealth were due to internal factors, it was considered fair that poor subjects contributed a larger proportion of their wealth than rich subjects. However, subjects making external attributions judged equal proportional contributions to be fair. Fairness judgements were also influenced by subjects' social value orientations. Thus, pro-socials judged equal proportional contributions to be fair, whereas pro-selves judged it to be fair that poor subjects should contribute a larger proportion of their wealth than rich subjects, irrespective of whether the reasons for differences in wealth were internal or external. Furthermore, fairness judgements were positively related to subjects' own contributions and their expectations about others' contributions. Similar results were found in the study by Wit et al. (1992).

When Wilke (1991; see also Samuelson, Messick, Wilke, & Rutte, 1986) proposed the GEF hypothesis to account for cooperation in resource dilemmas, he explicitly recognized the importance of fairness. This hypothesis is based on similar assumptions as the constrained egoism hypothesis proposed by De Vries and Wilke (1992). The GEF hypothesis states that although individuals are greedy (G), their greed is constrained by two other motives: the desire to use the resource efficiently (E) and the desire to realize fairness (F). Greed refers to the fact that individuals try to maximize their own outcomes. However, overharvesting leads to exploitation of the resource. Therefore, greed is constrained by the desire to preserve the resource. Furthermore, there is also a desire to obtain fairness for all group members, referring usually to equal final outcomes for all individuals. The GEF hypothesis could, according to Wilke (1991), explain all major results in previous research

on resource dilemmas. Another purpose of this thesis is to attempt to generalize the GEF hypothesis to research on public-goods dilemmas.

Earlier studies have shown that people in symmetrical situations, where effort and/or gain are the same for all participants, prefer a distribution based on equality (e.g., Allison & Messick, 1990; Rapoport et al., 1992; Rutte, Wilke, & Messick, 1987). This seems also to be the case when no information about wealth or benefits in asymmetrical situations, where effort and/or gain differ among participants, is given (Van Dijk & Grodzka, 1992). As suggested by Allison and Messick (1990), equality is a natural principle or heuristic which often is applied because of its simplicity and the small amount of mental effort required. This explanation is supported in a study by Harris and Joyce (1980). In their study, half of the subjects were asked to allocate payoffs and the other half of the subjects to allocate expenses among a group of others. Disregarding that group members had contributed unequally in creating a resource, they nevertheless preferred an equal split of payoffs. An equal split was also preferred when subjects were asked to divide the costs between members for establishing the resource. Here, personal wealth was neglected and none of the subjects distributed the costs between the members such that they resulted in equal final outcomes. Thus, equality was used as the distributive principle both when payoffs and expenses were allocated. When payoffs were allocated, equality led to equal final outcomes, but when costs were distributed according to equality, the allocation resulted in unequal final outcomes. This was assumed to support the idea that equality is preferred and used in distribution tasks because of its simplicity.

However, Van Dijk (1993) questioned this assumption. Rather, in line with the GEF hypothesis, he suggested that the equality principle often is applied because it provides fairness among group members (Van Dijk,

1993). The concern for fairness also seems to overrule introduced asymmetry. Thus, albeit group members could harvest different amounts from the resource, those with the possibility to harvest more did not utilize their access but harvested approximately as much as the less advantageous, which resulted in equal final outcomes for all subjects. In a follow up experiment (Van Dijk, 1993), the importance of fairness was also demonstrated when the equal-final-outcomes rule was implemented even though the implementation required extensive computations. This was seen as supporting the idea that equality is used because of fairness and not, as suggested by other researchers (e.g., Allison & Messick, 1990; Allison, McQueen, & Schaerfl, 1992; Harris & Joyce, 1980), because of simplicity.

In a study by Messick and Schell (1992), subjects were asked to distribute profits and expenses between five fictitious business partners in a fair manner. An equal distribution of the profits resulted in an unequal distribution of the expenses. Similarly, an unequal distribution of the profits resulted in an equal distribution of the expenses. The five business partners had contributed unequally to the group's profit in terms of how much they had sold. How much they had sold was either due to internal or external factors. The results showed that when differences were due to external factors, subjects distributed the profits equally which resulted in an unequal distribution of the expenses. When differences were due to internal factors, expenses were distributed equally, and hence the profits were distributed unequally. Thus, subjects regarded it as fair that one who had sold more than another because of superior skill and competence should receive more profit than one who had sold less. However, it was not regarded as fair that one who had sold more than another because of external factors such as there were

many customers in the store when he or she worked should receive more profit than one who had sold less.

Similar results concerning differences in outcomes due to justified or unjustified circumstances have been found in a study by Wilke, De Boer, and Liebrand (1986). In their study, one of four group members, the power holder, was able to take three times as much as the other group members from a common resource. This possibility was either justified or unjustified. In the justified condition, the power holder had participated in the experiment longer than the others. In the unjustified condition, the power holder had randomly been assigned to the more advantageous position. The power holder in fact worked together with the experimenter. The experiment aimed at studying the effects of the power holder's behavior on the other group members' behavior and if their behavior differed between the justified and the unjustified conditions. In half of the groups, the power holder took three times as much as the average other group member. In the other half of the groups, the power holder took as much as the average other group member. The results did not show any differences in the other group members' behavior due to justified-power or unjustified-power condition. However, subjects in groups where the power holder utilized his possibility, and took more than the average other group member, took less than subjects in groups where the power holder did not take more than the others. After the experiment subjects were asked if they considered it to be fair that the power holder could take more than they could and if they thought that the power holder should take more than they themselves. In the justified condition, a majority of the subjects thought that it was fair and that the power holder should take more than they themselves. However, in the unjustified condition, significant fewer subjects thought so.

Compared to equity and equality, fairness of the need principle has received little attention. However, Lamm and Schwinger (1980, 1983) and Schwinger and Lamm (1981) found in different experiments that differences in personal need of a resource were taken into consideration when subjects were asked to divide an amount of money between two hypothetical persons. To summarize the results from their experiments, the person who was most in need was more likely to receive more than half of the resource when (1) the two hypothetical persons were close friends compared to when they were not, (2) the needier person's need was due to external rather than internal factors (i.e., if the person was responsible for being in need or not), (3) subjects were asked to base their distribution on fairness, and (4) when the total amount of money was sufficient to satisfy both persons' needs. A person's need of a resource has also been found to be taken into consideration in ultimatum games (Oppewal & Tougareva, 1992) where one person offers another person one share of a common resource and the receiver can either accept or refuse to accept this offer. If the receiver accepts, both keep their share. However, if the receiver refuses to accept, no one receives anything. Hence, this game is similar to a social dilemma in that there is a conflict of interests.

Summary of the Empirical Studies

Aims and hypotheses

A problem faced by many societies today is that individual households are becoming less and less able to pay for social services and consequently the society must spend more money to maintain these services. Thus, it is important to gain knowledge about how to sustain willingness to pay for social services in times when such payments are becoming a burden for many households. An aim of the present studies was to investigate the role of distributive justice for cooperation in a public-goods dilemma. More specifically, what effect has distributive justice on households' willingness to pay to maintain the prevailing quality of social services? Study I was part of a larger survey study developed together with other researchers. Study II was experimental and used hypothetical societies in which subjects were asked to imagine that they were citizens. We chose to study the social service of child care provided by the municipality. One reason for this choice is that child care is a resource which either already is relevant for the subjects in our experiments, university students, or is likely to become relevant in the near future. Another reason is that child care is a social service where individual needs and degrees of utilization are clearly specified. In other social services, for instance health care and elderly care, individual needs and utilization are not as clearly specified and, more importantly, other

social services are most often connected to something bad and unfavourable. For instance, if someone needs health care, that person is ill and if someone needs elderly care, that person cannot take care of him- or herself due to some age-related illness. Since such negative aspects probably are of importance for distributive justice and willingness to pay, and we did not want subjects in our experiments to be influenced by such factors, we chose a social service where individual needs are not connected to something negative. Furthermore, since we in Study II wanted to ask our subjects to imagine that they were in need of a social service, we assumed that it would be easier for them to imagine that they had a child and needed child care than, for instance, to imagine that they were ill and in need of health care or were old and suffered from an age-related illness and therefore were in need of elderly care. Finally, Study I was part of a larger survey study also investigating other aspects of child care.

Another aim of the present studies was to try to generalize the GEF hypothesis (Wilke, 1991), explaining cooperation in resource dilemmas, to public-goods dilemmas. Although the GEF hypothesis was developed for resource dilemmas, it can be extended to public-goods dilemmas. In a resource dilemma, to be greedy is to harvest as much as possible from a common resource. Greed in a public-goods dilemma would be to contribute as little as possible to a common resource. An efficient harvest in a resource dilemma is to take the same amount from the resource as the amount to which the resource will be replenished. In a public-goods dilemma efficiency would be to contribute the amount which is required to create or maintain a public good. In the GEF hypothesis, fairness refers to equal final outcomes for all group members. Van Dijk (1993) showed that in a resource dilemma subjects coordinated their behavior in order to eliminate interest and resource asymmetries, a behavior that

resulted in equal final outcomes. However, in a public-goods condition, the proportionality rule was perceived as the fairest rule as group members with twice as many endowments contributed twice as much as those with fewer endowments. Also, group members with larger interest in the public good contributed more than group members with less interest. Hence, fairness with regard to inputs in a public-goods dilemma is for all group members to contribute the same proportion of their abilities and interests.

In the present studies, it was hypothesized that willingness to pay to maintain the prevailing quality of child care would be higher when the distribution of the child care was perceived as fair compared to when the distribution was perceived as less fair. Based on previous results from research on social dilemmas, we also hypothesized that other factors would affect willingness to pay. Such individual factors were, for instance, income and personal need. We also hypothesized that several structural factors would affect willingness to pay, such as municipality size, required number of payers (provision threshold), and method of payment. It was also of interest to study the mediating effects of these factors on perceived fairness of distribution.

Study I: Biel, A., Eek, D., & Gärling, T. Distributive justice and willingness to pay for municipality child care. *(Appendix I)*

The primary aim of Study I was to investigate the effect of perceived fairness of distribution of the quality of child care provided by the municipality on willingness to pay for child care. Attitudes towards whether the quality of child care should be distributed equally to all children, according to the needs of the children, or proportional to how much the children's parents pay were surveyed in a sample of 1,840 Swedish parents living in five municipalities of different sizes. Respondents were asked to indicate to what degree they thought that each principle should be applied and to what extent they thought that each principle actually was applied in their municipality. Preferences for different methods of payment were also measured. The method of payment was either collective (payment by taxes), proportional to use (payment by fees), or a combination thereof (payment by combined taxes and fees)[6]. Other factors of interest included in the survey were gender, household disposable income, degree of utilization of municipality child care, political party preferences, degree of education, and municipality size. Finally, respondents were also asked to indicate how they perceived the efficiency and quality of the child care that was provided by their municipality. The selection of these independent variables was guided by the GEF hypothesis (Wilke, 1991). According to this hypothesis, individuals who are not motivated to cooperate in a social dilemma because of greed may still cooperate if their greed is constrained by the desire to use the resource efficiently and to realize fairness. Although we assumed that there would not be substantial

[6] The data for payment by combined taxes and fees are not reported since they did not contribute anything in addition to the other two methods of payment.

individual differences in perceived distributive justice, some of the independent variables may have indirect effects through their effects on perceived justice of outcomes. This pertains to political party preferences and educational level. The remaining factors were assumed to have direct effects on willingness to pay since they are related to greed, efficiency, or fairness considerations.

In line with earlier research, the results showed that equality was by far the most preferred principle for distributing the quality of child care. Equity was the least preferred principle. A distribution according to the children's needs showed most variance being supported by almost as many as those who were against it. As predicted, respondents' political party preferences affected their perceptions of fair distribution. As compared to those who were indifferent, respondents preferring the Social Democrats rated the equality principle as fairer and the equity principle as less fair, those preferring the Liberals rated the need principle as fairer, and those preferring the Conservatives rated the equality principle as less fair. The analyses also indicated that fairness of the need principle decreased with income, and that fairness of the equality principle increased with degree of utilization of child care. An effect of gender was also found in that women rated that the equality principle as fairer than did men.

Willingness to pay by fees was rated as higher than willingness to pay by taxes. The hypothesis that willingness to pay by either taxes or by fees would decrease with an increased absolute difference between preferred and perceived distribution found some support in the study. Thus, when the actual distributions in the municipalities were perceived to deviate from the respondents' conceptions of distributive justice, willingness to pay decreased. However, other factors had stronger effects on willingness to pay. The most important of those was educational level.

Respondents with a university degree were more willing to pay by taxes than respondents without a degree but less willing to pay by fees. Respondents who utilized municipality child care more were more willing to pay by taxes than those who utilized it less but less willing to pay by fees. With the exception for the next largest municipality, willingness to pay by taxes was lower in smaller municipalities than in the largest. Willingness to pay by fees was higher in smaller municipalities than in the largest, again with the exception for the next largest municipality. This was not in line with what had been expected from the research on social dilemmas showing a negative relation between group size and degree of cooperation. However, it may be the case that citizens in larger cities depend more on social services than citizens in smaller municipalities. In fact, data also indicated that respondents in the larger municipalities utilized the child care more than did respondents in the smaller municipalities. A higher disposable income increased willingness to pay by taxes and decreased willingness to pay by fees. A significant gender difference indicated that women were more willing to pay by fees than men. Preference for the Conservative political party increased willingness to pay by fees and decreased willingness to pay by taxes, whereas preference for the socialist or liberal political parties increased willingness to pay by taxes and decreased willingness to pay by fees.

Study II: Eek, D., Biel, A., & Gärling, T. Distributive justice and willingness to pay for municipality child care: Do results for hypothetical societies generalize? *(Appendix II)*

The first aim of Study II was to try to replicate the results from Study I in an experimental setting. A successful replication would make it possible to further extend this research by introducing additional factors that may affect perceived fairness of distribution of child care and willingness to pay for child care. The main purpose of Experiment 1 was thus to investigate if willingness to pay for child care is affected by subjects' perceived fairness of the three distributive principles (equality, equity, and need). The study used scenarios where municipality size, income, and personal need of child care were manipulated in order to achieve variations in perceived fairness of the distributive principles and thus in willingness to pay. As Study I showed, when respondents thought that the actual distribution of child care differed from the distribution they preferred, willingness to pay declined. However, the relationship was quite weak. By employing the 'hypothetical society' paradigm (Mitchell, Tetlock, Mellers, & Ordóñez, 1993), the relationship between perceived distributive justice and willingness to pay was expected to increase. Since it is possible in scenarios to inform subjects how the child care was distributed and ask them to rate how fair they perceive the distribution, perceived fairness of distribution was thought to be more salient, and thus important, for willingness to pay. In line with the results in Study I, income and personal need of child care were thought to be positively related to willingness to pay. However, contradictory to the results from Study I, municipality size was hypothesized to be negatively related to willingness to pay since this is what is predicted from previous research on social dilemmas.

Thirty-two undergraduate students of psychology served as subjects. They were asked to imagine that they were citizens in hypothetical municipalities described in a questionnaire. Their task was to indicate how fair they perceived the same distributive principles as in Study I. They were also asked to indicate how willing they were to pay for child care according to the same methods of payment as in Study I.

In line with the hypothesis the results showed that equality was perceived as the fairest principle, followed by need. Equity was again perceived as an unfair principle for distribution of child care. When income was imagined as high (above average in the municipality), subjects perceived a distribution of child care proportional to payment as fairer compared to when they imagined their income as low (below average in the municipality).

Perceived fairness of distribution was positively related to willingness to pay. The results replicated the results in Study I in that perceived fairness of the need principle increased willingness to pay by taxes and decreased willingness to pay by fees, perceived fairness of the equity principle decreased willingness to pay by taxes, and perceived fairness of the equality principle increased willingness to pay by fees. Although a somewhat stronger relationship was obtained between perceived distributive justice and willingness to pay compared to Study I, the ratings of fairness did not account for more than about ten percent of the variance across subjects in willingness to pay. Furthermore, the effect of income was replicated in that a positive effect on willingness to pay by taxes and a negative effect on willingness to pay by fees was obtained. Contradicting the results in Study I, personal need of child care did not increase willingness to pay by taxes. However, this was probably due to an invalid manipulation of the variable degree of utilization. Even though subjects were asked to imagine that they sometimes had low and

sometimes high personal need of child care, it is not the same as different degrees of utilization. There was an effect of municipality size in the opposite direction to that found in Study I. Thus, when subjects imagined that they lived in a small municipality, they were less willing to pay by fees compared to when they imagined that they lived in a large municipality. To summarize, the results from Experiment 1 replicated the main results of Study I. The effects of perceived fairness of distribution on willingness to pay were about the same and the effect of income on willingness to pay was the same. However, personal need of child care had no effect on willingness to pay collectively (payment by taxes). The effect of municipality size on willingness to pay did not replicate the result of Study I. However, the effect obtained is in accordance with earlier research on social dilemmas.

Experiment 2 aimed at exploring why the effect of perceived fairness of distribution on willingness to pay was so weak in the previous studies. In an attempt to increase the effect, willingness to pay was measured in another way. Instead of, as in the previous experiment, ask subjects to indicate their preferences for different methods of payment (which might result in a confounding effect between perceived distributive justice and perceived justice of method of payment), we asked subjects in Experiment 2 to indicate how likely they were to voluntarily pay a monthly fee of SEK 200 (approximately $26) in order to maintain the quality of the child care. Subjects were instructed that if the number of contributors was not large enough (at least 50% of the households), the quality would be severely reduced.

The same independent variables as in Experiment 1 were manipulated. However, half of the subjects were instructed to imagine their income as below average, and the other half of the subjects were asked to imagine their income as above average. Furthermore, since the

absence of the predicted effects of personal need on willingness to pay collectively in Experiment 1 was assumed to be due to an incorrect manipulation of degree of utilization, personal need was manipulated as another between-subjects factor where half of the subjects were asked to imagine that they a child and utilized the child care, and the other half of subjects were asked to imagine that they did not have a child. Municipality size was again manipulated since the effects of this factor in the previous studies have been ambiguous.

As in the previous studies, an equal distribution of the quality of child care was perceived as the fairest distribution, followed by a distribution according to children's needs. Again, a distribution proportional to parents' payment was perceived as very unfair. Except for strong effects of distributive principles, none of the independent variables affected perceived fairness of distribution.

As predicted, the results showed that willingness to pay differed between the distributive principles. Subjects were more willing to pay when equality was the applied principle than when the need principle was applied, and least willing to pay when the distribution was in accordance with the equity principle. When perceived fairness was entered in the analysis, these effects were eliminated. Thus, the effects of distributive principles on willingness to pay could be explained by perceived distributive justice. Willingness to pay was thus higher when the distribution was perceived as fair compared to when it was perceived as less fair. The effect was somewhat stronger than in the previous studies. Furthermore, income and personal need of child care were as expected both positively related to willingness to pay and municipality size was negatively related to willingness to pay. In conclusion, in addition to perceived fairness, income, as well as personal need and municipality size to some extent accounted for the ratings of

willingness to pay. Thus, the results of Study I and Experiment 1 regarding the positive effects of perceived fairness and income on willingness to pay for child care were replicated. The effect of perceived fairness was somewhat stronger than in Experiment 1. It is possible that this enhanced role of perceived fairness is due to the different measures of willingness to pay. Furthermore, the results of Study I concerning the positive relationship between degree of utilization of child care and willingness to pay was replicated. Thus, the manipulation of degree of utilization was, in contrast to the manipulation in Experiment 1, successful.

Experiment 3 was likewise designed to study the importance of perceived distributive justice on willingness to pay. An additional aim was to study the effects of provision threshold on willingness to pay. This experiment was thus also designed as a step-level public-goods dilemma in which the required number of payers (provision threshold) was manipulated as a within-subject factor: To maintain the quality of the child care, it required that either at least 25%, 50%, or 75% of the households paid the monthly fee of SEK 200. This was assumed to lead subjects to attend to the provision threshold and adapt their payments accordingly. Furthermore, when the required number decreases, it is possible that perceived fairness increases in importance. Thus, an unfair distribution may decrease willingness to pay more when the provision threshold is low compared to when the provision threshold is high. On the other hand, when the provision threshold is high, one may believe that the collective goal will not be fulfilled and therefore, in line with the GEF hypothesis stating that the desire to maintain the efficiency of the resource enhances cooperation, be more willing to cooperate, despite the fact that the distribution is perceived as unfair. However, if one believes that the collective goal will not be fulfilled because the provision

threshold is high, it is also possible that one will defect in order not to lose one's own contribution. Thus, it was of interest to study the effects of provision threshold on willingness to pay.

Personal need of child care was again manipulated as a between-subjects factor in the same way as in Experiment 2.

Since previous research on social dilemmas has shown that propensity to cooperate is influenced by assumptions about other people's behavior (Dawes et al., 1977; Messick et al., 1983), willingness to pay was assumed to vary with subjects' expectations about how many others they thought would pay. Based on this previous research indicating a positive relationship between own behavior and assumptions about others' behavior, it was expected that if subjects thought that others would pay, they would be more willing to pay themselves compared to if they did not think that others would pay.

The results again showed that the equality principle was perceived as fairer than the need principle, and the need principle was perceived as fairer than the equity principle. However, an effect of the variable personal need of child care indicated that there were hardly no differences in perceived fairness between the equality and the need principles for subjects with no personal need of child care. This replicates the results in Study I where it was found that degree of utilization of child care increases perceived fairness of the equality principle.

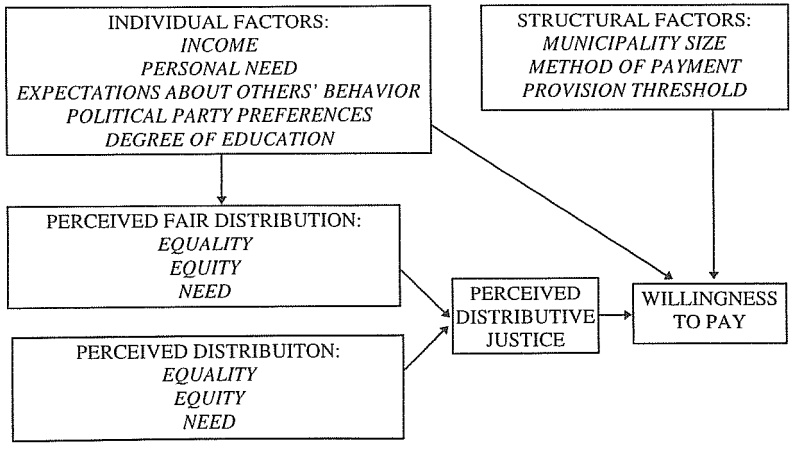
As predicted, effects of distributive principles on willingness to pay were found to be eliminated by perceived distributive justice. Furthermore, provision threshold increased willingness to pay. When the number of required payers increased, own willingness to pay increased as well. Thus, subjects adopted their contributions according to the thresholds. Personal need was again found to increase willingness to pay.

Expectations about others' payment also had strong positive effects on willingness to pay. Since in line with earlier research on social dilemmas there was a positive correlation between the propensity to cooperate and beliefs that others will, a desire to 'free ride' does not seem to be the prominent motive. Rather, people avoid defecting if they believe that others will cooperate or believe that others will cooperate if they cooperate themselves. In line with the GEF hypothesis, this may be related to fairness considerations: When subjects thought that others would not contribute, they may have regarded it as unfair that they should. Similarly, it is likely that subjects regarded it as unfair not to contribute when they believed that others would.

Conclusions

A purpose of the thesis was to try to combine two fields of research, social dilemmas and distributive justice, into the same paradigm. More specifically, the purpose was to study the role of distributive justice for cooperation in social dilemmas. Guided by the GEF hypothesis (Wilke, 1991) we tried to locate factors which affect willingness to pay for child care provided by the municipality. In Figure 2, the results of Study I and Study II are summarized.

Figure 2. Factors Affecting Perceived Distributive Justice of Municipality Child Care and Willingness to Pay for Municipality Child Care.



In accordance with earlier research on social dilemmas, three individual factors were found to affect willingness to pay. Ability to cooperate, in terms of income, and interest in cooperation, in terms of personal need and utilization of the resource, both affected willingness to pay positively. Both these factors also affected what was perceived as a fair distribution of the quality of child care. A third individual factor was expectations about others' behavior. There was a positive relationship between willingness to pay and expectations about others' contributions. However, if a person receives feedback about how others actually behave, a question raised is whether or not the relationship between how this person acts and how others act still would be positive. It is possible that greed would be a more prominent motive if one knows for sure that the public good will be realized without own contribution.

Two additional individual factors were also found to affect willingness to pay in Study I, degree of education and political party preferences. Not surprisingly, the latter was also strongly related to perceived distributive justice.

Three structural factors were found to have direct effects on willingness to pay. Municipality size increased willingness to pay in Study I. However, in Study II, previous research on social dilemmas was replicated in that municipality size decreased willingness to pay. The explanation given to the result of Study I, suggesting a confounding effect with degree of utilization, may resolve this contradiction. Thus, the fact that citizens in larger municipalities utilized the service more than citizens in smaller municipalities may explain the positive relationship between cooperation and municipality size in Study I. It may also be the case that a social identity in connection with child care is established in smaller units than a municipality, such as the day care center one utilizes.

Method of payment also affected how much respondents were willing to pay in Study I and in Experiment 1 in Study II. Generally, factors that affected willingness to pay by taxes positively were negatively related to willingness to pay by fees. However, the results of Study I and Experiment 1 in Study II concerning method of payment were somewhat equivocal in that payment by fees was generally preferred over payment by taxes in Study I and the opposite result was found in Experiment 1 in Study II. However, the main thing is that in both cases, the same factors had the same effects on the two methods of payment.

The third structural factor that affected willingness to pay was provision threshold, that is, variations in the amount of required contribution. The higher the amount of required contribution, the higher was willingness to pay.

Since the results of the present studies showed that willingness to pay is to some extent predicted from the GEF hypothesis (Wilke, 1991), which embraces a large number of results from laboratory-based social-dilemma studies (Komorita & Parks, 1995), it appears as if framing payment for social services as a public-goods dilemma may be a viable approach. At the same time, the results reinforced the generalizability of the GEF hypothesis to public-goods dilemmas and to the class of real-life social dilemmas which the provision of social services provided by the municipality constitutes.

However, the relationship between perceived distributive justice and willingness to pay was not as strong as what was predicted. There are several possible reasons for this. Perhaps the most important one is that perceived fairness did not vary much across individuals, neither in the experiments in Study II with their rather homogeneous samples nor in Study I with its more heterogeneous sample. Although some individual differences were observed to be related to different factors such as

political party preferences, income, and degree of utilization, almost all participants in Studies I and II believed that it was fair that the quality of child care is distributed equally in the first place, according to need in the second place. There was in fact strong objection against a distribution based on how much users pay. This is perhaps surprising since this principle is likely to be fair when applied to everyday economic transactions. Thus, most often when you want to buy a product in a store, you receive the product with a better quality for a higher price. Why was it perceived as unfair that children to parents who pay more receive better care than children to parents who pay less? We suggest two possible reasons. First, the common resource studied was child care provided by the municipality. Perhaps there is a general opinion that a resource which is provided by the municipality should be distributed equally among all the citizens in the municipality. Hence, equity was perceived as an unfair distributive principle. As a consequence, if the resource that is to be allocated is provided by private corporations, equity might be perceived as fairer. Indeed, Lane's (1986) discussion about market justice versus political justice suggests that while equality and need are the preferred distributive principles in the polity, equity is the preferred principle in the market. In line with Lane's (1986) proposals and the importance of the goals of a distribution suggested by Deutsch (1975), distribution of a service provided by the municipality is perhaps perceived as fulfilling other goals than distribution of a service provided by private corporations. Whereas a service provided by the municipality seeks to take care of all individual interests equally, it is possible that a privately provided service is more focused on standard economic transactions, such as, for instance, you receive what you pay for. Second, it may be the case that people do not think that services provided by the municipality *do* differ with regard to quality. Although

information about differences in quality was implicit in the definition of the three distributive principles, subjects might not have attended to these differences. However, if differences in quality of child care are more explicitly pointed out, equity might be perceived as fairer. Further research is required to see if these suggestions are valid.

Furthermore, it is possible that equity will be perceived as fair if this principle is applied to the quantity of child care. Whether the endorsement of the equality (and need) principle pertaining to the quality of child care is only typical for the political system of Sweden is a question which also must await further research. Nevertheless, that small individual differences in what is perceived to be fair may be an important reason for the weak support for the 'distributive justice-willingness to pay-hypothesis' is suggested by the fact that fairness accounted for more of the variance in willingness to pay across hypothetical municipalities in which the distributive principles varied.

It should be added that, in Study I larger variation was observed in what respondents believed were the true distributions of the quality of child care in the different municipalities. The results suggested however that the perceived true distribution may be less important for willingness to pay. Nevertheless, it may be the case that fairness influences willingness to pay when people experience that actual policy diverges greatly from their own conceptions of distributive justice. For instance, if the least fair principle of distribution, equity, was implemented by authorities, willingness to pay for a social service might drastically decline.

Interestingly, although personal utilization had a positive effect on willingness to pay, respondents in Study I who did not utilize the municipality child care at all were still quite willing to pay collectively for child care. In fact, the means for willingness to pay by taxes did not

differ much between those respondents who did not utilize the municipality child care (M = 2.32) and those who utilized it full time (M = 2.87). Thus, citizens' attitudes towards paying taxes for social services are not as negative as one might suspect - a further indication that greed is not people's prominent motive. These results were also replicated in Study II since those subjects who did not utilize the child care were still willing to pay to maintain the prevailing quality of child care, although less willing than those who utilized the child care.

Two additional questions can be raised from the present research: Do the results of Studies I and II generalize to other social services, such as health care, elderly care, and schools, and will willingness to pay differ if money is collected to increase the quality instead of maintaining the prevailing quality?

Finally, it is important to note that the main results of Study I were successfully replicated in Study II employing the hypothetical-society paradigm (Mitchell et al., 1993). The advantage of having experimental control may thus be maintained while variations due to personal experiences are added. In future research these methods may serve complementary purposes.

References

Allison, S. T., McQueen, L. R., & Schaerfl, L. M. (1992). Social decision making processes and the equal partitionment of shared resources. *Journal of Experimental Social Psychology, 28*, 23-42.

Allison, S. T., & Messick, D. M. (1990). Social decision heuristics in the use of shared resources. *Journal of Behavioral Decision Making, 3*, 195-204.

Biel, A., & Gärling, T. (1995). The role of uncertainty in resource dilemmas. *Journal of Environmental Psychology, 15*, 221-233.

Bixenstine, V. E., Levitt, C. A., Wilson, K. R. (1966). Collaboration among six persons in a prisoner's dilemma game. *Journal of Conflict Resolution, 10*, 488-496.

Brewer, M. B., & Kramer, R. M. (1986). Choice behavior in social dilemmas: Effects of social identity, group size, and decision framing. *Journal of Personality and Social Psychology, 50*, 543-549.

Brewer, M. B., & Schneider, S. K. (1990). Social identity and social dilemmas: A double-edged sword. In D. Abrams, & M. A. Hogg (Eds.), *Social identity theory. Constructive and critical advances*, (pp. 169-184). New York: Harvester Wheatsheaf.

Budescu, D. V., Rapoport, A., & Suleiman, R. (1990). Resource dilemmas with environmental uncertainty and asymmetric players. *European Journal of Social Psychology, 20*, 475-487.

Chen, X-P., & Komorita, S. S. (1994). The effects of communication and commitment in a public goods social dilemma. *Organizational Behavior and Human Decision Processes, 60*, 367-386.

Colman, A. M. (1982). *Game theory and experimental games.* Oxford: Pergamon Press.

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31*, 169-193.

Dawes, R. M. (1988). *Rational choice in an uncertain world.* San Diego: Harcourt Brace, Brace, Jovanovich.

Dawes, R. M., McTavish, J., & Shaklee, H. (1977). Behavior, communication, and assumptions about other people's behavior in a commons dilemma situation. *Journal of Personality and Social Psychology, 35,* 1-11.

Dawes, R. M., & Thaler, R. H. (1988). Anomalies: Cooperation. *Journal of Economic Perspectives, 2,* 187-197.

Dawes, R. M., Van de Kragt, A. J. C., & Orbell, J. M. (1988). Not me or thee but we: The importance of group identity in eliciting cooperation in dilemma situations: Experimental manipulations. *Acta Psychologica, 68,* 83-97.

Deutsch, M. (1975). Equity, equality, and need: What determines which value will be used as the basis for distributive justice? *Journal of Social Issues, 31,* 137-149.

Deutsch, M. (1985). *Distributive justice: A social psychological perspective.* New Have, CT: Yale University Press.

De Vries, S., & Wilke, H. A. M. (1992). Constrained egoism and resource management under uncertainty. In W. Liebrand, D. M. Messick, & H. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings* (pp. 81-99). Oxford: Pergamon.

Fleishman, J. A. (1980). Collective action as helping behavior: Effects of responsibility diffusion on contributions to a public good. *Journal of Personality and Social Psychology, 38,* 629-637.

Fox, J., Guyer, M. (1978). "Public" choice and cooperation in n-person prisoner's dilemma. *Journal of Conflict Resolution, 22,* 468-481.

Hamburger, H., Guyer, M., & Fox, J. (1975). Group size and cooperation. *Journal of Conflict Resolution, 19,* 503-531.

Hardin, G. (1968). The tragedy of the commons. *Science, 162,* 1243-1248.

Harris, R. J., & Joyce, M. A. (1980). What's fair? It depends on how you phrase the question. *Journal of Personality and Social Psychology, 38,* 165-179.

Jerdee, T. H., & Rosen, B. (1974). Effects of opportunity to communicate and visibility of individual decisions on behavior in the common interest. *Journal of Applied Psychology, 59,* 712-716.

Joireman, J. A., Kuhlman, D. M., & Okuda, H. (1994). Fairness judgements in an asymmetric public goods dilemma. In U. Shulz, W. Albers, & U. Müller (Eds.), *Social dilemmas and cooperation* (pp. 99-116). Berlin: Springer-Verlag.

Kerr, N. L. (1989). Illusions of efficacy: The effects of group size on perceived efficacy in social dilemmas. *Journal of Experimental Social Psychology, 25,* 287-313.

Kerr, N. L., & Kaufman-Gilliland, C. M. (1994). Communication, commitment, and cooperation in social dilemmas. *Journal of Personality and Social Psychology, 66*, 513-529.

Komorita, S. S., & Lapworth, C. W. (1982). Cooperative choice among individuals versus groups in an *N*-person dilemma situation. *Journal of Personality and Social Psychology, 42*, 487-496.

Komorita, S. S., & Parks, C. D. (1994). *Social dilemmas.* Madison, Wn: Brown & Benchmark.

Komorita, S. S., & Parks, C. D. (1995). Interpersonal relations: Mixed-motive interaction. *Annual Review of Psychology, 46*, 183-207.

Kramer, R. M., & Brewer, M. B. (1984). Effects of group identity on resource use in a simulated commons dilemma. *Journal of Personality and Social Psychology, 46*, 1044-1057.

Kramer, R. M., McClintock, C. G., & Messick, D. M. (1986). Social values and cooperative response to a simulated resource conservation crisis. *Journal of Personality, 54*, 576-592.

Kuhlman, D., & Marshello, A. (1975). Individual differences in game motivation as moderators of preprogrammed strategy effects in prisoner's dilemma. *Journal of Personality and Social Psychology, 32*, 922-931.

Latané, B., & Rodin, J. (1969). A lady in distress: Inhibiting effects of friends and strangers on bystander interventions. *Journal of Experimental Social Psychology, 5*, 189-202.

Lamm, H., & Schwinger, T. (1980). Norms concerning distributive justice: Are needs taken into consideration in allocation decisions? *Social Psychology Quarterly, 43*, 425-429.

Lamm, H., & Schwinger, T. (1983). Need consideration in allocation decisions: Is it just? *Journal of Social Psychology, 119*, 205-209.

Lane, R. E. (1986). Market justice, political justice. *American Political Science Review, 80*, 383-402.

Liebrand, W. B. G. (1984). The effect of social motives, communication and group size on behaviour in an N-person multi-stage, mixed-motive game. *European Journal of Social Psychology, 14*, 239-264.

Liebrand, W. B. G., Jansen, R. W. T. L., Rijken, V. M., & Suhre, C. J. M. (1986). Might over morality: Social values and the perception of other players in experimental games. *Journal of Experimental Social Psychology, 22*, 203-215.

Liebrand, W. B. G., Messick, D. M. (Eds.). (1996). *Frontiers in social dilemmas research.* Berlin: Springer-Verlag.

Liebrand, W. B. G., Messick, D. M., & Wilke, H. A. M. (Eds.). (1992). *Social dilemmas: Theoretical issues and research findings.* Oxford: Pergamon.

Luce, R. D., & Raiffa, H. (1957). *Games and decisions.* New York: Wiley.

Mannix, E. A., Neale, M. A., & Northcraft, G. B. (1995). Equity, equality, or need? The effects of organizational culture on the allocation of benefits and burdens. *Organizational Behavior and Human Decision Processes, 63,* 276-286.

Marwell, G., & Ames, R. E. (1979). Experiments on provision of public goods. I. Resources, interest, group size, and the free-rider problem. *American Journal of Sociology, 84,* 1335-1360.

McClintock, C. G., & Allison, S. T. (1989). Social value orientation and helping behavior. *Journal of Applied Social Psychology, 19,* 353-362.

Messick, D. M. (1995). Equality, fairness, and social conflict. *Social Justice Research, 8,* 153-173.

Messick, D. M., & Brewer, M. B. (1983). Solving social dilemmas: A review. In L. Wheeler, & P. Shaver (Eds.), *Review of personality and social psychology,* (Vol. 4, pp. 11-44). Beverly Hills: Sage.

Messick, D. M., & McClelland, C. L. (1983). Social traps and temporal traps. *Personality and Social Psychology Bulletin, 9,* 105-110.

Messick, D. M., & McClintock, C. G. (1968). Motivational bases of choice in experimental games. *Journal of Experimental Social Psychology, 4,* 1-25.

Messick, D. M., & Schell, T. (1992). Evidence for an equality heuristic in social decision making. *Acta Psychologica, 80,* 311-323.

Messick, D. M., Wilke, H., Brewer, M. B., Kramer, R. M., Zemke, P. E., & Lui, L. (1983). Individual adaptations and structural change as solutions to social dilemmas. *Journal of Personality and Social Psychology, 44,* 194-309.

Mitchell, G., Tetlock, P. E., Mellers, B. A., & Ordóñez, L. D. (1993). Judgments of social justice: Compromises between equality and efficiency. *Journal of Personality and Social Psychology, 65,* 629-639.

Olson, M. (1965). *The logic of collective action.* Cambridge Mass., Harvard University Press.

Oppewal, H., & Tougareva, E. (1992). A three-person ultimatum game to investigate effects of differences in need, sharing rules and observability on bargaining behaviour. *Journal of Economic Psychology, 13,* 203-213.

Ostrom, E. (1992). *Governing the commons. The evolution of institutions for collective action.* Cambridge. Cambridge University Press.

Pruitt, D. G., & Kimmel, M. J. (1977). Twenty years of experimental gaming: Critique, synthesis, and suggestions for the future. *Annual Review of Psychology, 28,* 363-392.

Rapoport, A. (1988). Provision of step-level goods: Effects of inequality in resources. *Journal of Personality and Social Psychology, 54,* 432-440.

Rapoport, A., Budescu, D. V., Suleiman, R., & Weg, E. (1992). Social dilemmas with uniformly distributed resources. In W. B. G. Liebrand, D. M. Messick, & H. A. M. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings.* Oxford: Pergamon Press.

Rapoport, A., & Suleiman, R. (1993). Incremental contribution in step-level public goods games with asymmetric players. *Organizational Behavior and Human Decision Processes, 55,* 171-194.

Rawls, J. (1971). *A theory of justice.* Cambridge, MA.: Harvard University Press.

Rutte, C. G., Wilke, H. A. M., & Messick, D. (1987). Scarcity or abundance caused by people or the environment as determinants of behavior in the resource dilemma. *Journal of Experimental Social Psychology, 23,* 208-216.

Samuelson, C. D., Messick, D. M., Wilke, H. A. M., & Rutte, C. G. (1986). Individual restraint and structural change as a solution to social dilemmas. In H. Wilke, D. Messick, & C. Rutte (Eds.), *Experimental social dilemmas* (pp. 29-53). New York: Verlag Peter Lang.

Schwinger, T., & Lamm, H. (1981). Justice norms in allocation decisions: Need consideration as a function of resource adequacy for complete need satisfaction, recipients' contributions, and recipients' interpersonal attraction. *Social Behavior and Personality, 9,* 235-241.

Shulz, U., Albers, W., & Müller, U. (Eds.). (1994). *Social dilemmas and cooperation* (pp. 99-116). Berlin: Springer-Verlag.

Suleiman, R., & Rapoport, A. (1992). Provision of step-level public goods with continuous contribution. *Journal of Behavioral Decision Making, 5,* 133-153.

Tyler, T., & Dawes, R. M. (1993). Fairness in groups: Comparing the self-interest and social identity perspectives. In B. A. Mellers, & J. Baron (Eds.), *Psychological perspectives on justice: Theory and applications* (pp. 87-108). New York: Cambridge University Press.

Van de Kragt, A., Orbell, J., & Dawes, R. M. (1983). The minimal contributing set as a solution to public goods problems. *American Political Science Review, 77,* 112-122.

Van Dijk, E. (1993). *Coordination in asymmetric social dilemmas.* University of Leiden, doctoral dissertation.

Van Dijk, E., & Grodzka, M. (1992). The influence of endowments asymmetry and information level on the contribution to a public step good. *Journal of Economic Psychology, 13,* 329-342.

Van Dijk, E., & Wilke, H. A. M. (1993). Differential interests, equity, and public good provision. *Journal of Experimental Social Psychology, 29,* 1-16.

Van Dijk, E., & Wilke, H. A. M. (1994). Conditional contributions and public good provision. In U. Shulz, W. Albers, & U. Müller (Eds.), *Social dilemmas and cooperation* (pp. 173-185). Berlin: Springer-Verlag.

Van Dijk, E., & Wilke, H. A. M. (1995). Coordination rules in asymmetric social dilemmas: A comparison between public good dilemmas and resource dilemmas. *Journal of Experimental Social Psychology, 31,* 1-27.

Van Lange, P. A. M., & Kuhlman, D. M. (1994). Social value orientations and impressions of partner's honesty and intelligence: A test of the might versus morality effect. *Journal of Personality and Social Psychology, 67,* 126-141.

Van Lange, P. A. M., & Liebrand, W. B. G. (1989). On perceiving morality and potency: Social values and the effects of person perception in a give-some dilemma. *European Journal of Personality, 3,* 209-225.

Van Lange, P. A. M., Liebrand, W. B. G., Messick, D. M., & Wilke, H. A. M. (1992). Introduction and literature review. In W. Liebrand, D. M. Messick, & H. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings* (pp. 3-28). Oxford: Pergamon.

Van Vugt, M. (1996). *Social dilemmas and transportation decisions.* University of Limburg, doctoral dissertation.

Wilke, H. A. M. (1991). Greed, efficiency and fairness in resource management situations. In W. Stroebe, & M. Hewstone (Eds.), *European review of social psychology* (Vol. 2, pp. 165-187). New York: Wiley & Sons.

Wilke, H. A. M., De Boer, K. L., & Liebrand, W. B. G. (1986). Standards of justice and quality of power in a social dilemma situation. *British Journal of Social Psychology, 25,* 57-65.

Wilke, H. A. M., Messick, D. M., & Rutte, C. G. (Eds.). (1986). *Experimental social dilemmas.* Frankfurt: Verlag Peter Lang.

Wit, A., Wilke, H. (1994). Public good provision under environmental and social uncertainty. *Unpublished manuscript.*

Wit, A., Wilke, H. A. M., & Oppewal, H. (1992). Fairness in asymmetric social dilemmas. In W. B. G. Liebrand, D. M. Messick, & H. A. M. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings* (pp. 183-197). Oxford: Pergamon Press.

Appendix I

Distributive Justice and Willingness to Pay for Municipality Child Care

Anders Biel, Daniel Eek, and Tommy Gärling

Abstract

With the aim of investigating factors affecting willingness to pay for municipality child care, a survey was undertaken in Sweden of 1,840 parents living in five municipalities of different sizes. On the basis of the GEF hypothesis (H. A. M. Wilke, 1991) which is supported by results from experimental social dilemma research, it was hypothesized that perceived fairness of how the quality of child care is distributed (equal, proportional to need, or proportional to payment) as well as of method of payment (collectively by taxes or proportional to use by fees) would be important determinants of willingness to pay. The results showed that perceived fairness of how quality of child care is distributed played some role but that other factors had stronger effects. Perhaps also reflecting fairness considerations, willingness to pay by fees was on average higher than willingness to pay by taxes. Predicted from previous research, willingness to pay by taxes was furthermore found to increase with income and degree of use. However, willingness to pay by taxes showed an increase rather than the predicted decrease with municipality size.

Keywords: Distributive justice, fairness, social dilemmas, willingness to pay, child care.

In a public-goods dilemma people are asked to contribute to a resource to which all have free access (Dawes, 1980; Komorita & Parks, 1995; Messick & Brewer, 1983). Provided that a sufficient number contribute, everyone will benefit from the public good irrespective of whether they contribute or not. A parallel situation termed a resource or commons dilemma is that people have free access to an available common resource which will be depleted unless a sufficient number restrain themselves from taking from the resource. Both kinds of dilemmas exist because the individual "rational" choice is to not contribute or to take. However, everyone will end up worse if all make this choice. Because the collective benefits are obtained even if not everyone cooperates (gives or restrains from taking), there is the temptation to free ride and receive additional individual benefits. Self-interest is thus in conflict with the welfare of a group or sometimes society at large.

Crucial questions concerning whether social dilemmas (the generic term introduced by Dawes, 1980) are solved or not include when and why people cooperate. In experimental studies, both situational and individual factors have been shown to enhance cooperation (Biel & Gärling, 1995; Van Lange, Liebrand, Messick, & Wilke, 1992). A recurrent finding is that decreasing group size leads to increased cooperation, at least in small groups (e.g., Hamburger, Guyer, & Fox, 1975; Komorita & Lapworth, 1982; Olson, 1965). Furthermore, in resource dilemmas cooperation has been shown to increase substantially as a result of group identification (Brewer & Kramer, 1986; Kramer & Brewer, 1984; Orbell, Van de Kragt, & Dawes, 1988). Without such identification people instead use up the resource. Group identification may be linked to what Tajfel and Turner (1986) refer to as social identity: When social identity is salient people react as part of a group rather than as individuals. Thus, increasing the welfare of the group becomes more important since it is

seen as promoting self-interest. In addition, group identity activates internalized norms. One such norm is social responsibility (Kerr, 1983) implying, for instance, that everyone should contribute. Fairness of distribution of contributions and outcomes is another norm (Joireman, Kuhlman, & Okuda, 1994; Van Dijk & Wilke, 1993; Wilke, 1991; Wit, Wilke, & Oppewal, 1992). There are also consistent individual differences in cooperation: A social value orientation implies a preference for a particular allocation of a resource among oneself and others (Kuhlman & Marshello, 1975). Individuals with cooperative social value orientations have been shown to cooperate more frequently in social dilemmas than those with individualistic or competitive social value orientations (Allison & Messick, 1990; Van Lange & Liebrand, 1989).

Today when resources for municipality social services are decreasing, citizens may be asked to contribute more through taxes or fees. How can this be accomplished without increasing free riding? To answer this question requires a basic understanding of which factors affect willingness to pay for social services such as, for instance, municipality child care. What contribution can social dilemma research make in identifying such factors? In proposing the GEF hypothesis based on this research, Wilke (1991; see also Samuelson, Messick, Wilke, & Rutte, 1986) recognized the importance of distributive justice. The hypothesis states that although individuals are motivated to defect in a social dilemma because of greed (G), they may instead cooperate because their greed is constrained by two other motives: the desire to use the resource efficiently (E), and the desire to realize fairness (F). Greed refers to the fact that individuals try to maximize their own outcomes. However, if no one contributes to the public good, the common resource will not be realized and own outcomes will consequently be zero. Therefore, greed

is constrained by the desire to realize the resource. Furthermore, the desire is also to achieve justice to all group members. Guided by the GEF hypothesis, we will below enumerate several factors which may affect willingness to pay for municipality child care.

Fairness

Notwithstanding that social dilemma research shares several features with research on social justice, contacts with that field of research have been rare (Tyler & Dawes, 1993). In previous research on social dilemmas, the case has generally been that contributions and outcomes are symmetrical or equal (Van Lange et al., 1992). When the size of the resource is unknown people request an equal share of the common resource (Rapoport, Budescu, Suleiman, & Weg, 1992; Rutte, Wilke, & Messick, 1987). This seems also to be the case in asymmetric social dilemmas (unequal distribution of contributions and/or outcomes) if no information about wealth or benefits is given (Van Dijk & Grodzka, 1992). As suggested by Allison and Messick (1990), equality may be a natural principle to apply. This is, for instance, supported by the results of a study by Harris and Joyce (1980). Disregarding that group members had contributed unequally in creating the resource, subjects in one condition preferred equal payoffs. Somewhat paradoxically, an equal split was also preferred when the same subjects were asked to divide the costs between group members in establishing the resource.

When people know about an asymmetry, equity appears to become a preferred distributive principle (Messick & Schell, 1992; Van Dijk & Grodzka, 1992; Wilke, Liebrand, Lotgerink, & Buurma, 1986). An important proviso is that the asymmetry is regarded as fair (Messick &

Schell, 1992; Van Dijk & Wilke, 1993). For instance, hard work to create a resource is a better reason than luck to change from equality to equity.

In asymmetric public-goods dilemmas with continuous contributions, those with large resources or high profit rates contribute more than those with small resources or low profit rates (Marwell & Ames, 1979; Wit et al., 1992). Similarly, Rapoport (1988) and Rapoport and Suleiman (1993) reported that people with different endowments contributed the same proportion of their endowments, although not all subjects adhered to this equity principle.

Among citizens in municipalities different principles of justice may be prevalent. Whereas the social dilemma research has been limited to equality and equity as just principles for how outcomes are distributed, according to Deutsch (1975) there are at least three discernible such principles: (1) *Equity* implying a distribution proportional to the contribution; (2) *Equality* implying an equal distribution independent of contribution; and (3) *Need* implying a distribution proportional to need. According to Deutsch, which of these principles that will be applied is related to collective goals. Thus, equity is linked to economic production and efficiency. Equality will be preferred in order to sustain mutual respect when social relations are in focus. Need should be the favoured principle when personal development and well-being are the primary goals. (For the relevance of Deutsch's hypothesis about goal-dependent preferences for justice principles in various situations, see, e.g., Martin & Harder, 1994; Meeker & Elliott, 1995; Törnblom & Foa, 1983).

An important question asked in the present study was what determines what citizens perceive as a fair principle of distributing the quality of municipality child care. The research was conducted in Sweden where child care is supplied by municipalities. Although fees and taxes for child care are based on income and degree of use rather

than being equally distributed among parents of children who use child care, an official principle is that the *quality* of child care should be equal for all children. However, in conflict with the official equality principle, some may believe that the quality of child care should be proportional to how much parents pay. We call this principle equity. A third possibility is that some believe that the quality of child care should meet the needs children have (e.g., higher for young children whose needs are greater), irrespective of how much their parents pay. This is called the need principle. The role of justice of this principle for cooperation in social dilemmas has rarely been investigated (but see Lamm & Schwinger, 1980, 1983; Oppewal & Tougareva, 1992; Schwinger & Lamm, 1981). However, the need principle is clearly also quite salient when municipalities provide a social service like child care. In a survey reported below, we measured how fair parents believe the equality, equity, and need principles are. Although we expected the equality principle to be endorsed by a large majority of respondents, we realize that there may be differences between parents with respect to what they consider to be a fair distributive principle.

Another question raised was whether those who endorse the equality (or equity or need) principle of just distribution of quality of child care are more willing to pay for the service if they believe that the principle is followed. Although we assume that people may to some extent vary in how fair they consider the equality, equity, or need principles, consistent with the GEF hypothesis (Wilke, 1991) willingness to pay for child care may similarly vary with the (absolute) difference between the degree to which the principle of distributing the quality of child care is perceived to be fair and the degree to which it is perceived to be followed. To test this hypothesis in the survey, in addition to measuring what is considered to be a fair principle we measured the degree to which

parents believed that the equality, equity, and need principles are followed in the municipalities where they are living.

There are different methods of payment for child care. It may therefore similarly be asked what people believe is a fair method of payment. Here people may find it fairer to pay for how much they use a service (fees) rather than that the payment is shared equally (taxes). Again, there may be individual differences. In the survey the two methods of payment were contrasted. Willingness to pay indicated on rating scales was for both methods expected to decrease with the absolute fairness difference, although more for the fairest method since fairness of how contributions are distributed should also be important.

Although we predict that a majority of the Swedish parents who were surveyed will believe that an equal distribution of quality of municipality child care and payment proportional to the degree of use are fair, there may be individual differences depending on different background factors. These background factors would then directly affect fairness and indirectly willingness to pay.

How much parents endorse equality of the distribution of the quality of child care may depend on the degree to which they share the political ideology behind the official equality principle endorsed by the Social Democrats. Political party preferences were measured in the survey. Social Democrats and perhaps Liberals were expected to be more in favour of equality than were Conservatives (Mitchell, Tetlock, Mellers, & Ordóñez, 1993). People who prefer a political ideology promoting equality among people, such as the Social Democrats, will probably also to a higher degree prefer payment by taxes compared to citizens supporting an ideology which does not focus as much on equality as on efficiency and equity, for example, the Conservatives, who to a larger extent probably will prefer payment by fees. Thus, different political

party preferences may also account for differences in preferences for method of payment. Indirect effects are expected on willingness to pay.

Higher educated people may also to a larger extent than lower educated people believe that equality is fair (Robinson & Bell, 1978). However, in a recent study of preferred principles of distributive justice (d'Anjou, Steijn, & Van Aarsen, 1995), neither this enlightenment thesis nor a gender hypothesis were found to have any effect. This was also true for income. Nevertheless, we hypothesized that education may have an effect on the degree to which equal distribution of quality of child care is perceived to be fair, and therefore an indirect effect on willingness to pay.

The survey was conducted in both small and large municipalities. Although it may be difficult to draw strict parallels from social dilemma research showing effects of group size employing small groups (Biel & Gärling, 1995; Van Lange et al., 1992), it seems reasonable to assume that norms have stronger influences in small than in large municipalities where people more often meet and get to learn each other. If so, distributive justice may be a stronger motive for paying for municipality child care. Thus, even though we did not expect effects of municipality size on what is perceived to be a fair distribution of the quality of child care, we expected direct effects on willingness to pay.

Another two factors may be expected to affect willingness to pay due to fairness considerations without however affecting what is perceived to be a fair distribution. Thus, these factors should have direct effects. As noted above, in experimental social dilemmas subjects with high endowments or profit rates believe it is fair that they contribute more than people with low endowments or profit rates (Biel & Gärling, 1995; Van Lange et al., 1992). On the basis of this recurrent finding in social dilemma research, we expected positive relationships between income

and willingness to pay and between how much parents use child care and willingness to pay.

Efficiency

A number of individual and situational factors increase cooperation in social dilemmas (Biel & Gärling, 1995; Van Lange et al., 1992). The reason why such factors have an effect is in many cases that subjects do not want to waste a resource or that they want to contribute to the creation of a resource accessible to everyone (Wilke, 1991). Despite several attempts (Caporael, Dawes, Orbell, & Van de Kragt, 1989), it is however not easy to completely discount the role of selfishness.

In the survey we measured parents' perceptions of the quality and efficiency of the child care in the municipalities where they are living. If efficiency is a motive for contributing to the public good of child care, we expected that willingness to pay would increase directly with the measures of perceived quality and efficiency. As in all social dilemmas, it may on the other hand be argued that such a relationship reflects self-interest. Similarly, we hypothesized that women would be more concerned than men about the efficiency of child care and therefore more willing to pay. However, since women in many cases also benefit more from the service, it is difficult to conclude that self-interest does not play a role.

Greed

In social dilemma research the influence of greed is indicated by the fact that changes in the payoff affect cooperation. Specifically, Komorita (1976) has shown that the incentive to cooperate in social dilemmas can be expressed as a ratio[7] between a group incentive for everyone to cooperate rather than for everyone to defect and the group incentive to cooperate plus the individual incentive to defect (K' index). Otherwise, effects of greed are inferred from the absence of effects of fairness and efficiency.

A direct effect of greed is indicated if willingness to pay for municipality child care is negatively correlated with degree of use and income. Furthermore, some people may prefer a certain method of payment, taxes, since those whose income is lower and who use child care less pay relatively more. Thus, if greed plays an important role, we expected those parents who have higher income to be more willing to pay by fees and less willing to pay by taxes whereas we expected those who use the service more to be less willing to pay by fees and more willing to pay by taxes.

Aim and Hypotheses

The present study thus aimed at investigating the degree to which parents' willingness to pay for municipality child care in Sweden is influenced by perceived fairness of how the quality of child care is distributed, by perceived fairness of method of payment, and several

[7] This is true if the choice of defection dominates the choice of cooperation and that the payoff functions are linear.

other factors such as gender, income, educational level, degree of use, political party preference, municipality size, and perceived quality and efficiency of the child care. The selection of these independent variables were guided by the GEF hypothesis (Wilke, 1991). According to this hypothesis, individuals who are not motivated to cooperate in a social dilemma because of greed may still cooperate if their greed is constrained by the desire to use the resource efficiently and to realize fairness. Although we assume that there will not be substantial individual differences in perceived distributive justice, some of the independent variables may have indirect effects through their effects on perceived justice of outcomes. This pertains to political party preferences and educational level. The remaining factors are assumed to have direct effects on willingness to pay since they are related to greed, efficiency, or other fairness considerations. The effect is in some cases assumed to be moderated by method of payment.

A large sample of parents was surveyed in municipalities of different sizes. Parents who responded indicated their preference for distribution of quality of child care which was equal, proportional to payment, or proportional to need. They also similarly indicated how they believed the quality of child care is actually distributed in the municipalities where they are living. The dependent variables were respondents' rated willingness to pay according to two different methods, either by taxes or by fees. A number of other questions were also asked to asses the other potential factors affecting willingness to pay.

Method

Questionnaire

The questionnaire used for the survey was developed based on a small number of face-to-face interviews and pilot questionnaires mailed to a sample of 50 respondents. In the final version of the questionnaire, questions were asked about gender, monthly disposable household income, educational level (no degree, high-school degree, or university degree), political party preference (indifference or expressed preference for one of eight major national parties), and degree of use of municipality child care (none, part-time, or full-time).

Questions were also asked about perceived efficiency and quality of the municipality child care. In the question about perceived quality, respondents were asked to mark on a 5-point scale how satisfied they were with the child care in their municipality. The end-points of the scale were defined as "Very satisfied" and "Very unsatisfied," respectively. The question about perceived efficiency requested a rating on a 4-point scale indicating degree of agreement with the statement "The municipality resources for child care are used in an efficient way."

Questions were furthermore asked about what respondents considered to be a fair distribution of the quality of child care in their municipalities and how they believed it was actually distributed. The three distributive principles of equality, need, and equity were described in the form of three statements: "All children should have equally good care" corresponding to the equality principle; "Younger children need

better care and should have better care than older children" corresponding to the need principle; and "If parents pay more, their children should have better care than if they pay less" corresponding to the equity principle. An additional three questions concerning how respondents believed that the quality of child care is actually distributed were the same except that the word "should" was left out. Each statement for the two types of questions was rated on a 5-point scale ranging from "Should never be true/Is never true" to "Should always be true/Is always true".

Willingness to pay for child care in their own municipality was tapped by the following statements[8]: "I am prepared to pay for child care even if my own child does not have to use it" (payment by taxes); "I am only prepared to pay for the child care my child uses" (payment by fees); "All should pay for child care but I am prepared to pay more if my child uses it" (combined taxes and fees). The degree of agreement was indicated on a 5-point scale ranging from "No, absolutely not" to "Yes, absolutely."

Procedure

The questionnaire was mailed to the sample of respondents along with a cover letter and a stamped return envelope. After about two weeks all members in the sample were sent a combined reminder and gratitude

[8] As indicated within parentheses, the different methods referred to taxes (requiring all to collectively pay equally much), fees, and a combination of taxes and fees. However, these words were never used in the questionnaire since their connotations may have unduly influences on the respondents. Payment by combined taxes and fees will not be analyzed further since the results for this dependent variable did not contribute anything in addition to the other two dependent variables.

letter. Approximately another four weeks later, the original package was mailed once again to those who had not responded by that time.

Respondents

2,784 households were sampled from five municipalities with from 6,174 to 433,811 residents (see Table 1 for a fuller description of each subsample). Usable questionnaires were obtained from 1,840 respondents, corresponding to an average response rate of 66.1%. Sixty-two percent of the respondents were women. The mean age was 34.8 years. About one-third had a university degree. Twenty-two percent had a monthly disposable household income above the national average for families with children (approximately $3,000).

Table 1. Descriptions of the five subsamples (municipalities).

		Municipality				
		A	B	C	D	E
Number of residents		6,174	23,854	36,289	68,924	44,200[9]
Sample size		254	386	417	415	368
Response rate (%)		66.1	64.3	69.5	69.2	61.3
Age	M	34.8	33.9	34.5	34.6	36.4
	SD	6.1	5.2	5.9	5.4	6.1
Gender (% men)		37.8	34.5	40.5	36.1	33.4
Monthly disposable income above $3,000 (%)		15.0	26.9	16.1	25.0	29.6
Education						
High-school degree (%)		62.2	53.4	57.3	59.5	32.3
University degree (%)		19.3	30.8	21.3	33.3	57.1

[9] Number of residents in the census tract which was sampled. The number in the municipality is 433,811.

Table 1. Continued.

		Municipality				
		A	B	C	D	E
Municipality child care use						
Part time (%)		44.9	12.7	32.6	8.0	34.0
Full time (%)		19.7	57.3	29.5	71.6	35.6
Perceived efficiency of child care (1-4)	M	2.9	2.7	2.8	2.7	2.5
	SD	0.57	0.70	0.66	0.68	0.76
Perceived quality of child care (1-5)	M	4.3	4.0	3.8	4.1	3.4
	SD	0.78	0.92	1.0	0.84	1.13
Preferred political party						
No preference (%)		12.2	16.3	15.3	11.3	14.4
Left party (%)		1.6	1.8	6.7	6.7	7.6
Social Democratic party (%)		35.4	35.5	37.6	51.8	23.9
Center party (%)		9.4	3.4	5.8	2.2	1.4
Liberal party (%)		2.4	2.6	3.6	6.7	9.0
Conservative party (%)		10.6	13.5	5.8	2.9	17.1
Christian Democratic party (%)		2.8	1.0	3.1	1.7	3.3
Green party (%)		3.5	3.6	2.6	5.3	7.1
New Democratic party (%)		2.0	2.6	2.9	0.5	0.8
Preferred distributive principle (1-5)						
Equality	M	4.79	4.74	4.78	4.83	4.70
	SD	0.53	0.75	0.69	0.53	0.70
Equity	M	1.13	1.20	1.15	1.10	1.22
	SD	0.56	0.70	0.63	0.48	0.66
Need	M	3.05	2.80	2.97	2.93	3.16
	SD	1.31	1.35	1.37	1.36	1.37
Perceived distributive principle (1-5)						
Equality	M	3.94	3.74	3.90	3.83	3.30
	SD	0.78	0.97	0.88	0.88	1.10
Equity	M	1.66	1.68	1.69	1.71	2.06
	SD	0.85	0.93	0.93	0.89	1.05
Need	M	3.17	3.0	3.15	3.09	3.13
	SD	0.94	0.98	0.97	0.97	0.87
Absolute difference between perceived and preferred distributive principle (0-4)						
Equality	M	0.93	1.13	0.98	1.07	1.47
	SD	0.82	0.99	0.90	0.90	1.12
Equity	M	0.64	0.77	0.68	0.71	1.0
	SD	0.89	1.03	0.96	0.93	1.03
Need	M	0.83	0.90	0.87	0.87	1.08
	SD	0.93	0.94	0.87	0.90	0.98
Preferred method of payment (1-5)						
Taxes	M	2.25	2.43	2.36	3.01	2.98
	SD	1.36	1.39	1.38	1.44	1.52
Fees	M	4.16	4.11	4.22	3.60	3.61
	SD	1.21	1.34	1.25	1.56	1.58
Combined taxes and fees	M	3.20	3.25	3.35	3.73	3.73
	SD	1.48	1.53	1.48	1.35	1.47

Results

Perceived Fairness of Distribution of Quality of Child Care

Equality was believed to be the fairest principle for distributing the quality of municipality child care (M = 4.75). As many as 94.5% indicated that the principle should be true always or almost always (5 or 4 on the 5-point scale). Next most preferred was the need principle (M = 2.91). In this case 32.3% indicated a higher value than the midpoint on the scale, 30.3% a lower value. The equity principle was the least preferred (M = 1.15). Only 1.9% believed it should be true always or almost always.

Separate multiple regression analyses were performed with the ratings of fairness of each of the distributive principles as dependent variables. The independent variables were municipality size (effect coded), gender (dummy coded), disposable income (7-point scale), degree of use of municipality child care (3-point scale), educational level (effect coded), perceived efficiency (4-point scale), perceived quality (5-point scale), and political party preferences (effect coded). First, the analyses showed that the fairness ratings were reliably affected by preference for political party. As compared to those who were indifferent, respondents preferring the Social Democrats rated the equality principle as fairer (beta = .114, t_{1288} = 2.92, p<.01) and the equity principle as less fair (beta = -.108, t_{1280} = -2.69, p<.01), those preferring the Liberals rated the need principle as fairer (beta = .134, t_{1250} = 2.69, p<.01), and those preferring the Conservatives rated equality as less fair

(beta = -.166, t_{1288} = -3.86, p<.01). Second, the analyses indicated that fairness of the need principle decreased with income (beta = -.068, t_{1250} = -2.31, p<.05), and that fairness of the equality principle increased with degree of use (beta = .098, t_{1288} = 3.27, p<.01). Third, women rated that the equality principle was fairer than did men (beta = .127, t_{1288} = 4.55, p<.05).

Willingness to Pay for Child Care

Willingness to pay by fees was rated as higher (M = 3.93) than willingness to pay by taxes (M = 2.63). Across all respondents, the ratings of willingness to pay by taxes were negatively correlated with the ratings of willingness to pay by fees (r = -.649, p<.01).

Separate hierarchical regression analyses were performed on the ratings of willingness to pay by taxes and by fees, respectively. The absolute differences between the ratings of how child care should be distributed and how it was believed to be distributed for each distributive principle were entered in the first step[10]. As reported in Table 2, in the analysis of willingness to pay by taxes the beta coefficient for the need principle was significant. The negative sign indicated that willingness to pay by taxes increased when the difference decreased. However, only 0.6% of the variance was accounted for. In the parallel analysis on payment by fees, the beta coefficient for the absolute difference of the equality principle reached significance. The difference

[10] Results from separate analyses for perceived actual distributions above or below preferred distributions did not yield different results. Thus, it did not matter whether respondents thought that the existing policy embraced too much or too little of the preferred policy.

accounted for 1.0% of the variance. The negative sign indicated that willingness to pay by fees increased when the difference decreased.

In the second step, the same independent variables as in the analyses of the ratings of fairness of the distributive principles were entered. Several of these variables significantly affected willingness to pay (Table 2). As should be expected from the negative correlation between willingness to pay by fees and taxes, the beta coefficients had different signs for the two methods of payments. With a few exceptions, when one was significant the other was also significant.

Educational level had the strongest effect on both willingness to pay by taxes and by fees. Respondents with a university degree were more willing to pay by taxes than respondents without a degree. However, they were less willing to pay by fees. Respondents who used municipality child care more were more willing to pay by taxes than those who used it less but less willing to pay by fees. With the exception for the next largest municipality, willingness to pay by taxes was less in the smaller municipalities than in the largest. Willingness to pay by fees was higher in smaller municipalities than in the largest, again with the exception for the next largest municipality. A higher disposable income increased willingness to pay by taxes and decreased willingness to pay by fees. A significant gender difference indicated that women were more willing to pay by fees than men. Preference for the Conservative political party increased willingness to pay by fees and decreased willingness to pay by taxes, whereas preference for the socialist or liberal political parties increased willingness to pay by taxes and decreased willingness to pay by fees.

Table 2. Summary of hierarchical regression analyses of payment by taxes and payment by fees.

	Payment by taxes			Payment by fees		
Independent variable	r	beta	t	r	beta	t
Step 1						
Absolute difference equality	.051*	.052	1.94+	-.084***	-.100	-3.71***
Absolute difference equity	.058*	.051	1.92+	-.048*	-.049	-1.82+
Absolute difference need	-.055*	-.078	-2.90**	.025	.041	1.51
R^2 = .011, $F_{(3, 1204)}$ = 4.44, p<.004 (Payment by taxes)						
R^2 = .013, $F_{(3, 1201)}$ = 5.23, p<.001 (Payment by fees)						
Step 2						
Municipality size[11]						
A vs. E	.144***	.084	3.15**	-.116***	-.049	-1.81+
B vs. E	.120***	.156	5.85***	-.112***	-.117	-4.31***
C vs. E	.136***	.050	1.88+	-.139***	-.064	-2.37*
D vs. E	-.018	-.095	-3.57***	.011	.082	3.04**
Degree of municipality child care use	.160***	.154	5.77***	-.134***	-.123	-4.54***
Perceived quality	.018	.014	0.52	-.019	-.026	-0.98
Perceived efficiency	.009	.003	0.12	-.024	-.028	-1.04
Disposable income	.131***	.113	4.22***	-.107***	-.116	-4.29***
Gender (men vs. women)	-.062**	-.016	-0.60	.080***	.068	2.50*
Degree of education vs. lower education						
High-school degree	.007	-.006	-0.21	.009	.023	0.85
University degree	.229***	.214	8.01***	-.219***	-.195	-7.20***
Political party preference vs. no preference						
Left party	.123***	.170	6.36***	-.116***	-.187	-6.91***
Social Democratic party	.039	.059	2.22*	.000	.010	0.38
Center party	.043+	.044	1.66+	-.032	-.027	-0.98
Liberal party	.107***	.103	3.85***	-.092***	-.119	-4.40***
Conservative party	.006	-.092	-3.46***	.004	.092	3.42***
Christian Democratic party	.046+	-.115	-4.32***	-.036	.100	3.70***
Green party	.106***	.143	5.35***	-.108***	-.167	-6.16***
New Democratic party	.039	-.069	-2.57**	-.039	-.008	-0.29
ΔR^2 = .146, $F_{(19, 1187)}$ = 10.76, p<.001 (Payment by taxes)						
ΔR^2 = .124, $F_{(19, 1184)}$ = 8.93, p<.001 (Payment by fees)						
R^2_{adj} = .141, $F_{(22, 1184)}$ = 9.99, p<.001 (Payment by taxes)						
R^2_{adj} = .121, $F_{(22, 1181)}$ = 8.52, p<.001 (Payment by fees)						
+ p<.10						
* p<.05						
** p<.01						
*** p<.001						

[11] A to E correspond to the order from the smallest to the largest municipality.

Discussion

Consistent with the results of previous experimental research (Allison & Messick, 1990; Harris & Joyce, 1980) and expressed opinions by authorities and others in Sweden, an equal distribution of the quality of municipality child care was perceived to be fairer than a distribution proportional to need or payment. As many as 94.5% of all respondents believed that this principle should apply always or almost always. The corresponding figures for need and equity was 32.3% and 1.9%, respectively. Yet, there were some individual differences which were mainly accounted for by preference for political party. As expected, preference for the Social Democratic party which strongly endorses equality increased perceived fairness of the equality principle. It is also interesting to note that the opinions differed concerning the need principle. This principle is clearly salient in the case of child care and is in conflict with the equality principle since both cannot be applied simultaneously. Perhaps respondents took their own circumstances in consideration when rating how fair they consider the need principle, but not as much when rating how fair they considered the equality and equity principles. If so, this is in line with suggestions made by Shepelak and Alwin (1986) that individuals base their considerations of fair income for themselves primarily on need, while applying different principles to others.

In support of the generalizability of the GEF hypothesis (Wilke, 1991), the results furthermore showed that the absolute difference between the degree to which the principle of distributing the quality of

child care is perceived to be fair and the degree to which it is perceived to be followed decreased willingness to pay. However, only less than 1% of the variance in the ratings of willingness to pay was accounted for. The supporting results were furthermore confined to the need principle when willingness to pay by taxes was rated, to the equality principle when willingness to pay by fees was rated. A possible interpretation is that there need to be larger differences between what is fair and what is prevailing for people to judge a policy as unfair.

Method of payment seemed to have a strong effect on willingness to pay. As expected, willingness to pay increased when payment was by fees (only paying for own child's use) rather than by taxes (paying for all children's use). However, this difference was modified by educational level, degree of use, municipality size, income, gender, and preference for socialist/liberal political parties. In fact, except for gender all these variables increased willingness to pay by taxes and decreased willingness to pay by fees.

The negative correlation between willingness to pay by taxes and by fees was not expected. A possible explanation is that respondents perceived it to be fair that a social service provided by the municipality is paid for collectively. If so, willingness to pay by taxes may indicate how willing the respondents were to contribute to the public good. In addition to fairness of the distribution of quality of child care, the results indicated that there were direct effects on willingness to pay by taxes. These direct effects accounted for 15% of the variance. As expected on the basis of experimental social dilemma research (Biel & Gärling, 1995; Van Lange et al., 1992), income and degree of use increased willingness to pay by taxes. A problem of interpretation arises however in the latter case when it is realized that for respondents who use more child care,

paying by taxes may be more profitable than paying by fees. Thus, that these respondents were more willing to pay by taxes may reflect greed.

Willingness to pay by taxes tended to increase rather than decrease with municipality size. This lack of an expected negative relationship may suggest that previous results from social dilemma research on small groups (e.g., Hamburger et al., 1975; Komorita & Lapworth, 1982; Olson, 1965) are not generalizable to municipality size. Perhaps residents of larger municipalities depend more on social services than do residents of smaller municipalities. They may therefore be more willing to pay because of their larger interest in the service.

Another factor which strongly affected willingness to pay was educational level. Since in agreement with previous results (d'Anjou et al., 1995) no effect of educational level was found on the ratings of fairness of the distribution of the quality of child care, higher educated respondents were perhaps not more willing to pay because of their concern about justice of the distribution of the outcomes. However, since higher educated may lose more if municipality child care is not available, they may be more interested in preserving the service and therefore more willing to pay.

Political party differences were both related to differences in perceived fairness and willingness to pay. Thus, in addition to indirect effects there were direct effects on willingness to pay. The latter may reflect that collective payment is preferred by respondents expressing a preference for the socialist/liberal parties and that payment by fee is preferred by respondents expressing a preference for the Conservative party.

In summary, almost all respondents believed that the quality of child care should be distributed equally. This may come as no surprise since child care in Sweden is provided by the municipalities as a collective or

public good which everyone should have equal access to. Thus, like in many social dilemma experiments (Biel & Gärling, 1995; Van Lange et al., 1992), the dilemma is in fact symmetrical with regard to the outcomes. In future studies it would be interesting to investigate how willingness to pay is affected by fairness in asymmetrical real-life social dilemmas where equality is not the endorsed principle of fairness. Another interesting, related question is whether privatization of child care would lead to a change of endorsed principle of fairness, for instance, that it is fair that quality is proportional to payment.

References

Allison, S. T., & Messick, D. M. (1990). Social decision heuristics in the use of shared resources. *Journal of Behavioral Decision Making, 3,* 195-204.

Biel, A., & Gärling, T. (1995). The role of uncertainty in resource dilemmas. *Journal of Environmental Psychology, 15,* 221-233.

Brewer, M. B., & Kramer, R. M. (1986). Choice behavior in social dilemmas: Effects of social identity, group size, and decision framing. *Journal of Personality and Social Psychology, 50,* 543-549.

Caporael, L. R., Dawes, R. M., Orbell, J. M., & Van de Kragt, A. J. (1989). Selfishness examined: Cooperation in the absence of egoistic incentives. *Behavioral and Brain Sciences, 12,* 683-739.

d'Anjou, L., Steijn, A., & Van Aarsen, D. (1995). Social position, ideology, and distributive justice. *Social Justice Research, 8,* 351-384.

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31,* 169-193.

Deutsch, M. (1975). Equity, equality, and need: What determines which value will be used as the basis for distributive justice? *Journal of Social Issues, 31*, 137-149.

Hamburger, H., Guyer, M., & Fox, J. (1975). Group size and cooperation. *Journal of Conflict Resolution, 19*, 503-531.

Harris, R. J., & Joyce, M. A. (1980). What's fair? It depends on how you phrase the question. *Journal of Personality and Social Psychology, 38*, 165-179.

Joireman, J. A., Kuhlman, D. M., & Okuda, H. (1994). Fairness judgements in an asymmetric public goods dilemma. In U. Shulz, W. Albers, & U. Müller (Eds.), *Social dilemmas and cooperation* (pp. 99-116). Berlin: Springer-Verlag.

Kerr, N. L. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology, 45*, 819-828.

Komorita, S. S. (1976). A model of the N-person dilemma-type game. *Journal of Experimental Social Psychology, 12*, 357-373.

Komorita, S. S., & Lapworth, C. W. (1982). Cooperative choice among individuals versus groups in an *N*-person dilemma situation. *Journal of Personality and Social Psychology, 42*, 487-496.

Komorita, S. S., & Parks, C. D. (1995). Interpersonal relations: Mixed-motive interaction. *Annual Review of Psychology, 46*, 183-207.

Kramer, R. M., & Brewer, M. B. (1984). Effects of group identity on resource use in a simulated commons dilemma. *Journal of Personality and Social Psychology, 46*, 1044-1057.

Kuhlman, D., & Marshello, A. (1975). Individual differences in game motivation as moderators of preprogrammed strategy effects in prisoner's dilemma. *Journal of Personality and Social Psychology, 32*, 922-931.

Lamm, H., & Schwinger, T. (1980). Norms concerning distributive justice: Are needs taken into consideration in allocation decisions? *Social Psychology Quarterly, 43*, 425-429.

Lamm, H., & Schwinger, T. (1983). Need consideration in allocation decisions: Is it just? *Journal of Social Psychology, 119*, 205-209.

Martin, J., & Harder, J. W. (1994). Bread and roses: Justice and the distribution of financial and socioemotional rewards in organizations. *Social Justice Research, 7*, 241-264.

Marwell, G., & Ames, R. E. (1979). Experiments on provision of public goods. I. Resources, interest, group size, and the free-rider problem. *American Journal of Sociology, 84*, 1335-1360.

Meeker, B. F., & Elliott, G. C. (1995). Equality and differentiation: Effects of group structure and allocations. *Social Justice Research, 8*, 263-284.

Messick, D. M., & Brewer, M. B. (1983). Solving social dilemmas: A review. In L. Wheeler, & P. Shaver (Eds.), *Review of personality and social psychology*, (Vol. 4, pp. 11-44). Beverly Hills: Sage.

Messick, D. M., & Schell, T. (1992). Evidence for an equality heuristic in social decision making. *Acta Psychologica, 80*, 311-323.

Mitchell, G., Tetlock, P. E., Mellers, B. A., & Ordóñez, L. D. (1993). Judgments of social justice: Compromises between equality and efficiency. *Journal of Personality and Social Psychology, 65*, 629-639.

Olson, M. (1965). *The logic of collective action.* Cambridge Mass., Harvard University Press.

Oppewal, H., & Tougareva, E. (1992). A three-person ultimatum game to investigate effects of differences in need, sharing rules and observability on bargaining behaviour. *Journal of Economic Psychology, 13*, 203-213.

Orbell, J. M., Van de Kragt, A. J. C., & Dawes, R. M. (1988). Explaining discussion-induced cooperation. *Journal of Personality and Social Psychology, 54*, 811-819.

Rapoport, A. (1988). Provision of step-level goods: Effects of inequality in resources. *Journal of Personality and Social Psychology, 54*, 432-440.

Rapoport, A., Budescu, D. V., Suleiman, R., & Weg, E. (1992). Social dilemmas with uniformly distributed resources. In W. B. G. Liebrand, D. M. Messick, & H. A. M. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings*. Oxford: Pergamon Press.

Rapoport, A., & Suleiman, R. (1993). Incremental contribution in step-level public goods games with asymmetric players. *Organizational Behavior and Human Decision Processes, 55*, 171-194.

Robinson, R. V., & Bell, W. (1978). Equality, success, and social justice in England and the United States. *American Sociological Review, 43*, 125-143.

Rutte, C. G., Wilke, H. A. M., & Messick, D. (1987). Scarcity or abundance caused by people or the environment as determinants of behavior in the resource dilemma. *Journal of Experimental Social Psychology, 23*, 208-216.

Samuelson, C. S., Messick, D. M., Wilke, H. A. M., & Rutte, C. G. (1986). Individual restraint and structural change as a solution to social dilemmas. In H. Wilke, D. Messick, & C. Rutte (Eds.), *Experimental social dilemmas* (pp. 29-53). Frankfurt: Verlag Peter Lang.

Schwinger, T., & Lamm, H. (1981). Justice norms in allocation decisions: Need consideration as a function of resource adequacy for complete need satisfaction, recipients' contributions, and recipients' interpersonal attraction. *Social Behavior and Personality, 9*, 235-241.

Shepelak, N. J., & Alwin, D. F. (1986). Beliefs about inequality and perceptions of distributive justice. *American Sociological Review, 51*, 30-46.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel, & W. G. Austin (Eds.), *Psychology of intergroup relations* (2nd ed., pp. 7-24). Chicago: Nelson-Hall.

Tyler, T., & Dawes, R. M. (1993). Fairness in groups: Comparing the self-interest and social identity perspectives. In B. A. Mellers, & J. Baron (Eds.), *Psychological perspectives on justice: Theory and applications* (pp. 87-108). New York: Cambridge University Press.

Törnblom, K. Y., & Foa, U. G. (1983). Choice of distribution principle: Crosscultural evidence on the effects of resources. *Acta Sociologica, 26*, 161-173.

Van Dijk, E., & Grodzka, M. (1992). The influence of endowments asymmetry and information level on the contribution to a public step good. *Journal of Economic Psychology, 13*, 329-342.

Van Dijk, E., & Wilke, H. A. M. (1993). Differential interests, equity, and public good provision. *Journal of Experimental Social Psychology, 29*, 1-16.

Van Lange, P. A. M., & Liebrand, W. B. G. (1989). On perceiving morality and potency: Social values and the effects of person perception in a give-some dilemma. *European Journal of Personality, 3*, 209-225.

Van Lange, P. A. M., Liebrand, W. B. G., Messick, D. M., & Wilke, H. A. M. (1992). Introduction and literature review. In W. Liebrand, D. M. Messick, & H. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings* (pp. 3-28). Oxford: Pergamon Press.

Wilke, H. A. M. (1991). Greed, efficiency and fairness in resource management situations. In W. Stroebe, & M. Hewstone (Eds.), *European review of social psychology* (Vol. 2, pp. 165-187). New York: Wiley & Sons.

Wilke, H. A. M., Liebrand, W. B. G., Lotgerink, B., & Buurma, B. (1986). Equity and individual preferences in a MDG. *European Journal of Social Psychology, 16*, 131-148.

Wit, A., Wilke, H. A. M., & Oppewal, H. (1992). Fairness in asymmetric social dilemmas. In W. B. G. Liebrand, D. M. Messick, & H. A. M. Wilke (Eds.), *Social Dilemmas: Theoretical Issues and Research Findings* (pp. 183-197). Oxford: Pergamon Press.

Appendix II

Distributive Justice and Willingness to Pay for Municipality Child Care: Do Results for Hypothetical Societies Generalize?

Daniel Eek, Anders Biel, and Tommy Gärling

Abstract

Public-goods dilemmas are characterized by conflicts between self-interest and the welfare of a group or society at large. Research has identified several factors that enhance cooperation in such dilemmas. However, less is known about how concern for distributive justice affects willingness to contribute in asymmetric public-goods dilemmas. To test the hypothesis that contributions to a common resource is related to perceived fairness, experiments were performed to investigate willingness to pay to the social service of child care in hypothetical societies. Experiment 1 aimed at replicating a previous survey study (Biel et al., in press). Experiments 2 and 3 were extensions. In all three experiments subjects were asked to indicate how fair they considered different distributions of the quality of child care provided by their municipality. These distributions corresponded to the principles equality, equity, and need. University students (32, 48, and 32 in the three experiments, respectively) served as subjects. Ratings of perceived fairness were positively related to willingness to pay. Other factors also positively related to willingness to pay included ability to pay, personal need, expected payment from others, and the number of households who had to contribute in order to maintain the quality. Furthermore, decreasing municipality size increased willingness to pay.

Keywords: Distributive justice, public-goods dilemmas, willingness to pay.

Social dilemmas refer to a conflict between an individual's own interest and the interest of the common good (Dawes, 1980). The conflict arises because the individual has to make one of two choices where one favours self-interest and the other the common interest. Research on social dilemmas has mainly concentrated on one of two kinds of dilemmas: Resource dilemmas and public-goods dilemmas, respectively. In a resource dilemma people must restrain themselves not to overuse or pollute a common resource. Public-goods dilemmas mimic situations in which people are asked to contribute to collective facilities to which everyone has free access. Provided that a minimum set of people contribute, a noncontributor will still benefit from using the facility.

To solve a social dilemma requires that a certain amount of people cooperate, that is, make a choice in favour of the collective interest. Such a choice always results in a smaller individual gain compared to the gain from a choice out of self interest. This follows from the two properties that according to Dawes (1980) characterize a social dilemma: (1) One's own gain always becomes larger by choosing to act according to one's own interest, disregarding what other people do, but (2) all group members would be better off if they all cooperated and supported the common interest than if they all pursued their individual interests.

Several situational and individual factors that may enhance cooperation in social dilemmas have been identified (for an overview, see Van Lange, Liebrand, Messick, & Wilke, 1992). However, the importance of conceptions of fairness on cooperation in social dilemmas has drawn little attention. When a common resource is to be allocated, there are at least three discernible principles of fair distribution: (1) Equality, where all receive the same; (2) Equity, where the distribution is proportional to the recipients' individual contribution to the resource that is to be allocated; and (3) Need, where those mostly in need receive

the most (Deutsch, 1975). It is assumed that which of these principles that are applied is related to the collective goals. Thus, equality is preferred in order to sustain mutual respect when social relations are in focus. Equity is linked to economic production and efficiency. Finally, need is the favoured principle when personal development and well-being are the primary goals.

Little systematic research has tested the relationships between principles of fairness and collective goals assumed by Deutsch (Tyler & Dawes, 1993). However, when Wilke (1991) proposed the GEF hypothesis to account for cooperation in resource dilemmas, he explicitly recognized the importance of fairness. The hypothesis states that although individuals are greedy (G), their greed is constrained by two other motives: the desire to use the resource efficiently (E) and the desire to realize fairness (F). Greed refers to the fact that individuals try to maximize their own outcomes. However, overharvesting leads to exploitation of the resource. Therefore, greed is constrained by the desire to preserve the resource efficiently. Furthermore, there is also a desire to obtain fairness for all group members, usually referring to equal final outcomes for all individuals.

Earlier studies have shown that in symmetrical situations where effort and/or gain are the same for all, people prefer a distribution based on equality (Rapoport, Budescu, Suleiman, & Weg, 1992; Rutte, Wilke, & Messick, 1987). This seems also to be the case when no information about wealth or benefits is given (Van Dijk & Grodzka, 1992). As suggested by Allison and Messick (1990), equality is a natural principle or heuristic to apply. However, Van Dijk (1993) questioned the assumption by Allison and Messick that equality is applied because of simplicity. Rather, in line with the GEF hypothesis, the equality principle was assumed to apply because it provided fairness among group members (Van Dijk, 1993).

The concern for fairness also seemed to overrule an asymmetry where input and/or output differed between participants. Albeit group members could harvest different amounts from the resource, those with the possibility to harvest more did not do that but harvested approximately as much as the less advantageous.

The GEF hypothesis may extend to public-goods dilemmas. Greed in a public-goods dilemma is to contribute as little as possible to a common resource. In a public-goods dilemma efficiency is to contribute the amount which is required to create or maintain a public good. In the GEF hypothesis fairness refers to equal final outcomes for all group members. In a public-goods-dilemma condition, Van Dijk (1993) showed that a proportionality rule was often used in that group members with twice as many endowments contributed twice as much as those with few endowments. Also, group members with larger interest in the good contributed more than group members with less interest. Hence, fairness according to the GEF hypothesis refers to a desire to adapt the harvests from a resource to provide all group members with equal final outcomes. However, fairness in a public-goods dilemma is for all group members to contribute the same proportion of their endowments and interests.

Earlier research supports the suggestion about the role of fairness in public-goods dilemmas. In this vein Biel, Eek, and Gärling (in press) found in a survey that when subjects were asked to rate distributions of the quality of resources for social services, equality was perceived as the fairest distributive principle while equity was perceived as unfair. However, when people know about asymmetries, they may switch to equity as a desirable principle for distributive justice (Messick & Schell, 1992; Wilke, Liebrand, Lotgerink, & Buurma, 1986; Van Dijk & Grodzka, 1992). An important proviso is whether the asymmetry is regarded as fair or not (Messick & Schell, 1992). For instance, if the asymmetry is due

to internal factors it is easier to turn from equality to equity than if the asymmetry is due to external factors.

In asymmetric public-goods dilemmas characterized by continuous contributions, those with large resources or high profit rates contribute more than those with small resources or low profit rates (Wit, Wilke, & Oppewal, 1992). Similarly, Rapoport (1988) and Rapoport and Suleiman (1993) reported that people with different endowments contributed the same proportion of their endowments, though individual differences appeared to exist. Some subjects adhered to an equity principle, whereas others did not. Biel et al. (in press) found that citizens with a higher income manifested a higher willingness to pay for child care than citizens with a lower income.

Interest in the resource has also been shown to lead to higher contributions. Marwell and Ames (1979), Wit et al. (1992), and Van Dijk (1993) found that subjects with high profit rates from a resource contributed more than subjects with low profit rates. Similarly, Biel et al. (in press) found that subjects with a high degree of utilization of child care were more willing to pay for child care than those who utilized the service less.

Another factor that has been shown to enhance cooperation in social dilemmas is group size (e.g., Hamburger, Guyer, & Fox, 1975; Komorita & Lapworth, 1982; Olson, 1965). Members of smaller groups cooperate more frequently than members of larger groups. Several factors may explain this effect: identifiability, social identity, perceived responsibility and efficacy, communication, and commitment. However, Biel et al. (in press) found that citizens in larger municipalities contributed more to the public good of child care than citizens in smaller municipalities. The explanation suggested was that citizens in larger municipalities in fact utilized the social service more frequently than citizens in smaller

municipalities, that they therefore were more dependent on the service, and consequently that they contributed more.

The present experiments investigate perceived fairness of distribution and willingness to contribute in asymmetric public-goods dilemmas. They constitute replications and extensions of the previous survey study (Biel et al., in press) where the main hypothesis was that willingness to contribute to a public good is related to the perceived fairness of the good's distribution. The design of the survey was replicated in an experimental setting by using the "hypothetical society" paradigm (Mitchell, Tetlock, Mellers, & Ordóñez, 1993). In addition to validate the interpretation of the results of the survey study, a successful experimental replication using hypothetical societies would increase trust in future investigations of the importance of fairness and other factors on willingness to pay.

Experiment 1

Experiment 1 investigated if willingness to pay for municipality child care is affected by subjects' perceived fairness of principles of distributing quality. The study was experimental using scenarios where municipality size, income, and personal need of child care were manipulated in order to achieve variations in perceived fairness of the distributive principles and thus in willingness to pay. Since subjects were presented with hypothetical societies, it was possible to define how the

quality of child care is distributed. Therefore, how fair the respondents perceived different ways of distributing the quality of child care was expected to be directly related to the dependent measure. In the survey study (Biel et al., in press) respondents were asked to answer questions about how much they preferred different distributions and to what extent they thought different distributions prevailed. The main hypothesis was that the discrepancy between preferred and perceived actual distribution would decrease willingness to pay. The results supported this main hypothesis, even though the relationship was weak. Employing the hypothetical-society paradigm may result in a stronger relationship between perceived fairness of distribution and willingness to pay. Since the distributions were given and subjects were asked to indicate how fair they considered the different distributions, the perceived fairness of distribution was expected to be more salient and thus more important for willingness to pay.

In line with the findings of Biel et al. (in press), income and personal need of child care were expected to be positively related to willingness to pay. Based on earlier research on cooperation in social dilemmas (e.g., Hamburger et al., 1975; Komorita & Lapworth, 1982; Olson, 1965), municipality size was hypothesized to be negatively related to willingness to pay.

Method

Material

In a booklet subjects were instructed to imagine that they were married and had a child in need of municipality child care. They were presented

with eight different scenarios, each described on a single page in the booklet. For each scenario, subjects were asked to decide how fair they perceived three distributions of the quality of child care, one for each of the principles equality, need, and equity: "All children have equally good care" corresponding to the equality principle; "Younger children need better care and have better care than older children" corresponding to the need principle; and "If parents pay more, their children have better care than if they pay less" corresponding to the equity principle. Each distribution was rated on a five-point scale ranging from "Not fair at all" to "Very fair". For each scenario, subjects were also asked to rate how willing they were to pay for child care if payment by taxes, payment by fees, or a combination thereof was used. Like in the survey study (Biel et al., in press), subjects responded to the following statements[12]: "I am prepared to pay for child care even if my own child does not have to use it" (payment by taxes); "I am only prepared to pay for the child care my child uses" (payment by fees); "All should pay for child care but I am prepared to pay more if my child uses it" (combined payment by taxes and fees)[13]. The response scale varied from "No, absolutely not", with a scale value of 1, to "Yes, absolutely" with a scale value of 5. Since payment by taxes and payment by fees were negatively correlated in Biel et al. (in press) and payment by taxes requires all to collectively pay equally much, payment by taxes was regarded as the main measure of willingness to pay to the public good.

[12] As indicated within parentheses, the different methods of payment referred to taxes (requiring all to collectively pay equally much), fees (payment directly determined by own utilization), and a combination thereof. However, these words were not used in the booklets since their connotations may have unduly influences on the subjects.

[13] The results for the combined payment by taxes and fees did not contribute anything in addition to the other two dependent variables and will therefore not be analyzed further.

There were three within-subject factors, each with two levels. The first factor was municipality size where subjects either lived in a big city with a low degree of social contacts or in a small municipality with a high degree of social contacts. The second factor was disposable household income with either an income above or below the average in their municipality. Finally, subjects either had a young child in great need of child care or an older child in little need.

Procedure

The booklet was administered in a class setting by a female experimenter. Subjects participated voluntarily without payment and were informed that their answers were anonymous. It took about 20 minutes to complete the tasks. After completion, subjects were debriefed.

Subjects

Thirty two undergraduate students of psychology served as subjects. They were 17 males with an average age of 25.1 years and 15 females with an average age of 25.3 years.

Results and Discussion

Perceived Fairness of Distribution

As in the survey study (Biel et al., in press), equality was overall the most preferred distributive principle (M = 4.2), followed by need (M = 3.9) and

equity (M = 1.8) (see Table 1). In regression analyses of the within-subject variance (21.1%, 15.5%, and 20.1% of the total variance in the ratings of perceived fairness of equality, need, and equity, respectively), R^2_{adj} corresponding to the dummy coded independent variables income, personal need of child care, municipality size, and their interactions were .006 (equality), $F<1$; .037 (need), $F_{(6,\ 186)} = 1.19$, $p>.25$, and .133 (equity), $F_{(6, 186)} = 4.75$, $p<.001$. Except for a significant effect of income on perceived fairness of the equity principle (beta = .16, $t_{210} = 2.50$, $p<.05$), no other effects reached significance. When subjects imagined that their income was above average, they perceived equity as fairer.

Table 1. Mean Ratings of Perceived Fairness of each Distributive Principle Related to Personal Need, Income, and Municipality Size.

	Low income		High income	
Municipality size	Low personal need	High personal need	Low personal need	High personal need
		Equality		
Small	4.16	4.25	4.19	4.16
Large	4.13	4.17	4.22	4.19
		Equity		
Small	1.63	1.56	1.94	2.06
Large	1.69	1.66	2.00	2.13
		Need		
Small	3.81	3.91	4.00	4.06
Large	3.78	3.97	3.81	3.88

Willingness to pay by taxes was rated as higher (M = 3.97) than willingness to pay by fees (M = 2.53). As in the survey study (Biel et al., in press), across all subjects the ratings of willingness to pay according to the two methods were negatively correlated (r = -.513, p<.01). Payment by taxes will therefore be regarded as the main measure of willingness to pay for the public good. Mean ratings of the two methods of payment for each level of the within-subject factors are presented in Table 2.

Table 2. Mean Ratings of Willingness to pay Related to Personal Need, Income, and Municipality Size.

	Low income		High income	
Municipality size	Low personal need	High personal need	Low personal need	High personal need
		Payment by taxes		
Small	3.63	3.81	4.34	4.25
Large	3.63	3.66	4.22	4.22
		Payment by fees		
Small	2.53	2.63	2.28	2.34
Large	2.84	2.91	2.31	2.41

Separate multiple regression analyses were performed on the mean willingness to pay by taxes and by fees, respectively. In the analysis of the mean willingness to pay by taxes with perceived fairness of the

equality, equity, and need principles as independent variables, an R^2_{adj} of .084, $F_{(3, 252)} = 8.78$, $p<.001$, was obtained. Perceived fairness of the need principle reached significance and increased willingness to pay by taxes (beta = .25, $t_{210} = 3.98$, $p<.001$). Perceived fairness of the equity principle was also significant and decreased willingness to pay by taxes (beta = -.21, $t_{210} = -3.06$, $p<.01$).

In a hierarchical regression analysis of the within-subject variance in willingness to pay by taxes (49.5% of the total variance), perceived fairness of the three distributive principles entered in the first step yielded an R^2_{adj} of .072, $F_{(3, 252)} = 3.67$, $p<.05$. Thus, perceived fairness was positively related to willingness to pay by taxes. The beta weight for the ratings of the need principle was significant (beta = .20, $t_{210} = 4.54$, $p<.001$). That willingness to pay by taxes for child care is affected by the perceived fairness of distribution was thus supported for the principle of need. The size of the effect was similar to that in Biel et al. (in press). In the next step, the dummy coded factors income, personal need, municipality size, and their interactions were entered. R^2_{adj} increased to .291, $F_{(7, 248)} = 9.55$, $p<.001$, corresponding to the increase. Income was significant (beta = .33, $t_{210} = 8.00$, $p<.001$) indicating more willingness to pay by taxes for a higher than for a lower income ($M = 4.26$ and $M = 3.68$, respectively). Perceived fairness of the need principle (beta = .19, $t_{210} = 4.49$, $p<.001$) was still significant and increased willingness to pay. Furthermore, perceived fairness of the equity principle significantly decreased willingness to pay by taxes (beta = -.14, $t_{210} = -2.15$, $p<.05$). Thus, when it is considered to be fair that children receive better care if their parents pay more, willingness to pay for others' utilization of child care declines. This effect also replicates the results in Biel et al. (in press).

In the analysis of the mean willingness to pay by fees with perceived fairness of the equality, equity, and need principles as independent

variables, R^2_{adj} was .112, $F_{(3, 252)} = 11.73$, $p<.001$. Only perceived fairness of the need principle reached significance and decreased willingness to pay by fees (beta = -.31, $t_{210} = -4.92$, $p<.001$). In a hierarchical regression analysis of the within-subject variance in willingness to pay by fees (20% of the total variance), perceived fairness of the distributive principles entered in the first step yielded an R^2_{adj} of .479, $F_{(3, 252)} = 39.56$, $p<.01$. Thus, perceived fairness was strongly related to willingness to pay by fees. The beta weights for the ratings of the need principle and the equality principle reached significance (beta = -.29, $t_{210} = -14.97$, $p<.001$ and beta = .07, $t_{210} = 3.09$, $p<.01$, respectively). Thus, perceived fairness of distribution according to the need principle decreased and perceived fairness of the equality principle increased willingness to pay by fees. In the next step, the dummy coded factors income, personal need, municipality size, and their interactions were entered. R^2_{adj} increased to .615, $F_{(7, 248)} = 11.01$, $p<.001$, corresponding to the increase. Again, income was significant (beta = -.14, $t_{210} = -7.43$, $p<.001$). As should be expected from the negative correlation between the two methods of payment, the effect of income indicated more willingness to pay by fees when income was low compared to when income was high ($M = 2.73$ and $M = 2.34$, respectively). Furthermore, municipality size and personal need of child care also had an effect on willingness to pay by fees (beta = .05, $t_{210} = 2.69$, $p<.01$ and beta = .04, $t_{210} = 2.04$, $p<.05$, respectively). Thus, willingness to pay by fees was higher in larger than in smaller municipalities ($M = 2.62$ and $M = 2.44$, respectively) and when personal need was high ($M = 2.57$) rather than low ($M = 2.49$). The interaction between income and municipality size was also significant (beta = -.06, $t_{210} = -3.10$, $p<.01$) and indicated that the effect of municipality size was stronger when income was low compared to high. The effects of perceived fairness of need and

equality were still significant (beta = -.29, t_{210} = -14.86, p<.001 and beta = .08, t_{210} = 3.65, p<.001, respectively).

In summary, the main results from Biel et al. (in press) concerning the effect of perceived distributive justice on willingness to pay for child care were replicated in that perceived fairness of the need principle increased willingness to pay by taxes and decreased willingness to pay by fees, perceived fairness of the equity principle decreased willingness to pay by taxes, and perceived fairness of the equality principle increased willingness to pay by fees. Furthermore, the effect of income was replicated in that a positive effect on willingness to pay by taxes and a negative effect on willingness to pay by fees were obtained. However, in the survey study willingness to pay by fees was rated as more preferable than willingness to pay by taxes. The opposite pattern was found in the present experiment. Furthermore, personal need of child care was not related to willingness to pay by taxes while in the survey study degree of utilization increased willingness to pay by taxes. Besides, contradicting the results from the survey study, personal need increased willingness to pay by fees. It may be the case that the manipulation of personal need in the present study did not correspond to degree of utilization in the way which was hypothesized. Even though subjects were asked to imagine that they sometimes had low and sometimes high personal need of child care, it may not be the same as different degrees of utilization.

The effect of municipality size on willingness to pay by fees was the opposite to that found in the survey. Thus, when subjects imagined that they lived in a smaller municipality, they were less willing to pay by fees compared to when they imagined that they lived in a larger municipality. This may be explained by the assumption that people are more likely to encounter a feeling of a social identity in smaller rather

than in larger municipalities. As a result, they are reluctant only to pay for own utilization.

In accordance with the results in Biel et al. (in press), it was thus found that willingness to pay for a public good like municipality child care is affected by the perceived fairness of how the quality of the resource is distributed. The fairer the distribution was perceived, the more willing to pay the respondents were. However, across respondents perceived fairness did not account for more than about ten percent of the variance. On the other hand, substantially more of the within-subject variance was accounted for by perceived fairness.

Experiment 2

Experiment 1 showed that perceived fairness of distribution explained some of the variance in willingness to pay for child care. Although the effect in Experiment 1 was larger than in the survey study (Biel et al., in press), perceived fairness still only explained a minor portion of the variance in willingness to pay. In the two following studies, willingness to pay was measured in a different manner. Rather than asking subjects to consider three different ways of payment corresponding to either payment by taxes, payment by fees, or a combination thereof, subjects were asked to rate their willingness to pay on a single scale. This kind of measurement procedure was assumed to tap willingness to pay more

directly, and therefore be more sensitive to the effects of perceived distributive justice.

As predicted, Experiment 1 showed that subjects were more willing to pay collectively (payment by taxes) when asked to imagine that they had an income above the average in the municipality than when the income was below the average. The same hypothesis is tested in Experiment 2. In contrast to Experiment 1, income was manipulated as a between-subjects factor since it may still be suspected that the subjects have difficulties in changing their reference.

Contrary to the survey study, personal need of child care did not show any effect on willingness to pay collectively in Experiment 1. In Experiment 2, personal need was therefore manipulated as a between-subjects factor for the same reason as the manipulation of income. More importantly, the manipulation was stronger in that half of the subjects were asked to imagine that they had a child in need of child care and half of the subjects to imagine that they did not have a child and consequently did not utilize the social service of child care. This manipulation was assumed to be a better manipulation of the variable degree of utilization in the survey study and therefore result in a positive correlation between willingness to pay and personal need.

In Biel et al. (in press) the results showed, contrary to expectation, a higher willingness to pay collectively in larger municipalities. However, in Experiment 1, subjects showed less willingness to pay only for own utilization (payment by fees) in smaller than in larger municipalities. This latter result is in accordance with research on social dilemmas, reporting a higher degree of cooperation in small as compared to larger groups (e.g., Hamburger et al., 1975; Komorita & Lapworth, 1982; Olson, 1965). Municipality size was again manipulated in Experiment 2 since clarification of the issue is desirable. It was assumed that when subjects

are asked to imagine that they live in a small rather than in a large municipality, they will be more willing to pay for child care.

In correspondence with the GEF hypothesis (Wilke, 1991) it is predicted that even though subjects would be better off by not contributing to the public good, they are inclined to do that. This is because greed is constrained by a desire to maintain the quality of the good, and thus to contribute so that the efficiency of the resource will be maintained. Furthermore, since fairness has been found to be a key factor, it is predicted that greed will also be constrained by perceived fairness and to affect willingness to contribute. If the interest in the resource is high, and the ability to contribute is high as well, greed will be constrained even more. Earlier research has shown that it is considered as fair that those with higher interest in the resource and higher ability to pay should pay more (Van Dijk, 1993). To provide an even stronger test of the GEF hypothesis, subjects were instructed that the public good had a step-level character, thus the quality and efficiency of the resource would be considerably reduced if the number of contributors was not large enough. This instruction also evokes the properties of a social dilemma more directly.

Method

Design

Four groups of subjects were used in an orthogonal factorial design where income (high vs. low) and personal need (need vs. no need)

varied as between-subjects factors. Two within-subject factors were municipality size (large vs. small) and distributive principle (equality vs. equity vs. need). There were two measured variables, perceived fairness and willingness to pay. Willingness to pay is the main dependent variable and perceived fairness is an independent variable.

Material

In a booklet administered to all subjects, six hypothetical municipalities were described. Three of the municipalities were described as large cities with a low degree of social contacts. The other three municipalities were described as small towns with a high degree of social contacts. Resources for the quality of child care was said to be distributed according to equality, need, and equity, respectively. The definitions of the principles were the same as in Experiment 1.

Subjects were asked to imagine that they had an income above or below average in the municipality. Furthermore, they were asked to imagine that they either had a child and therefore a personal need of child care or not a child and consequently no personal need of child care.

For each of the six municipalities, described on a single page in the booklet, subjects were asked to rate on a graphic scale how fair they considered the distribution of the quality of child care. The scale varied from 0 (Not fair at all) to 100 (Very fair). Then they indicated how likely they were to voluntarily pay a monthly fee of SEK 200 (approximately $26) so that the child care would maintain its quality. Subjects were told that if 50% of the households in the municipality paid this fee, the quality of the child care would not be affected. However, if less than 50% of the households paid, considerable reductions in the quality of child care

would be unavoidable due to the bad finances of the municipality, and the quality of the child care therefore decrease. This scale also varied from 0 (Not likely at all) to 100 (Very likely).

Procedure

Subjects were recruited from an available pool. Through telephone calls they were asked to participate in a study that investigated how people perceive the quality of social service and how the service should be financed. Subjects were informed that they would be paid the equivalent of $6.50. All subjects were guaranteed anonymity. On arrival at the laboratory, they were seated in a room and answered the booklet individually in groups of two to four persons. They were monitored by a male experimenter. Answering the booklet took about 20 minutes. After completion subjects were paid and debriefed.

Subjects

Forty eight undergraduate students of psychology served as subjects, 28 women and 20 men, with an average age of 27.8 and 27.0 years, respectively. Subjects were randomly assigned to four groups with 7 females and 5 males in each.

Results and Discussion

Perceived Fairness of Distribution

In a 2 (high income vs. low income) by 2 (personal need vs. no personal need) by 2 (large municipality vs. small municipality) by 3 (equality vs. equity vs. need distributive principle) ANOVA with repeated measures on the last two factors, there was only a significant main effect of distributive principle, $F_{(2, 88)} = 105.59$, $p<.001$. In accordance with both the results of the survey (Biel et al., in press) and Experiment 1, as well as of other studies (e.g., Allison, McQueen, & Schaerfl, 1992; Allison & Messick, 1990; Harris & Joyce, 1980), equality was perceived as the fairest principle of distribution ($M = 83.9$), followed by need ($M = 61.6$) and equity ($M = 16.4$).

Willingness to Pay

Mean ratings of willingness to pay are presented in Table 3. A 2 (high income vs. low income) by 2 (personal need vs. no personal need) by 2 (large municipality vs. small municipality) by 3 (equality vs. equity vs. need distributive principle) ANOVA with repeated measures on the last two factors was performed. First, the analysis revealed significant main effects of the between-subjects factors income, $F_{(1, 44)} = 10.63$, $p<.01$, and personal need, $F_{(1, 44)} = 10.81$, $p<.01$. In line with earlier research showing that ability to cooperate (e.g., Rapoport, 1988; Rapoport & Suleiman, 1993) and interest in cooperation (e.g., Marwell & Ames, 1979; Wit et al., 1992) enhance cooperation in social dilemmas, both income and personal

need increased willingness to pay. Second, the analysis indicated a significant main effect of municipality size, $F_{(1, 44)} = 15.09$, $p<.001$. This effect suggests that when subjects imagined that they lived in small municipalities they were more willing to pay compared to when they imagined that they lived in large municipalities. The result supports the hypothesis based on earlier research (e.g., Hamburger et al., 1975; Komorita & Lapworth, 1982; Olson, 1965) showing that cooperation in social dilemmas is negatively related to group size. Third, the analysis revealed significant effects of the distributive principles, $F_{(2, 88)} = 7.79$, $p<.001$. As may be seen in Table 3, subjects were more willing to pay when the quality of the public good was distributed according to the equality principle ($M = 69.6$), somewhat less when it was distributed according to the need principle ($M = 66.6$), and least when it was distributed according to the equity principle ($M = 57.6$). Furthermore, the income by distributive principle interaction, $F_{(2, 88)} = 4.83$, $p<.01$ and the personal need by distributive principle interaction, $F_{(2, 88)} = 7.15$, $p<.001$ reached significance.

Table 3. Mean Ratings of Willingness to Pay Related to Distributive Principle, Personal Need, Income, and Municipality Size.

	Distributive principle					
	Equality		Equity		Need	
Municipality size	No personal need	Personal need	No personal need	Personal need	No personal need	Personal need
			Low income			
Small	59.3	74.0	19.8	67.7	48.1	73.9
Large	48.5	64.5	15.7	63.0	48.2	67.3
			High income			
Small	76.0	86.8	62.8	85.4	75.1	80.7
Large	67.5	80.3	62.6	84.1	65.4	73.9

To interpret the two-way interactions and to test the hypothesis that the effect of distributive principle on willingness to pay can be explained by perceived fairness, willingness to pay when each distributive principle applied was contrasted and used as dependent variables in separate hierarchical regression analyses with income, personal need, their interaction, and subjects' ratings of perceived fairness as independent variables. Since the survey study (Biel et al., in press) showed that an equal distribution of the quality of child care was perceived as fairest and earlier research has shown that equality is the distributive principle that most often is preferred in social dilemmas (e.g., Allison & Messick, 1990), in the first regression analysis the dependent variable contrasted subjects' willingness to pay when the equality principle applied with the

means of subjects' willingness to pay when the equity and the need principles applied. When the dummy coded variables income and personal need of child care and their interaction were entered in the first step, an R^2_{adj} of .123, $F_{(3, 44)} = 3.19$, $p<.05$, was obtained. The constant effect was significant, $t = 2.95$, $p<.01$, indicating that subjects were overall more willing to pay when the equality principle applied compared to the equity and the need principles. Personal need of child care was also significant (beta = -.30, $t_{44} = -2.20$, $p<.05$), suggesting that subjects who were not in personal need of child care, as compared to those in personal need of child care, were more willing to pay when equality was the applied principle than when the equity and the need principles were. In the next step subjects' ratings of perceived fairness of equality compared to equity and need were entered. R^2_{adj} then increased to .181, $F_{(1, 43)} = 4.10$, $p<.05$, corresponding to the increase. Perceived fairness of distribution (beta = .28, $t_{43} = 2.03$, $p<.05$) eliminated the constant effect and was the only effect that reached significance. Thus, the effect of distributive principle (equality vs. equity and need) on willingness to pay could be explained by perceived distributive justice.

In a second hierarchical regression analysis the dependent variable contrasted subjects' willingness to pay when the need principle rather than the equity principle applied. When income and personal need of child care and their interaction were entered in the first step, R^2_{adj} was .223, $F_{(3, 44)} = 5.50$, $p<.01$. The constant effect was significant, $t = -2.66$, $p<.05$, indicating that subjects overall showed more willingness to pay when the need principle compared to the equity principle applied. Both income (beta = .34, $t_{44} = 2.65$, $p<.05$) and personal need (beta = .38, $t_{44} = 2.99$, $p<.01$) were also significant. These effects indicated that the differences in willingness to pay between the need and the equity principles were larger for subjects who did not need child care and/or

had low income compared to for subjects who needed child care and/or had high income. In the next step subjects' ratings of perceived fairness of equity compared to need were entered. R^2_{adj} then increased to .431, $F_{(1, 43)} = 17.09$, $p<.001$, corresponding to the increase. Perceived fairness of distribution (beta = .46, $t_{43} = 4.13$, $p<.001$) was significant and eliminated the constant effect. Thus, the effect of distributive principle (equity vs. need) on willingness to pay could partly be explained by perceived distributive justice. However, income (beta = .32, $t_{43} = 2.88$, $p<.01$) and personal need of child care (beta = .30, $t_{43} = 2.66$, $p<.05$) were still significant.

In conclusion, in addition to perceived fairness, income, as well as personal need and municipality size to some extent accounted for willingness to pay. Thus, the results in Biel et al. (in press) and Experiment 1 regarding the positive effects of perceived fairness and income on willingness to pay for child care were replicated. The effect of perceived fairness was stronger than in Experiment 1, explaining about 7% and 20% of subjects' willingness to pay in the two regression analyses, respectively. It is possible that this enhanced role of perceived fairness is due to the different measure of willingness to pay in the present experiment. Furthermore, the results from the survey study concerning the positive relationship between degree of utilization of child care (personal need) and willingness to pay were replicated. In research on social dilemmas showing that those with larger interest in the resource are more likely to cooperate than those with less interest, interest has often been defined as profit or utilization (e.g., Marwell & Ames, 1979; Wit et al., 1992). Thus, in the present experiment with a more valid and successful manipulation of degree of utilization than in Experiment 1, the effect of utilization on willingness to pay found in the survey study was replicated.

Experiment 3

In line with Experiment 1, Experiment 2 showed that perceived fairness had an effect on willingness to pay. The effect of perceived fairness was stronger than in the survey study (Biel et al., in press) and in Experiment 1. The aim of Experiment 3 was partly to try to further enhance the importance of perceived fairness of distribution and partly to study the effects of provision threshold on willingness to pay. The task in Experiment 2 was formulated as a step-level public-goods dilemma where a number of households had to pay a fee to avoid reductions in the quality of the child care. By varying this number as a within-subject factor from 25% through 50% to 75%, subjects may attend even more to the threshold and adapt their contributions accordingly. Furthermore, when the required number decreases, it is possible that perceived fairness increases in importance. Thus, an unfair distribution may decrease willingness to pay more when the provision threshold is low (25%) compared to when the provision threshold is high (75%). On the other hand, when the provision threshold is high, one may believe that the collective goal will not be fulfilled and therefore, in line with the GEF hypothesis stating that the desire to maintain the efficiency of the resource enhances cooperation, be more willing to cooperate, despite the fact that the distribution is perceived as unfair. However, if one believes that the collective goal will not be fulfilled because the provision threshold is high, it is also possible that one will defect in order not to lose one's own contribution. Thus, it is of interest to study the effects of provision threshold on willingness to pay.

In both Experiments 1 and 2, as well as in the survey study (Biel et al., in press), subjects were first requested to rate perceived fairness and then to rate willingness to pay. It is possible that performing these ratings made fairness salient. Experiment 3 therefore used a design which permitted the assessment of the effect on willingness to pay of making the perceived fairness ratings. The experiment used two blocks where only one included ratings of perceived fairness. The order of presentation of the two blocks varied between groups. Performing the fairness ratings was not expected to have any effects on willingness to pay, nor was the order of presentation of the two blocks.

Since the effect of income on willingness to pay has been clear and univocal throughout the earlier studies, income was not manipulated. However, since subjects with high income in Experiment 2 were quite willing to cooperate even when they perceived the distribution as unfair, all subjects were asked to imagine that their income was low.

Furthermore, as predicted in Experiment 2, interest in the resource in terms of personal need (utilization) was shown to enhance willingness to pay. Subjects with personal need of child care were more willing to pay than subjects with no personal need. This could not be shown in Experiment 1, but was probably due to an invalid manipulation of personal utilization. Nevertheless, the effect needs to be replicated and personal need was therefore again manipulated in the same way as in Experiment 2.

Willingness to pay may also vary with subjects' expectations about how many others will contribute (Dawes, 1980). In line with the GEF hypothesis, this may be related to fairness considerations: If subjects think that others will not contribute, they may regard it as unfair that they should. It is also likely that subjects will regard it as unfair not to contribute when they believe that others will. Furthermore, if subjects

believe that others will not contribute as much as is required to maintain the quality of the service, they will probably avoid loosing their own contribution, and hence not contribute themselves. On the other hand, if subjects think that others will contribute enough to maintain the quality, greed may tempt them to free ride. However, in line with earlier research (Dawes, McTavish, & Shaklee, 1977; Messick, Wilke, Brewer, Kramer, Zemke, & Lui, 1983), we expected a positive correlation between own cooperation and assumptions about others' cooperation. Expectations about other's behavior was also expected to be affected by the provision threshold. Due to the motive to maintain the efficiency of the resource, it was hypothesized that more cooperation would be expected from others when the provision threshold was high compared to low. To investigate the effects of the assumptions about others' behavior, subjects were asked to rate their expectations about how many others they thought would contribute.

Method

Design

Two between-subjects and two within-subject factors were varied. The between-subjects factor were personal need of child care (personal need vs. no personal need) and the order between the two blocks where only one included ratings of perceived fairness (first vs. last). The two within-subject factors were ratings of perceived fairness (ratings vs. no ratings) and distributive principle (equality vs. equity vs. need). There were two

measured independent variables, perceived fairness and expectations about others' payment. The measured dependent variable was willingness to pay.

Material

In a booklet administered to subjects, nine hypothetical municipalities were described. They were presented twice, once asking subjects to rate how fair they considered the distribution of the quality of child care and once without asking them to do this. The ratings were performed on a graphical scale from 0 (Not fair at all) to 100 (Very fair). The quality of child care was said to be distributed according to equality, equity, and need, respectively. The definitions of the principles were the same as in the previous experiments.

All subjects were asked to imagine that they had an income below the average in the municipality. Furthermore, subjects were either asked to imagine that they had a child and therefore personal need of child care, or no child and consequently no personal need of child care.

For all municipalities, subjects were also asked to indicate on a graphical scale how likely they were to voluntarily pay a monthly fee of SEK 200 (approximately $26) so that the child care would maintain its quality which was threatened due to the bad financial situation. This scale varied from 0 (Not likely at all) to 100 (Very likely). The task was formulated as a step-level public-goods dilemma. If in different conditions either 25%, 50%, or 75% or more of the households in the municipalities paid this fee, the bad financial situation would not affect the quality of the child care. However, if less than 25%, 50%, or 75% of

the households paid, considerable reductions of the quality of child care would be unavoidable.

For each municipality, subjects were also asked to indicate on a graphical scale how many of the other households they thought would pay this fee (from 0% to 100%).

Procedure

The procedure in the present experiment was the same as the procedure in Experiment 2.

Subjects

Thirty two undergraduate students of psychology served as subjects, 20 women with a mean age of 30.9 years, and 12 men with a mean age of 30.2 years. Subjects were randomly assigned to one of four groups with 5 females and 3 males in each.

Results and Discussion

Perceived Fairness of Distribution

A 2 (personal need vs. no personal need) by 3 (25% vs. 50% vs. 75% provision threshold) by 3 (equality vs. equity vs. need distributive

principle) ANOVA with repeated measures on the last two factors was performed on the data from the nine municipalities where subjects rated perceived fairness of distribution. The analysis revealed a significant main effect of distributive principle, $F_{(2, 60)} = 55.01$, $p<.001$, indicating that the distributive principles affected subjects' ratings of perceived fairness. In line with the earlier studies, the equality principle was perceived as the fairest principle ($M = 77.4$), followed by the need principle ($M = 68.6$) and the equity principle ($M = 23.7$). Furthermore, there was a significant main effect of personal need, $F_{(1, 30)} = 5.90$, $p<.05$. For subjects with personal need of child care, a distribution according to the equality principle was perceived as the fairest distribution ($M = 87.8$), followed by a distribution according to the need principle ($M = 68.4$). However, for subjects with no personal need of child care there was hardly any difference in perceived fairness between a distribution according to the equality principle ($M = 66.9$) and the need principle ($M = 68.9$). Both groups considered the equity principle as an unfair distributive principle ($M = 26.2$ for subjects with personal need of child care and $M = 21.2$ for subjects with no personal need of child care). Although this effect was unexpected, it replicates the results in Biel et al. (in press) where it was found that citizens' degree of utilization of child care increased perceived fairness of the equality principle. Provision threshold had no effect on perceived fairness of distribution ($F<1$).

Willingness to Pay

Means for willingness to pay are presented in Table 4. To investigate the possible effects of performing the fairness ratings on willingness to pay, a 2 (ratings vs. no ratings of perceived fairness) by 2 (order between the

two blocks where only one included ratings of perceived fairness: first vs. last) ANOVA was performed with willingness to pay as dependent variable. The analysis revealed no significant effects (p>.15). Thus, performing the fairness ratings did not affect willingness to pay. Therefore, the following analyses will only include data from the nine municipalities where subjects rated perceived fairness of distribution.

Table 4. Mean Ratings of Willingness to Pay Related to Distributive Principle, Personal Need, Provision Threshold (%), and Whether or not Perceived Fairness was Rated.

	Distributive principle					
	Equality		Equity		Need	
Provision threshold	No personal need	Personal need	No personal need	Personal need	No personal need	Personal need
	No ratings of perceived fairness					
25%	34.4	68.9	18.8	55.6	28.2	64.8
50%	36.7	71.6	22.4	56.2	36.1	66.7
75%	39.5	75.1	19.7	61.8	38.8	67.7
	Ratings of perceived fairness					
25%	36.9	66.2	15.8	52.3	33.2	64.0
50%	41.4	76.3	26.2	59.9	43.9	69.3
75%	46.1	76.5	31.0	59.1	46.1	67.9

In a 2 (personal need vs. no personal need) by 3 (provision threshold: 25% vs. 50% vs. 75%) by 3 (equality vs. equity vs. need distributive

principle) ANOVA with repeated measures on the last two factors, three main effects reached significance. First, an effect of personal need, $F_{(1, 30)} = 18.77$, $p<.001$, replicated the results in the survey study (Biel et al., in press) and Experiment 2 and indicated more willingness to pay by those who were in personal need of child care ($M = 65.7$) compared to those who were not ($M = 35.6$). Second, distributive principle also had a significant effect on willingness to pay, $F_{(2, 60)} = 17.22$, $p<.001$. Again, the results of Experiment 2 were replicated in that subjects were more willing to pay when the quality of child care was distributed according to the equality principle ($M = 57.2$), somewhat less when distributed according to the need principle ($M = 54.1$), and much less when distributed according to the equity principle ($M = 40.7$). Third, the effect of provision threshold was also significant, $F_{(2, 60)} = 13.83$, $p<.001$. This effect suggested that willingness to pay increased with the number of required payers ($M = 44.7$ for 25%; $M = 52.8$ for 50%; and $M = 54.4$ for 75%) and can probably be explained by the motive to maintain the efficiency of the resource.

To test the hypotheses that the effect of distributive principle on willingness to pay is explained by perceived fairness and that subjects' willingness to pay is affected by how many others they think will pay the fee, willingness to pay for each distributive principle were contrasted and used as dependent variables in two separate hierarchical regression analyses with personal need, subjects' ratings of perceived fairness, and subjects' expectations about others' behavior as independent variables. These analyses were conducted in the same way as in Experiment 2. Thus, in the first regression analysis the dependent variable contrasted subjects' willingness to pay when the equality principle applied with the means of subjects' willingness to pay when the equity and the need principles applied. When the dummy coded variable personal need was

entered in the first step, an R^2_{adj} of -.028, $F<1$, was obtained. The constant effect was significant, $t = 3.50$, $p<.001$, indicating that subjects were overall more willing to pay when the equality principle applied compared to when the equity and the need principles applied. In the next step subjects' ratings of perceived fairness of the equality principle compared to the equity and the need principles were entered. R^2_{adj} then increased to .105, $F_{(1, 29)} = 5.47$, $p<.05$, corresponding to the increase. Perceived fairness of distribution (beta = .43, $t_{29} = 2.34$, $p<.05$) was the only effect that reached significance and thus eliminated the constant effect. Hence, the hypothesis was again supported in that the effect of distributive principle (equality vs. equity and need) on willingness to pay could be explained by perceived distributive justice.

When subjects' expectations about others' contribution were entered in the third step for the contrast of a distribution according to the equality principle compared to the equity and the need principles, R^2_{adj} increased reliably to .569, $F_{(1, 28)} = 32.21$, $p<.001$, corresponding to the increase. In accordance with earlier research (Dawes et al., 1977; Messick et al., 1983), subjects were affected by their assumptions about others' behavior when they decided whether to contribute (beta = .68, $t_{28} = 5.68$, $p<.001$) and acted in line with how they expected others to behave. Means for expectations about others' payment are presented in Table 5. As may be seen, subjects thought that more others would pay when equality was the distributive principle ($M = 44.8$), followed by the need principle ($M = 41.3$). Least payment from others was expected when the quality of child care was distributed according to the equity principle ($M = 35.5$). However, perceived fairness was still significant (beta = .36, $t_{29} = 2.83$, $p<.01$), indicating an effect of this factor over and above expectations about others' behavior.

Provision threshold also affected subjects' expectations about others' behavior. In line with what was expected, more others were expected to cooperate the higher the provision threshold (M = 32.9 for 25%, M = 41.7 for 50%, and M = 47.0 for 75%). Thus, both the distributive principles and provision threshold had the same effects on subjects' willingness to pay as on their expectations about others' behavior.

Table 5. Mean Ratings of Expectations About Others' Payment Related to Distributive Principle, Personal Need, and Provision Threshold (%).

	Distributive principle					
	Equality		Equity		Need	
Provision threshold	No personal need	Personal need	No personal need	Personal need	No personal need	Personal need
25%	30.4	44.2	20.6	36.6	28.1	37.7
50%	36.8	52.8	31.9	41.4	37.2	50.1
75%	44.6	60.0	32.8	49.8	40.2	54.7

In a second hierarchical regression analysis the dependent variable contrasted subjects' willingness to pay when the equity principle applied with subjects' willingness to pay when the need principle applied. When personal need was entered in the first step, an R^2_{adj} of .018, $F_{(1, 30)} = 1.57$, $p>.15$, was obtained. However, the constant effect was significant, t = -4.93, $p<.001$, indicating that subjects overall showed more willingness to pay when the distribution was according to the need

rather than the equity principle. In the second step, subjects' ratings of perceived fairness of equity compared to need was entered. R^2_{adj} then increased to .121, $F_{(1, 29)} = 4.50$, $p<.05$, corresponding to the increase. The constant effect was again eliminated by the significant effect of perceived fairness of distribution (beta = .36, $t_{29} = 2.12$, $p<.05$). Thus, the effect of distributive principle (equity vs. need) on willingness to pay could be explained by perceived fairness. In the third and final step of the analysis, entering subjects' expectations about others' payment, R^2_{adj} raised to .426, $F_{(1, 28)} = 16.43$, $p<.001$, corresponding to the increase. Subjects' willingness to pay when the equity principle compared to the need principle applied was positively related to their expectations about how many others would contribute when these principles applied (beta = .56, $t_{28} = 4.05$, $p<.001$). Furthermore, perceived fairness of the equity compared to the need principle still had a significant effect on willingness to pay (beta = .28, $t_{28} = 2.05$, $p<.05$).

General Discussion

It was shown in this study that the results from the survey conducted by Biel et al. (in press) were successfully replicated in experimental settings. A stable finding was that the choice of principle for distributing the quality of a social service has an effect on perceived fairness. In the case of child care, people generally prefer that the quality is equally distributed or according to need rather than equity. The agreement about

equality as the fairest distributive principle is rather striking. Why is it not perceived as fair that those who pay more receive better quality? It might be the case that equity was perceived as unfair because the resource that was distributed was provided by the municipality. Perhaps the consensus about equality is challenged if privately provided resources are to be distributed.

The preferences for the distributive principles also extend to willingness to pay for the service. Thus, people are more willing to pay to maintain the quality of the child care when it is distributed according to the equality or the need principles rather than the equity principle. The results clearly showed that the effects of distributive principles on willingness to pay can be explained by perceived fairness of distribution. Thus, perceived fairness eliminated the effects of distributive principles. This supports one of the central ideas in the GEF hypothesis, that fairness is a key factor when a person has to make a decision in conflict between the self interest and the collective interest. Furthermore, in Experiment 3 it was shown that the effects of perceived fairness on willingness to pay were not due to fairness being salient in the fairness ratings. Hence, subjects' willingness to pay did not differ when they rated how fair they perceived the distributive principles compared to when they did not. Nevertheless, in Experiment 1, substantially more of the within-subject compared to the between-subjects variance in willingness to pay was accounted for by perceived fairness. One reason may be the small variation in perceived fairness between individuals.

However, other factors than perceived distributive fairness also had effects on willingness to pay. That some are willing to pay more for a particular service than others can therefore not only be attributed to differences between individuals in conceptions about fairness. In addition, factors such as income and personal need (utilization) of the

service affect willingness to pay. Higher ability to cooperate (income) and larger interest in the resource (personal need and utilization) increased willingness to pay.

Municipality size also had an effect on willingness to pay. Compared to larger municipalities, more willingness to pay was manifested in smaller municipalities. This finding contradicts the finding in Biel et al. (in press) but supports the result found in earlier research on social dilemmas that group size affects degree of cooperation negatively (e.g., Hamburger et al., 1975; Komorita & Lapworth, 1982; Olson, 1965). The explanation given to the result in Biel et al. (in press), suggesting a confounding effect with degree of utilization, may resolve this contradiction. Thus, the fact that citizens in larger municipalities utilized the service more than citizens in smaller municipalities was suggested to explain the positive relationship between cooperation and municipality size. It may also be the case that a social identity in connection with child care is established in smaller units than a municipality, such as the day care center one utilizes.

There are still other factors influencing willingness to pay. When the provision threshold varied in Experiment 3, subjects adapted their willingness to pay accordingly. Thus, more willingness to pay was manifested when the number of required payers increased. This is probably due to the motive to maintain the efficiency of the public good. In accordance with the GEF hypothesis (Wilke, 1991), greed is constrained by the motive to preserve the resource. Thus, together with fairness, greed and efficiency are factors of importance when individuals are asked to contribute in public-goods dilemmas. In the same way as the GEF hypothesis accounts for cooperation in resource dilemmas, its predictions have, at least in part, thus been extended to public-goods dilemmas.

A further factor of interest in Experiment 3 was expectations about others' cooperation. Since in line with earlier research on social dilemmas (Dawes et al., 1977; Messick et al., 1983), there was a positive correlation between own propensity to cooperate and beliefs that others also will cooperate, a desire to "free ride" reflecting greed does not seem to be a prominent motive. Support for the idea that people believe that others will cooperate if they themselves cooperate was obtained from subjects in personal need of child care. When this was the case, expectations about others' cooperation were much stronger than when personal interest in the public good was absent. It is possible that this reflects fairness considerations. People may think that other people also are concerned with being fair. Thus, if people cooperate, they do not consider it as fair that others will not. Since this expectation was stronger for those in personal need of child care, it may also express a hope that others will support the service.

Finally, it may again be noted that the main results in Biel et al. (in press) were successfully replicated in the present experiments employing the hypothetical-society paradigm. The advantage of having experimental control may thus be maintained while variations due to personal experiences are added. In future research these methods may serve complementary purposes.

References

Allison, S. T., McQueen, L. R., & Schaerfl, L. M. (1992). Social decision making processes and the equal partitionment of shared resources. *Journal of Experimental Social Psychology, 28,* 23-42.

Allison, S. T., & Messick, D. M. (1990). Social decision heuristics in the use of shared resources. *Journal of Behavioral Decision Making, 3,* 195-204.

Biel, A., Eek, D., & Gärling, T. (in press). Distributive justice and willingness to pay for municipality child care. *Social Justice Research.*

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31,* 169-193.

Dawes, R. M., McTavish, J., & Shaklee, H. (1977). Behavior, communication, and assumptions about other people's behavior in a commons dilemma situation. *Journal of Personality and Social Psychology, 35,* 1-11.

Deutsch, M. (1975). Equity, equality, and need: What determines which value will be used as the basis for distributive justice? *Journal of Social Issues, 31,* 137-149.

Hamburger, H., Guyer, M., & Fox, J. (1975). Group size and cooperation. *Journal of Conflict Resolution, 19,* 503-531.

Harris, R. J., & Joyce, M. A. (1980). What's fair? It depends on how you phrase the question. *Journal of Personality and Social Psychology, 38,* 165-179.

Komorita, S. S., & Lapworth, C. W. (1982). Cooperative choice among individuals versus groups in an *N*-person dilemma situation. *Journal of Personality and Social Psychology, 42,* 487-496.

Marwell, G., & Ames, R. E. (1979). Experiments on provision of public goods. I. Resources, interest, group size, and the free-rider problem. *American Journal of Sociology, 84,* 1335-1360.

Messick, D. M., & Schell, T. (1992). Evidence for an equality heuristic in social decision making. *Acta Psychologica, 80,* 311-323.

Messick, D. M., Wilke, H., Brewer, M. B., Kramer, R. M., Zemke, P. E., & Lui, L. (1983). Individual adaptations and structural change as solutions to social dilemmas. *Journal of Personality and Social Psychology, 44,* 194-309.

Mitchell, G., Tetlock, P. E., Mellers, B. A., & Ordóñez, L. D. (1993). Judgments of social justice: Compromises between equality and efficiency. *Journal of Personality and Social Psychology, 65*, 629-639.

Olson, M. (1965). *The logic of collective action.* Cambridge Mass., Harvard University Press.

Rapoport, A. (1988). Provision of step-level goods: Effects of inequality in resources. *Journal of Personality and Social Psychology, 54*, 432-440.

Rapoport, A., Budescu, D. V., Suleiman, R., & Weg, E. (1992). Social dilemmas with uniformly distributed resources. In W. B. G. Liebrand, D. M. Messick, and H. A. M. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings.* Oxford: Pergamon Press.

Rapoport, A., & Suleiman, R. (1993). Incremental contribution in step-level public goods games with asymmetric players. *Organizational Behavior and Human Decision Processes, 55*, 171-194.

Rutte, C. G., Wilke, H. A. M., & Messick, D. (1987). Scarcity or abundance caused by people or the environment as determinants of behavior in the resource dilemma. *Journal of Experimental Social Psychology, 23*, 208-216.

Tyler, T., & Dawes, R. M. (1993). Fairness in groups: Comparing the self-interest and social identity perspectives. In B. A. Mellers, & J. Baron (Eds.), *Psychological perspectives on justice: Theory and applications* (pp. 87-108). New York: Cambridge University Press.

Van Dijk, E., & Grodzka, M. (1992). The influence of endowments asymmetry and information level on the contribution to a public step good. *Journal of Economic Psychology, 13*, 329-342.

Van Dijk, E. (1993). *Coordination in asymmetric social dilemmas.* University of Leiden, doctoral dissertation.

Van Lange, P. A. M., Liebrand, W. B. G., & Messick, D. M., & Wilke, H. A. M. (1992). Introduction and literature review. In W. Liebrand, D. M. Messick & H. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings* (pp. 3-28). Oxford: Pergamon Press.

Wilke, H. A. M. (1991). Greed, efficiency and fairness in resource management situations. In W. Stroebe, & M. Hewstone (Eds.), *European review of social psychology* (Vol. 2, pp. 165-187). New York: Wiley & Sons.

Wilke, H. A. M., Liebrand, W. B. G., Lotgerink, B., & Buurma, B. (1986). Equity and individual preferences in a MDG. *European Journal of Social Psychology, 16*, 131-148.

Wit, A., Wilke, H. A. M., & Oppewal, H. (1992). Fairness in asymmetric social dilemmas. In W. B. G. Liebrand, D. M. Messick, and H. A. M. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings* (pp. 183-197). Oxford: Pergamon Press.

Prior reports published by CEFOS:

Behovsbudgetering. Nya budgetprinciper i kommuner. Cecilia Bokenstrand. 1/1993

Självständighet eller statsbundenhet. Den kommunideologiska idédebatten 1962-1974. Urban Strandberg. 2/1995

Finansieringsanalysens dimensioner. Teori och kostnader. Pär Falkman och Stefan Pauli. 3/1995

Utveckling och tillämpning av ekonomistyrning i en decentraliserad kommunal organisation. Problem och möjligheter vid förändringsarbete - en fallstudie om ekonomistyrning. Lennart Jansson. 4/1995

Risk Management and Health Care. Per-Hohan Horgby. 5/1995

Skolchefers arbete. Om chefskap och styrning inom skolsektorn. Anna Cregård. 6/1996