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Exploring Group Behavior in a Power-to-Take Video Experiment*

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Abstract

This paper experimentally explores group decision-making in a two-player power-to-take game. Discussions preceding group decisions are videotaped and analyzed. Each subject first earns an income in an individual effort task preceding the game. The game consists of two stages. First, one group can claim any part of the income of the other group (take rate). Then, the latter group can respond by destroying own income. The results show: (1) group behavior is in line with individual behavior, but depends crucially on the decision rules that subject use to arrive at their group decision; (2) groups ignore the decision rule of their 'opponents' and typically view other groups as if they were single agents; (3) perceptions of fairness are prone to the so-called self-serving bias; (4) expectations are often not consistent with actual outcomes.

Key words: groups, decision rule, fairness, experiment, video.

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1. Introduction

In many economic situations, decisions are not taken by individuals but by groups, like committees, management teams or families. In economic theory, however, groups are often modeled as a single agent. Economists assume that groups do not behave differently than individuals. The object of this paper is to explore group decision-making in a controlled laboratory experiment. In addition to comparing group and individual decisions, we particularly focus on the dynamics of the group decision-making process. An important and new feature of this experiment is that groups are being videotaped while making their group decision.[1] The videotapes are used to make transcripts of the group discussions.[2] With the help of these transcripts, it is possible to learn more about individual motivations, such as fairness norms or urges to reciprocate, and the way these (sometimes conflicting) motivations interact in a group. Since gathering data on group behavior is expensive in general and, in our case, time consuming the number of observations is relatively small.[3] Nevertheless, the data are a rich source of information from which some interesting regularities about group behavior can be inferred.

Our experiment involves a simple two-player power-to-take game. This game was used by Bosman & van Winden (2002) – referred to as BvW, below – to study the influence of emotions on economic decision-making. Before this game is played, each player first has to earn an endowment E_i by doing an individual effort task. In the game one player can be considered as the 'take authority' (with endowment E_{take}) who is paired to another player, the 'responder' (with endowment E_{resp}). There are two stages. In the first stage, the randomly chosen take authority decides on the so-called take rate $t \in [0,1]$, which is the part of the responder's endowment after the second stage that will be transferred to the take authority. In the second stage, the only action that the responder can take is to decide on $d \in [0,1]$, the part of E_{resp} that will be

[1] According to Loomes (1999), the use of audio or video records makes up one of the real challenges of experimental economics in the future. For a more elaborate discussion on this research method, see Hennig-Schmidt (1999). Other experimental studies where video records are used, include Jacobsen & Sadrieh (1996) and Sadrieh & Hennig-Schmidt (1999).

[2] The reason why we videotaped group discussions, instead of audio tape, is that speakers can be identified more easily (Orbell et al., 1988). Moreover, non-verbal expressions, such as gestures and facial expressions, are also recorded and may facilitate identifying speakers and understanding their speech.

[3] We have 12 observations, which we believe is in line with many other studies on group-decision making. For example, in Bornstein & Yaniv (1998), who study ultimatum games, there are 12 independent observations and in Goren & Bornstein (2000), focusing on prisoners' dilemma games, there are 10 independent observations.

destroyed. For the take authority the payoff of the game is thus equal to the transfer $t(1-d)E_{resp}$, generating a total earnings out of the experiment equal to $E_{take} + t(1-d)E_{resp}$. For the responder, the payoff equals $(1-t)(1-d)E_{resp}$, which also determines her or his total earnings. Note that in this game the responder can only destroy his or her own prior-to-the-take endowment (E_{resp}) and not that of the take authority (E_{take}). Furthermore, it follows that only if t=d=0 experimental earnings for both players will be equal to the endowment; otherwise, the responder will always get less than E_{resp}, whereas the take authority gets at least E_{take}.

The power-to-take game is interesting from an economic point of view because it captures important aspects of taxation, principal-agent relationships, and monopoly pricing. In the area of taxation, for example, an owner of a production factor could diminish the supply of this factor if he or she feels that the tax on the returns to this factor is outrageous. BvW found that take authorities choose considerable take rates (the mean rate is almost 60%) and that responders typically destroy nothing or everything. In addition, expectations of the claim to be made by the take authority turn out to be important for the probability of destruction (responders who are optimistic, with hindsight, typically destroy).

Although social psychologists have studied group dynamics quite extensively, there has not been much experimental work on group decision-making in economic settings.[4] Moreover, the evidence gathered by economists is inconclusive. For example, Bornstein & Yaniv (1998) find that groups who play an ultimatum game behave more in accordance with standard economic theory than individuals. Groups who are in the role of proposer demand more than individuals, while groups who are in the role of responder accept less than individuals. In the power-to-take game, which bears similarity to the ultimatum game, this should then show up in higher takes rates and lower destruction rates for groups. In an experimental study of the investment game (Berg et al., 1995), where a sender can send some amount x of his or her endowment to a receiver (which will then be tripled by the experimenter) and where the receiver can reciprocate by sending money back, Cox (2001) finds that only groups in the role of receiver behave more rationally than individuals (i.e. they send less money back than individuals do). However, other studies show that groups behave in a more other-regarding way (Cason & Mui, 1997, investigating the dictator

game), that they behave in the same way as individuals (Bone et al., 1999, focusing on lottery choice; see also Rockenbach et al., 2001; Prather & Middleton, 2002, examining the performance of mutual funds), or that they behave somewhat less rational than individuals (Cox & Hayne, 1998, studying common value auctions). There is also evidence that groups do not behave differently per se but learn faster and reason with more depth compared to individuals (Kocher & Sutter, 2000, studying beauty contests).

Note that the above-mentioned studies compare decisions made by groups with decisions made by individuals. Our approach is new in the sense that we investigate the decision-making process as well, thereby focusing on how individual motivations interact in a group. To that purpose, discussions preceding decisions are videotaped and analyzed. With the help of this new method, we are able to explore interesting features of group decision-making that could not have been studied otherwise. The rest of this paper is organized as follows. In the next section, we discuss our research questions in more detail and present the experimental design. In section 3 the results are given. Section 4 follows with a summary and discussion.

2. Research questions and experimental design

2.1 Research questions

Our first question is whether the decisions made by groups in the power-to-take game are different than those made by individuals. To that purpose, we compare our data on group behavior with the data on individual behavior of BvW. An import finding by social psychologists in this respect is the so-called 'discontinuity effect', which reflects the idea of group relations to be more competitive or less cooperative than those between individuals (Insko et al., 1988; Schopler et al., 1993). This hypothesis has originated from the research of Insko and Schopler et al. on 2-person prisoner's dilemma games, but support has been found for it in other games as well, such as ultimatum games (Bornstein and Yaniv, 1998; Robert and Carnevale, 1997) and in negotiations (Polzer 1996). Applied to the power-to-take game, these findings suggest that take authority groups take more than individuals do, while responder groups destroy more easily than individuals.

[4] We will discuss some major findings by social psychologists in the next section when we present our research questions in more detail.

It is also possible that groups reason deeper and more carefully, and are therefore able to understand the strategic nature of the game more easily (Kerr et al, 1996; Sutter & Kocher, 2000). This would imply that group behavior is more in line with the standard economic model, that is, take authority groups take more than individuals would do and responder groups destroy less than individuals.

Our second research question concerns the group decision-making process. In particular, we want to explore what kind of motivations are important in the power-to-take game and how individuals, given their motivations, reach a group decision. In the experiment we did not impose any decision rule on subjects. They had 10 minutes for discussion and were asked to reach a decision in that period. An interesting question is what type of decision rule subjects employ. And, whether groups take the decision rule of their 'opponent' into account when making their group decision. For example, if take authority groups believe that responders will use the majority rule and that most of them do not want to destroy, then they would probably take more from a group than from an individual responder.

There is evidence that people typically ignore the way in which groups reach their decision. For example, Messick et al. (1997) let individual proposers play an ultimatum game against responder groups, while manipulating the decision rule (which is known to the proposers) imposed on the responder group. They found that proposers ignore or overlook the importance of the group's decision rule and therefore do not maximize their payoffs. The authors attribute this finding to subjects' insensitivity to implications of the different decision rules and the difficulty they have with thinking accurately about the cognition of others. In light of this study, we would expect that subjects in our experiment do not take into account the way in which groups arrive at their group decision.

The last research question deals with the role of expectations. As we pointed out in the introduction, BvW found that responders' expectations play an important role in the decision to destroy their earned resources. Yet expectations should not play a role according to standard economic theory. Given the potential relevance of expectations, as suggested by the experimental findings, we will explore their role in the decision-making process of both responder and take authority groups.

2.2 Experimental design

The group experiment was run in the Laboratory of Experimental Economics at the University of Bonn. In total, 70 subjects, almost all undergraduate students from the University of Bonn, participated in the experiment. The show-up fee was 20 German marks (approximately 10 U.S. dollars), independent of subjects' earnings in the experiment. In addition, subjects earned approximately 38 marks on average. The whole experiment took about 2 hours. We framed the take game as neutral as possible, avoiding any suggestive terms like take authority or responder (a translation of the instructions is provided in the Appendix).

Before subjects played the power-to-take game, each subject first had to earn her or his endowment by doing the same individual effort task as in the experiment of BvW. This task is a computerized two-variable optimization problem that lasts for 30 minutes.[5] It consists of 10 periods, where in each period subjects have to search for a maximum value. This maximum, which varies over the periods, can be imagined as the top of a mountain. The payoff for a period is related to the position on the mountain at the end of the period, with a maximum of 2 German marks. The task was set up such that most subjects were able to find the maximum value within the time limit of three minutes. Almost all subjects earned the maximum amount of 20 German marks.

After subjects had completed the computer task, they were randomly divided into two groups. One group was referred to as participants A (the take authorities) and the other as participants B (the responders). Then the instructions for the take game were read, followed by two individual exercises to check subjects' understanding of the procedures. After these exercises, random responder and take authority groups were formed by letting take authorities draw a coded envelope from a box. Each group consisted of three members.[6] The envelope contained a form on which the income of a responder group from the real effort task were stated (see Appendix). The income of the group equaled the aggregate income of its members. The take authorities then had to leave the room and each group was brought to a separate room.

The responders were now asked to fill out a short questionnaire with questions concerning expectations and social back ground. Thereafter, each responder learned

[5] For more details on this computer task, see van Dijk et al. (2001).

[6] There were 12 take authority and 12 responder groups. In one case, both the take authority and responder group consisted of two members.

about the take rate chosen by the take authority group they were matched to. After having filled out a second short questionnaire[7], responders were put in their group and each group was brought to a separate room.

Each take authority group had 10 minutes to make a decision on the take rate, which was videotaped. After these 10 minutes, they had to fill in their own earnings as well as the take rate, and put the form back in the envelope again. Subsequently, the envelopes were brought to the matched responder groups who had 10 minutes time to decide on the part of their earnings to be destroyed, which was videotaped as well. The envelopes containing the forms were then returned to the take authority groups for their information. Before the take authority group received this envelope they had to fill out a short debriefing questionnaire, including a questionnaire about expectations. The responders were also asked to fill out a short debriefing questionnaire. After having completed these questionnaires, subjects were paid out.

3. Results

Group behavior

A summary of group behavior is given in table 1. It appears that groups behave in much the same way as individuals. The take rates in the group experiment are similar to the take rates in the experiment of BvW (see the Appendix for a summary of their data). Two out of twelve groups destroyed their whole group income, while one destroyed 50%. These numbers are in line with individual responder behavior in the experiment of BvW.

RESULT 1: *Group behavior is in line with individual behavior.*

Support. Using a Mann-Whitney test, the hypothesis that the take rates in our experiment and the take rates from BvW are drawn from the same distribution cannot be rejected (p=0.77). Using a fisher exact test, the hypothesis that the proportions of responders who destroyed are the same in our experiment and the experiment of BvW cannot be rejected (p=0.71).

[7] This questionnaire contained some questions about experienced emotions, as focused on in Bosman & Van Winden (2002).

Result 1 suggests that behavior in the power-to-take game is similar for groups and individuals. However, this result is not in line with the so-called discontinuity effect, discussed in the previous section. Groups do not appear to be more competitive than individuals. Furthermore, it is not in line with the idea that groups reason deeper and therefore behave more in accordance with the standard model than individuals. We now turn to the group decision-making process of the responders.

Table 1. Summary of group behavior

Case (#)	Take rate (%)	Destruction rate (%)
1	40	0
2	45	0
3	50	0
4	50	0
5	50	0
6	60	100
7	60	0
8	60	0
9	72	0
10	73	0
11	75	50
12	85	100

Note: Cases are ordered by the take rate.

3.1 Group decision-making process of responders

To investigate the relation between individual motivations and group behavior, we need a measure of an individual responder's willingness to destroy based on the transcripts. To that purpose we define a new variable called the 'individual destruction input', which is either (1) the first destruction rate that is mentioned and can be identified as an intention or proposal, or (2) the first approval or confirmation of some destruction rate mentioned by another individual. It turns out that for one subject only it was not possible to determine her or his individual destruction input.[8] The individual inputs are depicted in the last three columns of table 2. The other columns reproduce the data of table 1, for convenience.

[8] To score the individual destruction inputs two raters went through the transcripts independently. In 4 out of 35 cases, there was a discrepancy in scores. Subsequently, these four cases were again

Table 2. Individual destruction inputs

Case (#)	t (%)	D (%)	Individual destruction input (%)		
			responder 1	responder 2	responder 3
1	40	0	0	0	0
2	45	0	0	0	/
3	50	0	0	0	100
4	50	0	0	0	100
5	50	0	0	0	>0
6	60	100	100	100	100
7	60	0	0	0	0
8	60	0	0	0	0
9	72	0	40	0	?
10	73	0	0	0	0
11	75	50	0	100	0
12	85	100	100	100	100

Note: t denotes the take rate and d the part of the group income that is destroyed. The last three columns give the individual destruction input of each individual responder i=1, 2, 3.; case 2 consists of two individual responders; case 9 has one missing observation. Cases are ordered by the take rate.

The next result deals with the individual input of responders.

RESULT 2: *Individual responders typically want to destroy either 0 or 100% of the earned group income. Furthermore, the individual inputs are in line with individual behavior in the experiment of BvW.*

Support. In total, 32 out of the 35 subjects showed a preference for a destruction rate of either 0 or 100%, while 2 wanted to destroy an intermediate amount, and one member did not reveal a preference. We cannot reject the hypothesis that the individual inputs are drawn from the same distribution as the individual destruction rates in the experiment of BvW (Mann-Whitney test, two-sided, p=0.30).

Note that result 2 is in line with the BvW experiment where individuals either destroy everything or nothing. For example, the transcripts show that in one group an individual said: “OK, I believe there are only two extremes since the rest is foolish”, while in another group a member said: “So, in my view the question can only be, do

considered by two other raters, followed by a final discussion with all raters. Ultimately, the discrepancies were solved and supported by all raters.

we destroy everything or do we destroy nothing (...) in between is playing". In the responder group where 50% of the group income was destroyed, the group outcome was clearly a compromise, since individual members indicated to prefer a destruction rate of either 0 % or 100%.

Responders' individual expectations of the take rate appear to play a qualitatively similar role in our experiment as in the experiment of BvW. Recall that the individual responder's expectation of the take rate was assessed before group members came together to decide on destruction and before they learned about the take rate. It turns out that responders who are too optimistic typically provide an input for destruction in the group discussion.

RESULT 3: *Responders who were optimistic typically provide an input for destruction in the group discussion.*

Support. It turns out that 15 out of 29 responders who reported an expectation and revealed their input were optimistic (that is, for them the actual take rate was higher than expected) and 8 out of these 15 optimists provided an input for destruction, while of the 14 pessimists/realists only 3 provided an input for destruction. Using a Fisher exact test, the hypothesis that the proportion of optimistic responders who provided an input for destruction is the same as the proportion of pessimistic/realistic responders who provided an input for destruction is rejected at the 10% level (p=0.082, one-sided). A binary logit model, with the individual input as dependent variable (equal to 1 if the individual input is greater than zero; 0 otherwise) and as explanatory variable the expected take rate, gives further support that expectations are important for the individual destruction input (the estimated model, with a coefficient of –0.037, is significant at the 5% level, n=29). The logit model that also includes the take rate is marginally significantly better (likelihood ratio test, p=0.07; coefficient for the take rate is 0.07 and for the expected take rate -0.04).

RESULT 4: *The individual responder's expectation of the take rate is on average consistent with the actual take rate chosen by the take authority group. However, there is a lot of variation around the mean. Furthermore, it seems that individual responders in the group experiment expect lower take rates than responders in the individual experiment of BvW.*

Support. The average expected take rate is 51.3% (st. dev.=28.7). There is no correlation between the expected take rate and the actual take rate (Spearman correlation coefficient=-0.16, p=0.39). Using a Mann-Whitney test, the hypothesis that the expected take rates and actual take rates are drawn from the same distribution is not rejected (p=0.44, two sided). Out of 30 responders who reported an expectation, 3 had beliefs confirmed, 11 were too pessimistic, and 16 were too optimistic. Finally, the hypothesis that the expected take rates in the group experiment and the expected take rates in experiment of BvW are drawn from the same distribution is rejected at the 10% level (p=0.0564, two-tailed).

Although responders on average had beliefs consistent with actual behavior, the majority of responders did not predict the take rate very well, as there is a lot of variation around the mean. The average expected take rate in the group experiment is 51% and in the individual experiment 66%. Since the actual mean take rate in our experiment and the experiment of BvW is 60%, responders in our experiment are (on average) too optimistic. In the discussion of section 4 we will come back to this result.

Another interesting observation is that responders typically stuck to their intended decisions in the group discussion, even in case of conflicting preferences. Those who wanted to destroy neither seemed to cool off nor got persuaded by more 'rational', i.e. self-interested, members during the 10 minutes discussion. In most cases where there was no agreement, the group decision is consistent with a simple majority decision rule (note that no formal decision rule was imposed).

OBSERVATION 1: *If there is a conflict in terms of destruction inputs, then most group decisions are consistent with a simple majority decision rule.*

Support. In seven groups all individual responders had the same destruction input, which also turned out to be the group destruction rate. In four groups there was a conflict in terms of destruction inputs: two out of three responders in each group showed a preference for no destruction, while the others preferred to destroy either something or everything. In three out of those four groups, the destruction rate was equal to the destruction rate preferred by the majority, while in one group a compromise was made at 50%. Note that in all these four groups responders explicitly

discussed the group decision rule. In those three groups where the group decision is consistent with majority rule, there was also an explicit reference to majority rule in the group discussion. Finally, note that in one group we cannot conclude whether the group decision is consistent with majority rule because the individual destruction input of one responder could not be determined.

Interestingly, observation 1 suggests that the composition of the group, in terms of individuals' inputs, determines whether group behavior is more or less 'rational' than that of its members. In the next section we will come back to this issue.

Next we investigate whether responders are concerned with fairness, in particular with respect to the take rate. To that purpose we need some measure of a responder's notion of fairness based on the group discussion. We define a fair take rate in a similar way as was done for the individual destruction input, namely (1) the first take rate that is explicitly referred to as being fair or (2) the first approval or confirmation of the perception of fairness revealed by another responder.[9] Although it turns out that only a small subset of the responders explicitly refers to fairness, all of them perceive a take rate of 0% as being fair.

RESULT 5: *The majority of responders do not discuss fairness when making the group decision. When fairness is discussed, they all perceive a take rate of 0% as fair.*

Support. 5 out of 35 responders referred to fairness during the group discussion. All of them share the opinion that a take rate of 0% is fair.[10]

For example, in one responder group it is discussed that " Group A gets 40 marks for sure (…) so it would have been fair, when they had taken 0%".

[9] With regard to scoring fairness, in 2 out 35 cases there was discrepancy among the raters. After a short discussion, all discrepancies could be solved.

[10] In addition to the word 'fair', some responders used expressions that could be related to fairness. For example, one responder refers to destruction as 'a moral case' because the take authorities have taken something that the responders have earned themselves. Furthermore, this responder points out that the take authorities and the responders have done the same amount of effort to obtain their endowment. Because raters did not always agree whether expressions such as these refer to fairness, we have reported results for the explicit use of the word 'fair' only.

The last result on responder behavior deals with the way in which the responders view the take authorities. More specifically, do responders in their decision take the group decision-making process of take authorities into account?

RESULT 6: *Responders perceive the take authority group as a single agent and typically ignore intra-group processes.*

Support. In the group discussion of responders there was never any reference to the group decision-making process of take authorities. When they refer to the take authority group, they refer to it as if it were a single agent.

Result 6 is in line with the aforementioned study of Messick et al. (1997), showing that individuals typically ignore the decision rule of an opponent group.

3.2. Group decision-making process of take authorities

In the analysis of take authorities, we again look at the relation between individual motivations and group behavior. To that end we define a new variable called the 'individual take input', which can be seen as a measure of an individual take authority's willingness to claim income of the responder group. It is defined as either (1) the first take rate that is mentioned and can be identified as an intention or proposal, or (2) approval or confirmation of some take rate mentioned by another individual. It turns out that for one subject only it was not possible to determine her or his individual take input.[11] The individual inputs are depicted in the last three columns of table 3, where the remaining columns are reproduced from table 1, for convenience.

First we investigate whether the individual take inputs differ from the take rates selected by individual players in the experiment of BvW. It turns out that this is not the case.

RESULT 7: *The individual take inputs are similar to the take rates selected by individual players in the experiment of BvW.*

Support. Using a Mann-Whitney test, the hypothesis that the individual take inputs are the same as the take rates selected by individual players in the BvW experiment cannot be rejected (p=0.66, two-tailed; a Kolmogorov-Smirnov test also shows no significance, p=0.53). The average take input is 62.4% (st. dev.=23.7) while in the BvW experiment it is 58.5% (st. dev.=24.3).

Table 3. Individual take inputs

Case (#)	t (%)	D (%)	Individual take input (%)		
			take authority 1	take authority 2	take authority 3
1	40	0	30	20	20
2	45	0	100	50	/
3	50	0	50	60	75
4	50	0	49	60	45
5	50	0	50	100	0
6	60	100	50	50	55
7	60	0	75	60	60
8	60	0	100	50	70
9	72	0	70	70	75
10	73	0	73	50	75
11	75	50	90	75	90
12	85	100	100	75	?

Note: t denotes the take rate and d the part of the group income that is destroyed. The last three columns give the individual take input of each individual take authority i=1, 2, 3.; case 2 consists of two individual take authorities; case 12 has one missing observation. Cases are ordered by the take rate.

We now turn to the expectations of individual take authorities with regard to destruction. First we assess whether the individual take authority's expectation of the destruction rate in the group experiment is in line with individual expectations in the BvW experiment. Although expectations in the group experiment were assessed somewhat differently than in the BvW experiment, the reported expected destruction rates appear to be similar.[12] Furthermore, as with the responders, it appears that the

[11] The individual take inputs were scored in the same way as was done for the individual destruction inputs of the responders (see 3.1).

[12] A direct comparison of the expectations of take authorities in the BvW and group experiment is somewhat complicated by the fact that in the first experiment subjects were asked to assign a probability to an interval of possible destruction rates (quartiles), whereas in the latter experiment they had to select a single rate. As it turned out, in the BvW experiment the mean probability of destruction reported by the take authorities was 67.5% for the interval [0%, 25%] (and 9%, 6%, and 10% for the next three intervals, respectively). In the group experiment the mean of the expected destruction rate

expectations of the take authorities in the group experiment are not consistent with reality, that is, they deviate from the destruction rates that were actually chosen by the responder groups.

RESULT 8: *Expectations of the take authorities regarding the behavior of the responder groups are not consistent with actual responder behavior.*

Support. The average expected rate of destruction is 9.7% (st. dev.=15.8), whereas responder groups destroyed on average 21% of their income. Note that 19 subjects expected a destruction rate of 0%, while 14 subjects expected a destruction rate between 5 and 70%. Furthermore, it turns out that there is no correlation between the expected destruction rate and the actual destruction rate (Spearman correlation coefficient=-0.09, p=0.63). This shows that take authorities did not have realistic expectations, that is, expectations that are consistent with actual responder behavior. Out of the 33 take authorities who reported an expectation, 14 had beliefs consistent with reality, 11 were too pessimistic, and 8 were too optimistic.

We now turn to the question of how take authorities arrive at their group decision. It appears that group behavior is consistent with two types of decision rules.

OBSERVATION 2: *The group decision of take authorities could be consistent with both majority rule (median voter behavior) and a group compromise (approximated by the average individual take input).*

Support. If we consider the groups with a median voter, assuming single-peaked preferences, it turns out that in 4 out of 10 cases the take input of the median voter lies closer to the group decision than the average take input. In 5 out of these 10 cases, the average take input lies closer to the group decision than the input of the median voter. In one case the group decision, take input of the median voter, and the average take input coincide. However, if we look at the correlation between, on the one hand, the group decision and, on the other hand, the take input of the median voter or the

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was 9.7%. If we distribute the expectations in the group experiment over the categories as used in the BvW experiment, the mean rate is 88% for the interval [0, 25] (and 9%, 3%, and 0% for the next three

average take input, in turns out that both correlations are significant (coefficient for correlation is 0.90 and 0.86, respectively; both $p<0.01$). This correlation suggests that either decision rule could generate the observed outcomes, and we cannot say for sure which one is predominant. Note that the average take input is 55.1% and the median input 59.2%, which explains why it may be hard to discriminate between these two decision rules.[13]

Next we investigate whether take authorities are concerned with fairness. We define a fair take rate in a similar way as was done for the responders, namely (1) the first take rate that is referred to as being fair or (2) the first approval or confirmation of the perception of fairness revealed by another take authority.[14] Although only a small subset of the take authorities explicitly refers to fairness, a majority of them perceive a take rate greater than 0% as being fair.

RESULT 9: *Most take authorities do not discuss fairness when making the group decision. When fairness is discussed, it is typically at a later stage of the group discussion. Almost all take authorities who discuss fairness perceive a take rate greater than 0% as fair.*

Support. Out of the 35 take authorities 9 referred to fairness during the group discussion, with 8 (1) of them believing that a take rate greater than (equal to) 0% is fair (7 believed that a rate of 50% is fair).[15] Furthermore, in only 1 out of 12 groups fairness was discussed in an early stage of the group discussion.

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intervals, respectively). We conclude that the reported information in both experiments appears to be similar.

[13] Interestingly, if we look at the correlation between the group decision and the lowest (or highest) take input of the group, it turns out that only the lowest take input is significant (coefficient=0.80, $p<0.01$; p-value of the high take input is 0.41; note that in 4 cases the median take input is equal to the lowest take input). In other words, greedy individual take authorities, who behave more in accordance with the standard model, are generally not able to dominate the group decision. This finding is in contrast with Robert & Carnevale (1997) who observed in the context of ultimatum bargaining that the preference of the most competitive group member predicts the group outcome best.

[14] With regard to scoring fairness, again in 2 out 35 cases there was a discrepancy among the raters. After a short discussion, these discrepancies could be solved.

[15] In addition to the word 'fair', other expressions were used that could be related to fairness. These expressions include: 'a take rate of 50% is honest', ' a take rate of 60% is also social', and 'taking everything is terribly mean'. As was the case for the responders, raters did not always agree whether expressions such as these refer to fairness. Therefore, we have reported results for the explicit use of the word 'fair' only.

Interestingly, there is a large discrepancy between what responders generally consider to be fair (a take rate of 0%) and what take authorities perceive to be fair. For example, one take authority points out that " we only play with regard to their earned money" and another take authority "50% after all is a fair deal". When it comes to fairness, it seems that individuals are prone to the so-called self-serving bias. We come back to this result in more detail in the next section. The last result deals with the way in which the take authorities view the responders. More specifically, do take authorities in their decision take the group decision-making process of responders into account?

RESULT 10: *The take authorities perceive the responder group as a single agent and typically ignore intra-group processes.*

Support. In the group discussion of take authorities there was never any reference to the group decision-making process of the responders. When they refer to the responder group, they refer to it as if it were a single agent.

Surprisingly, both the take authorities and responders ignore the group decision making process of their opponents. In the next section, we come back to this results and shall discuss the implications of this 'single agent perspective' in more detail.

4. Summary and discussion

The goal of this paper is to study group-decision making in a power-to-take experiment. A new feature of our study is that discussions preceding group decisions are videotaped and analyzed. We explore in which way individual motivations, such as norms of fairness and urges to retaliate, interact in a group. In addition, we investigate the role of expectations. Our results show that group behavior is in line with behavior observed in the individual power-to-take experiment. Take authority groups choose considerable take rates and responder groups destroy a substantial part of their earned income when the take rate is high. At the individual level, most responders want to destroy 0 or 100% of their group income. Furthermore, it appears that if there is a conflict in terms of input, responder groups typically use majority rule

to arrive at their group decision. The decision of take authority groups, on the other hand, is consistent with both majority rule and with a group compromise, approximated by the average individual input. Expectations of responders and take authorities concerning the behavior of their 'opponents' are usually not consistent with actual behavior. Although only a small fraction of the subjects discusses fairness explicitly, responders clearly have a different view than take authorities on what is fair in the power-to-take game. Finally, it appears that both the take authority and responder groups ignore the way in which their 'opponent' reaches a decision. Groups typically view other groups as if they were single agents.

In the now growing literature on group decision-making in economics, the key question is whether groups behave differently than individuals. To answer this question, virtually all studies compare group decisions with individual decisions. At first sight, our results support the view that group behavior is in line with individual behavior. However, our results also show that when groups are compared to individuals the decision rule and the composition of the group in terms of individual inputs play a crucial role. Recall that we did not impose any decision rule on groups to reach their decision. Yet all groups were able to arrive at a group decision by employing either a simple majority rule or by making a compromise in the direction of the average individual input. To illustrate the importance of the decision rule, table 4 shows some outcomes of different decision rules for responders, given the observed individual inputs. As can be seen from this table, the percentage of groups that destroy can range from 18%, in case of a simple majority rule, to 58%, which would result if a compromise is made. Furthermore, note that also the composition of the group, in terms of individual inputs, is important for the outcome. Our data (see table 2) shows that the inputs of responders were not distributed randomly over the groups since there were two groups where every responder provided a destruction input of 100%. Suppose the inputs were distributed more randomly, with for example only one responder providing an input for destruction in each group. In that case, the decision rule turns out to be even more important because the percentage of responder groups that destroy could range from 0% (majority rule) to 92% (compromise).[16]

[16] If the eleven responders who provided a positve input for destruction were allocated to different groups, then zero groups would destroy (part of) their income under a majority rule and eleven groups under a compromise rule (that is, 92% of the responder groups would destroy part of their group income).

Given the importance of a decision rule in group decision-making, as suggested above, it is surprising that groups do not discuss at all the way in which other groups reach a decision. Groups clearly have a tendency to perceive other groups as if they were single agents (see also Messick, et al., 1997). It would be interesting to establish whether this phenomenon also shows up in different environments (e.g. other experimental games), whether it occurs when subjects are given explicit information about the decision rule, and whether subjects can learn to take the decision rule of their 'opponents' into account (e.g. via repetition of the game).

Table 4. Group destruction under different decision rules for responders

Decision rule	*Percentage of groups that destroy*
Actual behavior	0.25
Majority rule	0.18
Minority rule	0.45
Compromise*	0.58

Note: * the average input of all responders equals the group decision.

We conjectured that fairness norms would play an important role in the group discussions. Although only a small fraction of the subjects discusses fairness explicitly, responders clearly have a different view than take authorities on what is fair in the power-to-take game. Responders typically view a take rate of 0% as fair, whereas the majority of take authorities who discuss fairness believe that a take rate of 50% is fair. Interestingly, perceptions of fairness are prone to the so-called self-serving bias, which occurs "when individuals subconsciously alter their fundamental views about what is fair or right in a way that benefits their interests" (Dahl & Ransom, 1999, p.703). Although the self-serving bias has been well established for individuals, it now appears that this phenomenon also shows up in group settings (see also Hennig-Schmidt, 2002). Apparently, individual biases concerning perceptions of fairness are not corrected by group discussions.

We find it somewhat surprising that only a small fraction of the subjects discusses fairness explicitly, given the emphasis put on fairness in the recent experimental literature (e.g. Fehr & Schmidt, 1999). Does this mean that only a small fraction of the subjects is concerned with fairness? For the take authorities this seems

plausible since most of them are concerned with maximizing own payoffs. For the responders, it is possible that fairness norms play an important role. If we assume that the revealed norms are shared between all responders, then most of them are treated unfairly. Perhaps these fairness norms play a role at a more subconscious level. But it is also possible that in this environment other motivations, in particular emotional urges, play an important role as well. For the responders, in an individual power-to-take experiment, BvW found evidence that negative emotions such as irritation and contempt are important for the decision to destroy. An important feature of emotional urges is that they "clamor for attention and for execution" (Frijda, 1986, p.78). Therefore emotions could easily overrule other considerations in the decision-making process, such as expressing one's views on fairness.

Finally, we briefly turn to the role of expectations, in particular those of the responders. Qualitatively, it appears that expectations play a similar role in our group experiment as in the experiment with individual decision-making. Expectations are important for the individual input for destruction, and thereby, for the group decision. In particular, responders who turn out to have been optimistic -- that is, when the take rate they are facing is higher than their expected take rate -- show an appetite for destruction. Surprisingly, though, responders in the individual experiment were on average too pessimistic (expecting a higher take rate than they actually got), whereas in this experiment responders were on average too optimistic. Why would that be? One reason for this difference could be that responders expect groups to behave in a more other-regarding way. On the other hand, our finding that responders typically perceive the take authority group as a single agent, would seem to run against this argument. Another reason may be that responders assume that groups destroy more easily than individuals and that take authorities take this into account when choosing a take rate. Obviously, this type of reasoning is more sophisticated because it includes the motivations of other responders in the group as well as those of the take authorities. Because expectations were assessed before responders came together to make the group decision, there was not any discussion on this issue among the responders. Moreover, with regard to the take authorities, we found that they also seem to consider the (opponent) responder group as if it were a single agent. Clearly more research is necessary to understand how expectations are formed in group settings. This can be done, for example, by letting responders collectively form (and discuss) their beliefs about the behavior of the take authority group.

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Appendix

Summary of individual data in the BvW experiment

Case (#)	Y_{take}	Y_{resp}	t (%)	d (%)	Case (#)	Y_{take}	Y_{resp}	t (%)	d (%)
1	15	15	0	0	21	15	15	70	0
2	15	15	0	0	22	15	15	70	0
3	15	12	0	0	23	15	15	70	0
4	15	13.5	25	0	24	15	13.5	70	30
5	15	15	30	0	25	15	15	70	0
6	15	15	30	0	26	15	15	70	0
7	15	15	30	0	27	15	15	70	0
8	15	15	35	0	28	15	15	70	100
9	15	15	40	0	29	15	15	70	100
10	15	15	50	0	30	15	15	70	0
11	15	15	50	0	31	15	15	70	0
12	15	15	50	0	32	15	15	75	100
13	15	15	50	0	33	15	15	75	0
14	15	13.5	60	0	34	15	15	80	0
15	15	15	65	0	35	15	9	80	99
16	15	15	65	0	36	15	13.5	80	100
17	15	15	65	0	37	15	15	90	100
18	15	15	65	0	38	15	15	90	0
19	15	15	66	0	39	15	15	100	100
20	15	15	66.7	0					

Note: Reproduced from Bosman & van Winden (2002). Y_{take} denotes the effort-task income of the take authority, Y_{resp} the effort task income of the responder (both incomes in guilders), t the take rate and d the part of Y_{resp} destroyed by the responder. Cases are ordered by the take rate.

Summary of the instructions of the power-to-take game

(translated from German; full instructions are available on request)

Show-up fee

This is 20 DM for all participants in the experiment. You keep the show-up fee, independent of the decisions taken in the experiment. The show-up fee is included in the calculation of your individual earnings at the end of the experiment.

Division in groups

The 6 participants A and B will in the course of the experiment be divided into two groups, A and B, such that in each group 3 persons decide together. The group decisions take place in different rooms and will be video taped. The allocation of individuals to groups will be described below.

Two phases

The experiment consists of two phases. In phase 1 only group A must make a decision whereas in phase 2 only group B must make a decision. Every participant, be it in group A or B, must make one decision. There are no other decisions that will follow.

Phase 1: group A chooses percentage
In this phase, each group A will be paired with a group B. This will be done by letting each participant A draw a coded envelope. With the help of the different codes, the 6 participants A and B will be divided into two groups, with three participants in each group. Every group A will be paired to a group B. Because of this procedure, both group A and B remain anonymous.

In the envelope, there is a form with a black box, which must be filled in by group A, and a grey box which must be filled in by group B (see specimen). In the black box of group A, we have filled in the total earnings of group B from the previous part of the experiment. Group A must fill in its own total earnings. Group A must then choose a percentage and fill this in on the form. This percentage determines how much of group B's total earnings after phase 2 will be transferred to group A. The percentage chosen by participant A must be an integer in the interval [0, 100].

The decision must be taken unanimously and then filled in on the form. All group members must agree by signing a separate form.

When the participants of group A have completed the form, it must be put in the envelope again. After this we will collect the envelopes and bring them to group B paired with group A by means of the code.

Phase 2: group B chooses percentage
In this phase group B has to fill in on the form which percentage of its total earnings will be destroyed. The percentage chosen by group B must be an integer in the interval [0, 100]. The decision must be taken unanimously and then filled in on the form. All group members must agree by signing a separate form. The transfer from group B to group A will be based on the rest earnings of group B that are left after destruction. Group B must transfer the percentage of their rest earnings chosen by group A.

When group B has completed the form, it must be put in the envelope again. After this we will collect the envelopes and bring them to group A, that is paired to group B, for their information.

Determination of individual earnings in part 2
Every member of group A always receives one third of its group earnings. For members of group B earnings are determined as follows. If all members of group B have the same earnings from part 1 of the experiment, then group earnings will be divided by 3. Every member gets one third of the group earnings. If the members of group B do not have the same earnings from part 1 of the experiment, then the group earnings from part 2 are divided proportionally. For example: two members have earned 20 DM and one member 10 DM in part 1. Assume that that the groep earnings from part 2 are equal to 25DM. This means that two members receive 10 DM and one member 5DM.

Code: …….

Decision Form

<u>GroupA</u> fills in this block:

Earnings group A: ..... DM.

Earnings group B: ..... DM.

We (Group A) decide that ……. % of the earnings of group B will be transferred to us.

<u>Group B</u> fills in this block:

We (Group B) destroy ……. % of our earnings.