Egalitarian vs. proportional voting in various contexts: An experimental study

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Abstract

The paper reports the results of series of experiments aimed at examining people's readiness to use proportional voting as opposed to traditional, egalitarian "one person-one vote" principle. With proportional voting we understand voting procedures where the number of votes per person are determined based on how much the outcome of the vote influences each voter. In one experiment, the participants where asked to vote on a number of issues using various voting procedures. In addition to the traditional "one issue—one vote" procedure, the participants were also offered two voting schemes that let them freely divide a pre-assigned total number of votes between issues in various ways. The participants were also asked to evaluate the issues to measure their stakes. In another experiment, the participants were asked to evaluate various voting procedures that pre-assigned votes to different voter groups depending on the stakes of these groups. The voting issues were hypothetical scenarios regarding municipal-level decisions about construction work. Participants evaluated proportional voting procedures more favorably when more information was available about the stakes of those involved in the voting process. The overall results show that, at least in experimental conditions, people are ready to use proportional voting and are equally satisfied with proportional and egalitarian voting procedures. However, the question remains open whether proportional voting schemes can realistically be introduced into real-life democratic process.

Keywords

Plural voting; Cumulative Voting; Democracy; Justice.

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Introduction

Several authors have pointed out the necessity for the modern democracy to consider the issue of voter stakes when deciding the issue on who has the voting rights (Harwood 1998, Heyd and Segal 2006, Zachariah 2006, Hortala-Vallve 2007, Brighouse and Fleurbaey 2010) and argued for a proportional ideal and corresponding systems of plural voting. These authors have mostly offered their arguments from a normative point of view, that is, trying to define a voting system that would be the most appropriate form the point of view of democratic theory. However, this approach has also been criticized from a normative point of view (Fudge and Quinn 2001, Petrén 2006). In addition, previous empirical research has shown that normative models may fail to predict actual human behavior when it comes to voting, bargaining and coalition formation (Kuklinski and Quirk 2000, Diermeier and Morton 2003).

At the same time, previous research has shown that stakes in various decision outcomes may systematically influence peoples' behavior in bargaining games and social dilemmas (Sutter 2002, Konow 2005, De Cremer 2007, Croson and Konow 2009). By extending these findings to voting contexts, one can predict that individuals' satisfaction with various voting systems, and their willingness to use such systems, should depend on the level to which these voting systems allow voters to accommodate their stakes in various issues being voted on. However, to our knowledge there do not exist any published studies that have directly compared people's reactions to voting schemes that explicitly take into account voter stakes, and the more familiar systems where each voter gets one vote.

Proportional voting is well-known in the corporate world, where the number of shareholder votes depends directly on the stakes of each shareholder. Also, semi-proportional voting systems exist in practically all democracies; e.g. in local elections non-local voters are often excluded from the vote. Cumulative voting schemes (where each voter can split a certain number of votes among several candidates or issues) have been implemented in specific political contexts (Brischetto and Engstrom 1997, Brockington *et al.* 1998), and have been shown to deliver economically optimal results in simulation studies and laboratory experiments (Casella 2005, Casella *et al.* 2006). However, most voting schemes employed in political contexts today are based on the one person-one vote principle, which we denote egalitarian voting in this paper.

In the light of normative arguments in favor of the proportional ideal in voting, the first aim of this study was to investigate to what extent explicitly proportional voting was acceptable to people, and to explore what were the patterns of behavior when people were given an opportunity for proportional voting. With proportional voting we understand a voting system where people can cast more than one vote on an issue or candidate when they meet certain qualifications, or under certain conditions. In this paper, we study people's reactions to two types of proportional voting. In the first experiment, we focus on cumulative (or storable) voting that allows voters to distribute a certain amount of votes among issues. In the second experiment, we examine the perception of plural voting, where people are assigned number of votes depending on their stakes in an issue.

In addition, in the second experiment we also look at the type of stakes that may influence people's perception of plural voting schemes. In particular, we compare people's reactions to positive (expressed as potential gains) and negative (expressed as potential losses) stakes as bases for plural voting. It has been shown that presentation of dilemmas as gain scenarios vs. loss scenarios can significantly influence people's responses to such scenarios—non-egalitarian principles (such as merit or need) are judged as more just when the dilemma is presented in a positive framing manner, such as allocation of good outcomes or withholding of bad outcomes (Gamliel and Peer 2006, 2010). In other words, people are less willing to accept non-egalitarian allocation principles when they involve a risk of loss to those

affected. These findings are in line with the general tendency towards loss aversion reported in the decision-making literature (Tversky and Kahneman 1981). To our knowledge, no studies have examined the effects of positive vs. negative stakes in voting contexts. Our second aim was to examine whether the principle of loss aversion would hold true for evaluation of egalitarian vs. proportional voting systems. If it did, it would have important implications for conditions, under which explicitly proportional voting systems are acceptable, and for the ways in which stakes should be defined for different voter groups.

1. Experiment 1

The aim of this study was to investigate whether people would use one type of proportional voting--cumulative voting--when given such a chance, and to compare their voting behavior with traditional, egalitarian voting schemes. Our hypothesis was that participants would use cumulative voting schemes when they had higher stakes in the issues being put on vote. The study consisted of an experiment where participants took part in a simulated referendum, and of a follow-up study where the same participants reacted to the results of that referendum.

1.1. Method

Participants for this study were 30 psychology students from Stockholm University who were asked to complete a questionnaire containing a simulated referendum of ten local political issues. The questionnaires were filled in by each student separately in facilities supplied by the Institution of Psychology at Stockholm University. The first page of the questionnaire asked for the participant's gender and age as well as which of the seven political parties in the Swedish Parliament the participant favored. Each participant was asked to use three different voting procedures in the referendum, with the choice to vote for or against the issue, or not to cast their vote at all. The three different voting procedures included a system of voting based on the egalitarian ideal and two systems of cumulative voting based on the proportional ideal. With the egalitarian system of voting (E10) each participant was allowed one vote per issue, which is the traditional way of voting. With the two cumulative systems of voting, participants were allowed to distribute their votes among the issues. With the first of the two systems of cumulative voting (P10) participants were allowed one vote per issue, but they were also allowed to "save" votes by choosing not to cast a vote, and use these on other issues. With the second system of cumulative voting (P100) participants were given 100 votes to freely distribute among the ten issues. The order of systems of voting, which each participant were presented with, was randomized so as to avoid any order effects. The ten political issues are presented in the results section.

After having used a system of voting, participants were asked to rate the system of voting in terms of justice and their satisfaction on a Likert type scale from one to ten, with one indicating "not at all just" and "not at all satisfied", and ten indicating "very just" and "very satisfied". On the last page of the questionnaire, participants were asked to rate the importance of each issue. The participants indicated the importance of each issue in relation to the other issues by giving the issue or issues with most importance a score of 100 and an issue or issues half as important as the most important a score of 50, and so on.

In the follow-up study, the same participants who participated in the initial study were approached via email. Participants were presented with the results of each of the three voting procedures. The results were displayed in three graphs without any information on which graph was a result of which voting procedure. Again, the order in which the graphs were presented was randomized so as to avoid any order effects. After each graph, participants were asked to rate how well the result reflected their own opinion on the ten issues. The rating was done with a similar

scale as the one used in the initial study, with one indicating "not at all" and ten "completely".

1.2. Results and Discussion

The results of the referendum and different systems of voting are displayed in Figures 1 to 3 (see Appendix 1). As seen in these graphs, the differences in results by the different systems of voting are relatively small. No result of a single issue shifted between for and against as a consequence of system of voting. The results can be interpreted as that the systems of cumulative voting based on the proportional ideal (P10 and P100) are capable of expressing a similar public opinion as is expressed through the traditional egalitarian system of voting (E10) within a homogenous group of voters. However, further statistical analyses (Chi-Square test) showed that the few percent shifts in proportion of votes were statistically significant on several occasions (that is, unlikely to have occurred simply by chance). Outcomes in the P10 voting system for issues Nr 1, 3, and 4 were significantly different from those in the E10 system, and outcomes in P100 voting system for issues Nr 1, 2, 4, and 6 were different from those in the E10 system. In addition, outcomes for issues Nr 2, 5, and 6 differed significantly between the P10 and P100 voting systems. This means that the shifts in voting outcomes were non-trivial on several occasions. Although they did not change the outcome of the votes in our experiment, these significant changes suggest that the use of a proportional voting system can change the outcome of a vote where the proportion of those in favor and against an issue is more balanced than in our experiment.

In addition, we also compared the average number of votes cast for and against each issue between the three voting systems. One-way dependent analysis of variance showed that the differences in results of questions 1 and 4 were significant ($F_{(2, 48)} = 9.035$, $p < .001$; $F_{(2, 48)} = 9.896$, $p < .001$). On both occasions, there was a significant increase in the number of "For" votes in both cumulative voting schemes (P10 and P100) in comparison with the egalitarian voting scheme (E10). The changes in the number of "Against" votes on these issues were not significant. Interestingly, the participants also evaluated these two issues as the most important ones (See Figure 4). It appears that at least for these two issues, the participants have indeed used the proportional voting systems to increase their influence because of their high stakes in these issues.

When looking at Table 1, one can see that question 1 and question 4 attracted most voters across all three voting systems. One can also see from Table 1 that the participation in voting is ranging from 77% to 93% with the E10-system, in contrast to a more widespread participation ranging from 50% to 87% with the P10-system and 57% to 83% with the P100-system. This means that in the cumulative voting schemes the participants have indeed used the possibility to abstain from voting on separate issues to use their votes on the more relevant issues. As one might have predicted, questions 4 and 7 gathered the largest number of votes because they are obviously important to the student population. An explanation to why question one has received much interest might be that the traffic fees have meant reduced fees for public transportation, which is a common way of traveling among students. Also, the introduction of traffic fees has reduced car traffic in central Stockholm, which affects students' living and traveling to central Stockholm in a positive way.

Regarding how the participants perceived the different systems of voting, the mean rating for justice and satisfaction are displayed in Table 2. The difference of these ratings are relatively small, although the E10-received slightly higher ratings than the other two systems. Further analysis showed that these differences were not statistically significant. It is interesting to note, though, that there was a clear tendency that participants with leftist political orientation evaluated the proportional voting schemes as more just, ($t_{(25)} = 1.981$, $p = 0,059$ (P10), $t_{(25)} = 1.957$, $p =$

= 0.062 (P100), and indicated higher satisfaction, t(25) = 2.152, p = 0.041 (P10), t(25) = 2.786, p = 0.10 (P100), with the proportional voting schemes than participants with rightist political orientation did There was no such difference for the egalitarian voting scheme. The mean differences for the proportional voting schemes were only marginally statistically significant (that is, from a mathematical point of view they could have occurred by chance), but they nevertheless indicate an interesting direction for further studies.

We were also interested to see if the importance of the different issues could be better expressed with the systems of voting based on the proportional ideal than the system based on the egalitarian voting principle. Figures from such an analysis are presented in Table 3, which shows how well the rating of importance for each question is correlated with voting behavior (i.e. choosing to vote contra not choosing to vote, as well as the number of votes given either for or against an issue). The table shows that P10 and P100 overall generates greater correlations than E10, except for question five, which shows no significant correlation at all between importance and voting behavior for any of the systems. Taken together, P10 seems to be most effective in expressing the importance of an issue with voting behavior, with P100 more effective than E10.

The purpose of the follow-up study was to examine which of the results better expressed the participants' opinion as a group. The mean rating of how well the result of the voting with E10 reflected participants' opinion was 6.46 (SD = 1.52, n = 28). Corresponding figures for P10 and P100 was 7.04 (SD = 1.29, n = 28) and 6.89 (SD = 1.55, n = 28). A one-way repeated-measures ANOVA showed that at least one of the differences between the three means was significant (F (1, 22) = 3.32, p = .045). That means that although the participants seemed to like the traditional, egalitarian voting scheme better when asked directly about it, they were more satisfied with the outcomes of both proportional votes. However, although these data mean that both systems of cumulative voting seem to work better as a tool for expressing public opinion than the traditional way of voting, these findings should at this stage be interpreted carefully as the differences between the three results of the different systems of voting were relatively small and close to non-significant.

Looking at the results as a whole, the system of cumulative voting indeed shows promise and the findings of this study should be considered sufficient enough to continue to explore the positive and negative outcomes of this type of proportional voting, most importantly in other settings (e.g. in elections of candidates) and with more differing groups of participants (suitably two groups of participants with opinions heterogeneous between them and homogenous within them), and see if these findings continue to hold.

2. Experiment 2

The second study focused on a different type of proportional voting—plural voting. The aim of this study was to investigate how information about the stakes of different voter groups would influence the evaluation of voting schemes that assign different influence to these voter groups. The voting schemes were constructed combining two principles: the all affected principle that excluded voter groups with no stakes or low stakes in the decision, and a principle of proportionality that assigned votes to the groups based on their stakes. In addition, we wanted to test whether the type of stakes—that is, whether they are expressed as potential gains or potential losses—would influence the evaluation of the voting schemes. Our hypothesis was that proportional schemes (and possibly schemes that exclude low-stake groups) should be more popular in loss scenario in comparison with neutral scenario, because respondents would think people who are facing a significant loss should be given more chance to avoid it. In the gain scenario, however, the egalitarian voting scheme should be more popular, because people who are gaining

significantly are already in a privileged situation and should not be given any additional privileges.

2.1. Method

Participants in this experiment were 102 psychology and education students from University of Latvia. Each participant completed a questionnaire about a fictitious scenario, in which city residents were given a chance to express their opinion about a new construction project in a local referendum. The situation was modeled after the current practice in Latvia, where a "public discussion" of each new project must take place, in which neighborhood residents can express their opinion for or against a particular project. Five different voting schemes were presented, where the number of votes assigned to each voter depended on how much the particular voter group would be affected by the construction (i.e., their stakes in the issue). The scenario and the five voting schemes can be seen in Appendix 2.

In addition, we used the so-called between-groups design to present three different versions of the same questionnaire to the participants (each participant completed only one version of the questionnaire). In the gain condition, the stakes were expressed as gains (i.e., the properties of some of the voters would appreciate in value after the construction). In the loss condition, the stakes were expressed as losses (the properties would depreciate after the construction). In the control condition, there was no information about the change of property prices, and the stakes were expressed simply in terms of geographical proximity of the voter group's residence to the construction cite.

The participants were asked to rank the five voting schemes in terms of in light of their personal views of fairness, wisdom, and the greater good of society.

2.2. Results and Discussion

Two questions were of interest when analyzing the results of this experiment. First, we wanted to know which voting schemes the participants evaluated as the most appropriate for the described situation. To answer this question, we compared the mean ranks of the five voting schemes (depicted in Figure 5). Statistical analysis (Friedman test) showed that voting scheme C (the most restrictive scheme) was the least popular, followed by voting schemes A (traditionally egalitarian) and B (moderately restrictive), which did not differ between them significantly. Scheme D (combination of exclusion and proportionality principle) and E (fully proportional scheme), which did not differ significantly between them, were the most popular ones. These results clearly show that participants preferred voting schemes that positively differentiated between groups with different stakes, assigning more voting power to groups with higher stakes.

The second question was to what extent the evaluation of voting schemes depended upon the information about the stakes provided in the particular questionnaire version. To answer this question, we conducted one-way analyses of variance, comparing responses of respondents who completed the three different questionnaire types, separately for each voting scheme. We found significant differences for two voting schemes: scheme B, $F(2, 101) = 4.04$, $p < .05$ and scheme E, $F(2, 101) = 10.2$, $p < .001$. Pairwise comparisons revealed that in both cases the statistically significant differences appeared between the control condition on the one hand, and gain and loss conditions on the other. In other words, the evaluations of the voting schemes did not differ between the participant groups who received information about the potential gain or loss to apartment owners in the scenario, but both groups evaluated scheme B lower than the control group, and scheme E higher than the control group did. The results suggest that it did not matter whether the stakes of the apartment owners were positive or negative, but it mattered that financial information about the stakes was provided at all, to influence the evaluations.

General Discussion

In general, the results of our studies show that people tend to use proportional voting systems when given such a chance (Experiment 1), and consider such a system appropriate under certain conditions when the stakes of the voter groups are clearly known (Experiment 2). The general tendency was that for more important issues (that is, for issues with higher personal stakes) participants used or preferred more votes in line with a cumulative voting system. In Experiment 1, the participants could determine their own stakes—that is, they were free to distribute votes among the issues. In real life, the situation would be more complex, because whoever organized the vote would have to decide which issues should be put together in one vote. The composition of the voting agenda would significantly affect the choices the voters would have to face. An important practical question would be, who would have the authority to compile the voting agenda? On the other hand, if this question could be solved, our results suggest that people might accept cumulative voting as a legitimate principle of making political decisions, and even be quite satisfied with the voting outcomes.

It is interesting to note that leftist participants tended to be more favorable towards proportional voting schemes than the rightist participants. This result is in line with Brighouse and Fleurbaey's (2010) prediction that egalitarians should embrace the proportional ideal as the most just system of voting. (This is assuming that leftist participants are also more egalitarian in their attitudes, as our previous research has shown (Dimdins and Montgomery 2005). However, the general political attitudes of participants in our experiments were not assessed, therefore this finding requires further research.)

The results of Experiment 2 suggest that people prefer plural voting systems that do not exclude any voter groups over voting schemes that exclude groups with no stakes or low stakes in the issue being voted about. Perhaps this reflects the general fairness concern—people may be averse to potential limitations of other people's rights. It appears that for the participants it was more important to give everyone a chance to participate in the decision making process, even if particular groups did not have explicit stakes in the issue being voted about. In contrast, people prefer to ensure that the stakes are reflected in the voting power by providing additional votes to the high-stake groups. This indicates that, under certain conditions, plural voting systems can be not only acceptable, but also preferable.

It is interesting to note that the overall support for the proportional voting schemes was stronger in Experiment 2 than in Experiment 1. One may speculate that this happened because in the plural voting schemes presented in Experiment 2 the voter stakes were clearly predefined. In contrast, the stakes in the cumulative schemes in Experiment 1 are not clearly defined. It is possible that the participants were concerned that with no clear stakes defined, the cumulative schemes can be in some way manipulated (so that the voting outcome does not reflect the true stakes of majority of voters). In other words, the participants used the cumulative schemes and were fairly satisfied with the voting outcomes, but they were not sure that other voters would use such schemes in a fair manner, which was reflected in the relatively lower evaluation of the cumulative schemes.

Our results did not confirm the prediction that there would be a difference between the votes of participants to whom the scenario was presented with negative stakes (loss condition) and of those who evaluated the situation with positive stakes (gain condition). For those proportional voting schemes that received the most positive evaluation overall (Scheme D and Scheme E) the mean differences between loss and gain conditions were in the expected direction, but they failed to reach a statistical significance. One may speculate, though, that with a larger sample size, and with more personally relevant stakes involved, future studies might find the difference predicted from the theory.

In our Experiment 2, the mere fact that some information—either positive or negative—was provided about the stakes of different voter groups, increased the popularity of the plural voting schemes. A possible explanation of this finding may be found in the notion of response compatibility (Tversky *et al.* 1988). This notion implies that people tend to prefer a graded response (here graded votes) the more the input is graded (here in terms of information about the monetary value of the outcomes).

The present result illustrates how important it is to clearly estimate and define the stakes of groups and individuals if plural voting schemes are to be used. This, of course, emphasizes the practical problem pointed out by Petrén (2006) and acknowledged by Brighouse and Fleurbaey (2010)—that an important obstacle to proportional ideal is a lack of procedure for defining the stakes of all those involved in the voting process. For this normative ideal to work, everyone must perceive the definition of stakes as fair.

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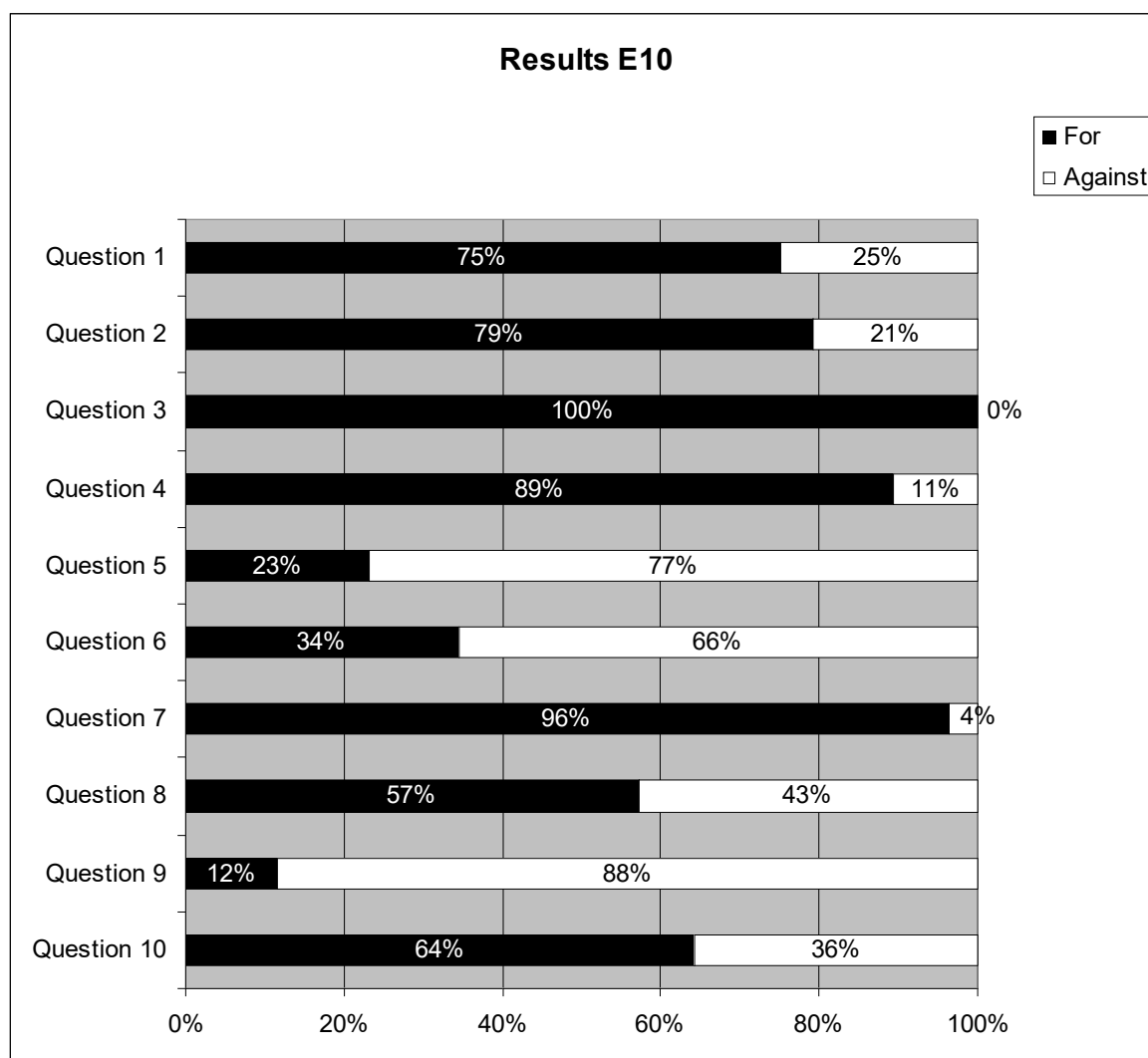
Appendix 1. Figures and Tables

Figure 1. The graph displays the results of the referendum of the ten issues using E10 as voting system.

1. Introduce special taxes for car traffic going in and out of central Stockholm
2. Building of a traffic route around central Stockholm (to reduce traffic in central Stockholm)
3. Building of the so called Citybanan (a new railway track going beneath central Stockholm, increasing the capacity of train traffic by the double)
4. Introduce a discount on collective transports in Stockholm for university students
5. Transform publicly owned tenements to privately owned tenements in Stockholm
6. Introduce written judgments of students from the first school year (as an alternative to grades. Today students get grades from their eighth school year in Sweden) in schools in Stockholm
7. Give public financial support for building of small and inexpensive tenements in Stockholm
8. Increase the number of surveillance cameras in public places in Stockholm
9. Privatization of hospitals in the Stockholm area

10. Introduce a so called vårdnadsbidrag (a public subsidy for parents who choose to stay home and take care of their children instead of placing them in publicly owned day nurseries) in Stockholm
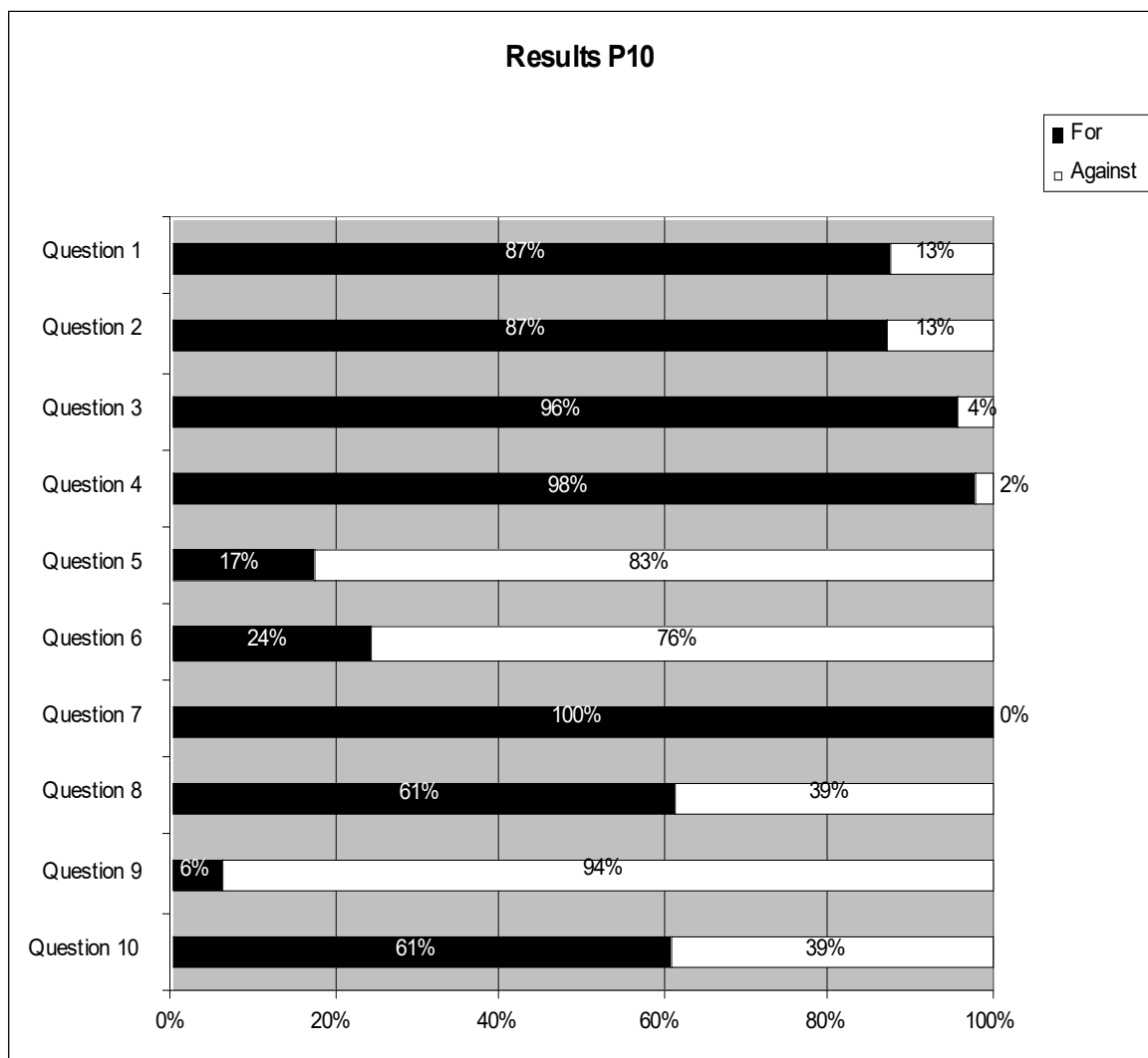
Figure 2. The graph displays the results of the referendum of the ten issues using P10 as voting system.

1. Introduce special taxes for car traffic going in and out of central Stockholm
2. Building of a traffic route around central Stockholm (to reduce traffic in central Stockholm)
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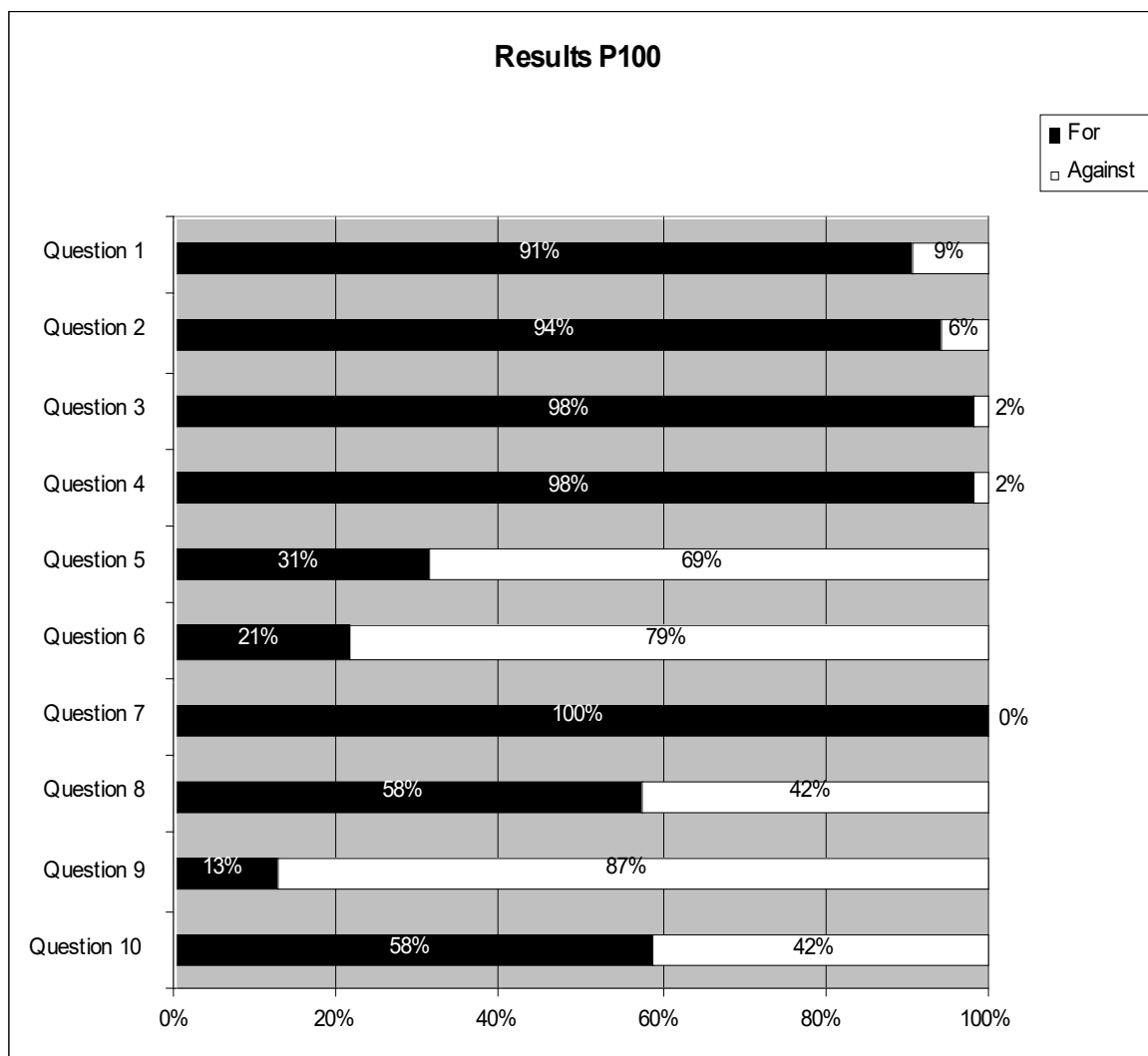
Results P100

Figure 3. The graph displays the results of the referendum of the ten issues using P100 as voting system.

1. Introduce special taxes for car traffic going in and out of central Stockholm
2. Building of a traffic route around central Stockholm (to reduce traffic in central Stockholm)
3. Building of the so called Citybanan (a new railway track going beneath central Stockholm, increasing the capacity of train traffic by the double)
4. Introduce a discount on collective transports in Stockholm for university students
5. Transform publicly owned tenements to privately owned tenements in Stockholm
6. Introduce written judgments of students from the first school year (as an alternative to grades. Today students get grades from their eighth school year in Sweden) in schools in Stockholm
7. Give public financial support for building of small and inexpensive tenements in Stockholm
8. Increase the number of surveillance cameras in public places in Stockholm
9. Privatization of hospitals in the Stockholm area
10. Introduce a so called vårdnadsbidrag (a public subsidy for parents who choose to stay home and take care of their children instead of placing them in publicly owned day nurseries) in Stockholm

Table 1. Number of participants who chose to vote in each issue organized by system of voting.				
		System of voting		
		E10	P10	P100
Question 1		93%	87%	83%
Question 2		80%	60%	57%
Question 3		77%	60%	70%
Question 4		93%	87%	87%
Question 5		87%	70%	77%
Question 6		97%	60%	67%
Question 7		93%	80%	80%
Question 8		93%	50%	67%
Question 9		87%	77%	70%
Question 10		93%	73%	70%

Table 2. Means (and standard deviations) for ratings of justice and satisfaction, in terms of system of voting

Rating	System of voting		
	E10	P10	P100
Justice	6.87 (2.11)	5.70 (2.54)	5.97 (2.67)
Satisfaction	6.83 (2.17)	5.90 (2.45)	6.07 (2.74)

Table 3. Correlations between rating of importance and the number of votes, in terms of system of voting.

	System of voting		
	E10	P10	P100
Question 1	.124	.392*	.489**
Question 2	.237	.401*	.472**
Question 3	.500**	.628**	.534**
Question 4	.129	.279	.238
Question 5	-.048	-.043	.024
Question 6	.166	.486**	.280
Question 7	-.184	.202	.036
Question 8	-.131	.192	-.013
Question 9	.119	.248	.324
Question 10	.109	.580**	.198

*Correlation is significant at the 0.05 level
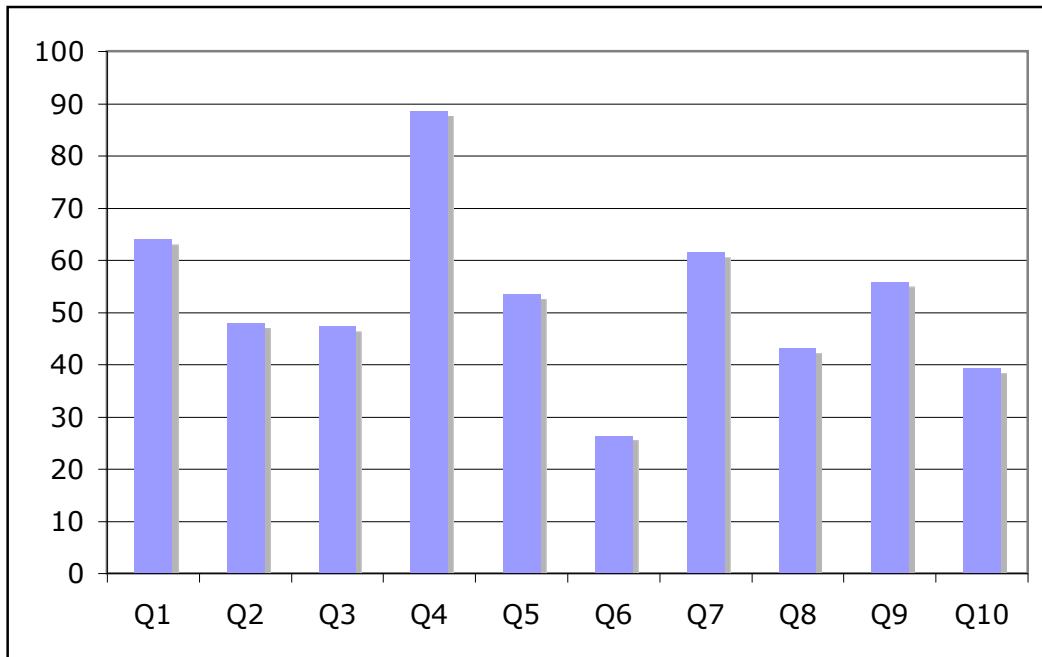** Correlation is significant at the 0.01 level

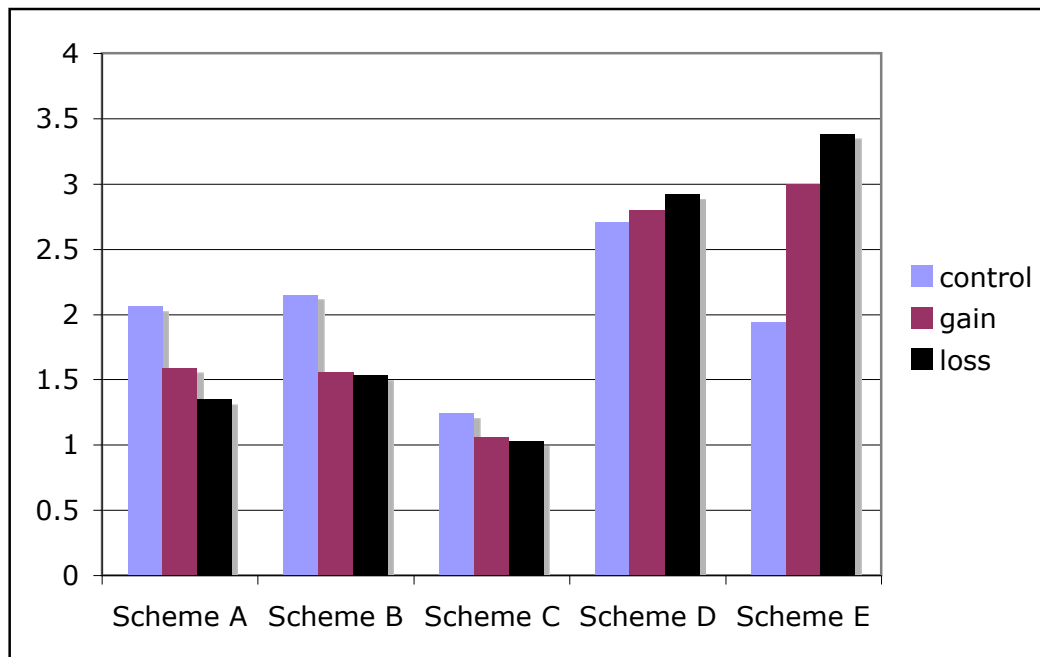Figure 4. Mean importance of the ten issues in the referendum (N = 30)

Figure 5. Mean evaluation of the five voting schemes in control, gain, and loss conditions (reversed ranks; higher number indicates more favorable evaluation)

Appendix 2. Scenarios used for Experiment 2

Control condition

Imagine that a new housing complex is about to be built in a city neighborhood. The law requires that the city residents have an opportunity to express their opinion about any new building projects. Several voting schemes have been proposed to ensure that those people most affected by the construction have their say on the matter. Below you will see a number of voting schemes, with various assignments of votes to different population groups. In each voting scheme, numbers in the cells correspond to the number of votes given to each voter in the respective group. Number „1" means that each voter in the group has one vote on the issue. „0" means that the respective group is not included in the vote on the issue, i.e. its members have no votes. „2" means that each member of the respective group has two votes on the issue; „3" means that each voter in the respective group has 3 votes.

In light of your personal views of fairness, wisdom, and the greater good of society, please rank-order the following voting schemes starting from the most appropriate for this case to the least appropriate.

	Scheme A	Scheme B	Scheme C	Scheme D	Scheme E
Residents living in the block(s) adjacent to the construction site	1	1	1	2	3
Residents living in the administrative district where construction is planned, but not in adjacent blocks	1	1	0	1	2
Residents of all other city districts	1	0	0	0	1
Rank:					

Loss condition

Imagine that a new industrial park is about to be built in a city neighborhood. The construction will reduce the market value of apartments in that neighborhood significantly because of increased traffic, noise, and possible pollution. The law requires that the city residents have an opportunity to express their opinion about any new building projects. Several voting schemes have been proposed to ensure that those people most affected by the construction have their say on the matter. Below you will see a number of voting schemes, with various assignments of votes to different population groups. In each voting scheme, numbers in the cells correspond to the number of votes given to each voter in the respective group. Number „1" means that each voter in the group has one vote on the issue. „0" means that the respective group is not included in the vote on the issue, i.e. its members have no votes. „2" means that each member of the respective group has two votes on the issue; „3" means that each voter in the respective group has 3 votes.

In light of your personal views of fairness, wisdom, and the greater good of society, please rank-order the following voting schemes starting from the most appropriate for this case to the least appropriate.

	Plan A	Plan B	Plan C	Plan D	Plan E

A resident living in the block adjacent to the construction site whose apartment will depreciate by EUR 20.000 as a consequence of the construction	1	1	1	2	3
A resident living in the administrative district where construction is planned, whose apartment will depreciate by EUR 2.000 as a consequence of the construction	1	1	0	1	2
A city resident whose apartment's value will not change	1	0	0	0	1
Rank:					

Gain condition

Imagine that a new industrial park is about to be built in a city neighborhood. The construction will increase the market value of apartments in that neighborhood significantly because of improved infrastructure, increased interest of real estate dealers and influx of high-profile businesses. The law requires that the city residents have an opportunity to express their opinion about any new building projects. Several voting schemes have been proposed to ensure that those people most affected by the construction have their say on the matter. Below you will see a number of voting schemes, with various assignments of votes to different population groups. In each voting scheme, numbers in the cells correspond to the number of votes given to each voter in the respective group. Number „1" means that each voter in the group has one vote on the issue. „0" means that the respective group is not included in the vote on the issue, i.e. its members have no votes. „2" means that each member of the respective group has two votes on the issue; „3" means that each voter in the respective group has 3 votes.

In light of your personal views of fairness, wisdom, and the greater good of society, please rank-order the following voting schemes starting from the most appropriate for this case to the least appropriate.

	Plan A	Plan B	Plan C	Plan D	Plan E
A resident living in the block adjacent to the construction site whose apartment will appreciate by EUR 20.000 as a consequence of the construction	1	1	1	2	3
A resident living in the administrative district where construction is planned, whose apartment will appreciate by EUR 2.000 as a consequence of the construction	1	1	0	1	2
A city resident whose apartment's value will not change	1	0	0	0	1
Rank:					