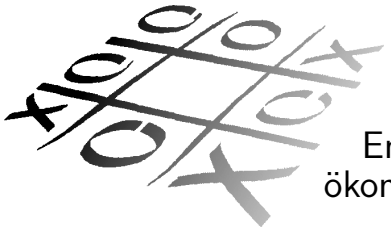

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Strategic Voting in Multiparty Systems: A Group Experiment

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Abstract

The paper tests the theory of strategic voting for multiparty systems with proportional representation and coalition governments at the micro-level. The study focuses in particular on the question whether participation in repeated elections allows voters to learn from experience and enables them to optimize their decision behavior. An economic group experiment with decision scenarios of varying degrees of difficulty was used to test decision making at both the individual and group level. The results suggest that a majority of voters were able to pursue successful decision strategies and that the difficulty of the decision scenarios affected the voting performance of the participants as expected. However, a learning effect is not supported by the data.

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Strategic Voting in Multiparty Systems: A Group Experiment

The theory and experimental research on strategic voting, defined as casting a vote for a party other than the most preferred party in order to best influence the election outcome (see Cox 1997, Fisher 2004), has focused predominantly on the classic case, single member districts with three candidates. Multiparty systems with proportional representation and coalition governments are usually considered to offer insufficient incentives for strategic voting. Because most elections in parliamentary democracies produce legislatures with more than three parties, coalition governments are a typical outcome.

There is compelling evidence, however, that strategic voting is far from unknown in these political systems. Aggregate-level voting patterns as well as individual-level survey research suggest that a non-trivial share of voters engage in strategic voting, given the appropriate circumstances (e.g., Abramson et al. 1992, Alvarez and Nagler 2000, Alvarez, Boehmke, and Nagler 2006, Blais et al. 2001, Fisher 2004, Gschwend 2007, Hermann and Pappi 2008, Lanoue and Bowler 1992, Niemi, Whitten, and Franklin 1992).

Strategic voting in multiparty systems is complex because its goal is not (just) to produce a single "winner" in a single member district. In fact, different mechanisms can have quite different effects on government formation. Strategic voting can influence (1) which party passes, or fails to pass, a minimum vote threshold for representation, (2) which parties are able (or strong enough) to form coalitions, and (3) the relative weight of parties within coalitions. As a consequence, a vote for any party or even abstention might represent the optimal decision in a given electoral context (Meffert and Gschwend 2007).

Given the complexity of this decision task combined with well-known doubts about the political sophistication of the electorate (Zaller 1992), it might appear unlikely that the average voter would be able to engage in successful strategic voting. In addition, even if it is possible in survey-based research to identify voters that cast a ballot for a party other than the most preferred party, it is nearly impossible to confirm a decision process as postulated by the theory of strategic voting. This leaves experimental studies as the method of choice to test the logic of strategic voting at the micro-level. So far (as far as we know), only three economic strategic voting experiments have explicitly addressed the aspect of coalition governments in multiparty systems (Goodin, Güth, & Sausgruber 2008; McCuen & Morton 2002; Meffert & Gschwend 2007). Goodin, Güth, and Sausgruber (2008) find mixed support for strategic voting, but their decision to assign to participants (or mix) both voter and party (leader) roles makes this study not a good test. McCuen and Morton (2002), on the other hand, find support

for their *tactical coalition voting* (TCV) model. The choice set in this study included only three parties and thus just barely models a multiparty system, rendering the coalition formation aspect rather trivial. Finally, Meffert and Gschwend (2007) also found support for strategic voting. In their *strategic voting game* (SVG1), participants faced 25 independent decision scenarios with four parties in a two-dimensional policy space. On average, half of the decisions were optimal, depending on the difficulty of the decision task and the availability (and quality) of pertinent information such as polls and coalition signals. This study further suggests that voters can rely on simple heuristics such as coalition signals and the distance, isolation, and strength of parties to optimize their vote. On average, these heuristic strategies make sense, but they are very risky and prone to failure without additional reliable confirmatory evidence such as polls.

One key aspect, however, is missing. Strategic voting is essentially a coordination problem in which voters take into account the behavior of others to decide on an optimal course of action. This coordination requires information about the likely behavior of other voters. The most obvious source are polls that are widely available before national elections. The pundits in the media usually add comments and interpretations that should help even disinterested voters to draw some basic conclusions about the outcome of the upcoming election. What is easily overlooked, however, is the fact that most voters already have considerable experiential knowledge. As Lewis-Beck and Skalaban (1989) point out, voters as members of a polity usually have no difficulty to forecast the general outcome of an election. Forsythe and colleagues (1993) note that election histories, the results of previous elections including winners and/or incumbents, are among the various pieces of publicly available information that can facilitate strategic voting. Previous elections provide voters not only with information about the general strength of parties but also which coalition governments are likely to be formed after elections. In short, voters (can) learn from experience. Needless to say, the past is not always a perfect predictor of the future, but a reasonable starting point. Combined with poll information, the average voter should have sufficient information for strategic voting. As a consequence, the main purpose of this experiment is to investigate coordination and learning effects in repeated elections in more detail.

Strategic vs. Optimal Voting

The key assumption of the rational voter paradigm is that voters cast a strategic vote to maximize their expected utility by producing the optimal outcome. By definition, strategic decisions can involve all parties except the most preferred party. Because a sincere vote for

the most preferred party will often be the best decision, it is useful to classify all decisions—sincere, insincere, or strategic—as optimal whenever they lead to the best possible outcome for the voter. Group decisions, however, make the evaluation of individual decisions rather complex. The basic idea is straightforward. The effect of individual vote decisions, whether they are optimal or not, cannot be evaluated in isolation. The whole electorate determines the election outcome, and depending on the behavior of the other voters, an individual vote decision might have very different consequences. In one case, a strategic vote might produce the optimal outcome for a given voter, but in another situation, the same vote might actually have negative consequences. In short, individual vote decisions can only be evaluated conditionally.

The interdependency of individual (voter) and group (electorate) has additional consequences. For example, maximizing expected utility from individual and group perspective can be a compatible goal that requires complementary strategies. But it is also possible that these goals conflict with each other and require different and opposite strategies. An optimal outcome for the group overall will often require sacrifices from individual group members. Or in other words, individually optimal (egoistic) behavior might hurt the other voters.

As a consequence, incompatible individual and group goals can produce a variety of stable outcomes when individually optimal decisions might be suboptimal for the whole group. From a game theoretic perspective, this would happen whenever individual decisions produce a Nash equilibrium. It can be optimal for the group overall as well, but more often it will settle at some suboptimal level. From the decision-theoretic perspective, the question is simply whether individual voters are able to maximize their expected utility given the behavior of the other voters in the electorate. But even under the best of circumstances—with full information about the distribution of party preferences and the rules of government formation—voting remains a decision under uncertainty.

Voting as a Repeated Game

The discussion above makes it clear that strategic voting is an extremely complex process that would appear to be outside the cognitive capacities of the average voter. The evidence suggests, however, that voters are frequently able to make optimal decisions under these circumstances. One way to explain this behavior is to point to the use of simple heuristics that simplify complex decision contexts by relying on simple shortcuts (Meffert and Gschwend 2007). More important, however, is the simple fact that most elections do not pose

a complete riddle to voters because they have participated before in elections. They know the parties and typical governments. They are familiar with the political system and can rely on their experiential knowledge to cast votes. Voting in elections is a repeated behavior, and voters "learn" over time what works and what not. Clearly, this knowledge is fundamental knowledge and will not be able to explain individual elections. A strategic voter will have to rely on short-term information such as polls and coalition signals by parties to supplement the long-term knowledge to cast successful strategic votes. Strategic voting is, figuratively and practically speaking, a repeated game in which participants (voters) can learn from experience and try to optimize their behavior. This conceptual idea can be translated quite literally into an experimental framework, an economic group experiment with repeated measures (vote decisions).

Purpose of Study

The goal of this study is to put the theory of strategic voting to an empirical test at the micro-level. By asking participants to make repeated decisions in different election scenarios, we can test (1) whether voters have the ability to make optimal decisions in complex multiparty systems and (2) how trade-offs between individual and group-level decisions and outcomes are resolved.

Strategic Voting Game 2

In order to test strategic voting in multiparty systems in an experimental study, the study design has to construct decision scenarios that capture several key characteristics of multiparty systems. More specifically, they have to include at least four parties, proportional representation with a minimum vote threshold, and coalition governments. These characteristics create a party system with multiple, non-trivial opportunities for coalition formation. To enable strategic voting, voters have to know their own party and/or policy preferences, the strength of the parties, and any coalition announcements or commitments by the parties. Finally, voters must know how governments are formed.

With these requirements in mind, we developed a second *Strategic Voting Game* (SVG2) in which four parties compete for 11 voters in a series of repeated elections. The "electorate" encompasses seven potential swing voters, played by participants in the experiment, and four fixed or "habitual" voters, one for each party. Participants encountered

three election scenarios of varying levels of difficulty, each involving a series of five repeated elections. Government formation followed four sequential rules:

1) *Absolute Majority*: A party with more than 50% of the seats wins. If no party obtains an absolute majority, the formation of a coalition government with an absolute majority is necessary.

2) *Coalition Signal*: Parties that sent out a positive (pairwise) coalition signal have priority during government formation. Parties with a negative coalition signal can never form a coalition.

3) *Minimum Winning Coalition*: If two or more coalitions have an absolute majority and the same coalition signal, the coalition with the lowest seat share wins.

4) *Random Sequence*: If two or more coalitions have an absolute majority, the same coalition signal, and an identical seat share, the winning coalition is determined by a random party sequence (see below) that is generated before each election round.

In case all four rules fail to produce a government, the election ends in a stalemate and no payoffs for the voters. If successful, the government determines the payoffs of the voters (as explained below).

Because each party has a fixed "voter base" of one simulated voter, the remaining seven members of the electorate, and potential "swing voters," are used to created the decision scenarios. The seven voters are assigned voter profiles that operationalize party preferences as numerical payoff points. The most preferred party is assigned 10 points, followed by 7, 3, and 0 points for second, third, and least preferred party. Due to an additional restriction, only eight different voter profiles are possible. As Figure 1 shows, the four parties A, B, C, and D are arranged as a rectangle, and the party diagonally opposite from the most preferred party is always the least preferred party. For example, a voter with B as first preference will always have C as the least preferred party while either A or D can be the second (and third) preference.

Three scenarios were tested in the experiment. These scenarios were developed to create decision scenarios of varying difficulty. The first scenario, labeled "Germany" due to an accidental resemblance to an existing political system, presents two party blocks, each consisting of a large and a small party. In a sincere electorate, parties A and C will form a government because they have both a positive coalition signal and the required absolute majority. Supporters of parties B and D will have a larger incentive to consider strategic voting in order to obtain a better outcome. A government involving B and/or D is only possible if a supporter of A or C defects from these parties. For the electorate as a whole, an

absolute majority of C will produce the maximum payoff. Overall, this scenario provides a transparent decision scenario that suggests fairly straightforward decision strategies. However, because it is rather difficult to elect a different government, there are considerable obstacles to successful strategic voting.

In the second scenario ("Sweden"), a single dominant party faces a fragile alliance of three small parties. In a sincere electorate, the party alliance wins but produces a suboptimal outcome that is undesirable for nearly all voters. In short, there are considerable pressures and opportunities for strategic voting. The optimal outcome for the electorate as the whole as well as six of the seven swing voters is an absolute majority of A. Only a single strategic voter is required to produce this outcome. But the election of A depends on coordination. The four supporters of party A have to stick with their preferred party (despite "losing" in the default outcome with a sincere electorate) and either the supporter of party B or party C has to vote for his or her second preference A. If voters understand this coordination problem, the optimal decision strategies should be fairly obvious.

The third scenario ("Netherlands") is by far the most difficult scenario. The parties are of similar strength and the coalition signals do not help to resolve government formation. In a sincere electorate, the only coalition with a positive signal does not have a majority, forcing the three parties with neutral signals to form a two-party coalition. Because all three parties are of similar strength, the minimum winning coalition rule does not help. Thus, the "random sequence" is required to determine which two-party coalition will emerge as the winner (given a sincere electorate). The random sequence is produced before each election and lists the four parties in a random order. In a tie of two or more coalitions with the same coalition signal and similar strength, the first party in this sequence that uniquely identifies one of the tied coalitions will determine the winning coalition. Given this high degree of uncertainty in this scenario, strategic voting can easily have decisive effects. However, determining the optimal strategy is extremely difficult. For the electorate as the whole, an absolute majority of C is optimal.

Voters participate in a series of five repeated elections in each scenario. After each election round, individual payoffs are determined by the preference values of the parties in government. For single party governments, the payoff is equal to the individual preference value for that party. For coalitions, the payoff is the average of the preference values of the coalition parties, *weighted by the number of votes obtained in the election*. Thus, even if a voter cannot change a coalition government, he or she might still be able to influence the weight of the parties in that coalition, thereby maximizing the individual payoff.

Voters always know the coalition signals as well as the distribution of the first preferences of all voters in a given scenario. This information is presented as a party matrix and a "poll" and does not change during the five repeated elections in a given scenario. However, the amount of information available to voters varies. Under full information, participants also have knowledge of the random sequence as well as the distribution of second preferences of all voters. Under incomplete information, neither the random sequence nor the second preferences of the other voters are known.

In order to prevent supergame effects and to insure approximately equal opportunities to earn payoff points, voter profiles were exchanged randomly before each election round. Thus, while voter profiles remained constant, each profile was assigned to a different participant before each election.

Laboratory Experiment

Participants

Participants for the experiment were recruited by email from the participant pool of the experimental laboratory of the Collaborative Research Center (SFB 504) at the University of Mannheim, Germany. The average age of the 280 participants was 24 years, ranging from 19 to 47 years, and 48.2% were male. Most participants were students enrolled in a variety of majors, most frequently in business, economics, and social sciences.

Procedure

At the beginning of each session, one or two groups with seven participants were seated at separate computer terminals and given a short verbal introduction, announcing that each participant would play with six other participants in a group game. Participants were told how payoff points would be converted in a cash payoff at the end. The study continued with a detailed explanation and instructions for the voting game on the computer screen. It concluded with a quiz of six-questions that tested and reinforced the knowledge and understanding of the rules of government formation (each question was followed by an explanation of the correct answers) (The full game instructions are documented in the Appendix).

After all participants in a group had finished the quiz, a training session with one scenario and five repeated elections started. The training session was followed by the experimental session. Participants encountered the three scenarios discussed above in

randomized order, with five repeated elections each. In all sessions, participants had initially 60 seconds to view a new election scenario (poll, coalition signals, and preference profile). The party matrix combined three pieces of information, coalition signals by the parties, the individual party preferences, and (optionally) the distribution of second preferences of all voters. The lines connecting the four parties were used to indicate the pairwise coalition signals. Thick black lines indicated a positive signal (priority during government formation), a thin dashed line a neutral signal (coalition possible), and two red separation marks instead of a connecting line indicated a negative signal (no coalition possible). In each party box, participants saw their current preference values. The most preferred party was additionally highlighted with a dark green background and the second preferred party with a light green background.

In scenarios with full information, the random sequence to break potential ties during government formation was visible below the poll. In these cases, participants could also click on the party boxes in the preference and coalition signal matrix to make the distribution of second preferences visible (Figure 1 shows the three scenarios with incomplete and complete information).

After the voting booth opened, participants had 60 seconds to cast their vote. A failure to vote in time was counted as abstention. After all group members had cast their vote, the result of the election (seats in parliament, government, decision rule, and individual payoff) were shown for 20 seconds (see Figure 2). Before subsequent election rounds in the same scenario, participants had 20 seconds to view and familiarize themselves with their newly assigned preference profiles before the voting booth opened again. On average, individual decisions required 6.0 seconds (SD=7.9, Median=3), and only 4 out of 5600 decisions were not made in time. At the group level, decisions took on average 17.7 seconds (SD=11.6, Median=15).

Participants earned payoff points based on the government formed after each election. It was calculated as the weighted average of the preference values of the parties in government and ranged between 0 and 10 points. At the end of the study, the payoff points were converted into a cash payout in Euro (1 payoff point = 12 Cents).[1] A minimum payoff of €4 was guaranteed for completing the voting game and answering a short questionnaire. The average payoff was €9.80 (about $15).

[1] The conversion rate in one pilot session was slightly higher (.14). Given no evidence of deviating decision behavior, the pilot session data is combined with the other session data for the analyses.

After the last election, participants filled out a short questionnaire. It started with an open question about the decision strategy. After a few demographic questions, participants first responded to a short version of the need for cognition scale (Cacioppo and Petty 1982; agreement with 12 items about problem solving; $\alpha = .79$), followed by an open-ended 13-item political knowledge scale (Zaller 1992), asking about the jobs of various public officials (and vice versa) and some questions about the political system ($\alpha = .80$). Participants were thanked for their participation, debriefed, and collected their payoff upon leaving the lab. Participation took on average 61 minutes.

Results

Group-Level Results

The analysis starts with an assessment of the voting behavior at the group level before focusing on individual decision making at the micro-level. A first indicator of the actual difficulty of the decision scenarios is the last rule used during government formation. Table 1 indicates that single-party governments occurred in about a quarter of the elections in "Germany" (24.5%) and "Sweden" (30.0%), but not very often in the "Netherlands" (10.8%). The coalition signal clearly dominates government formation in "Germany" (72.0%) and "Sweden" (37.5%) but also affected a substantial number of elections in the "Netherlands" (37.8%). In "Germany," only six elections ended with a minimum winning coalition, and one election ended in a stalemate. As expected, these election outcomes suggest a highly transparent scenario. In "Sweden," the minimum winning coalition decided every fourth election (26.5%), and eleven elections required the random sequence to resolve ties (one election ended in a stalemate). This pattern of results suggests that government formation was somewhat more complicated. As expected, the "Netherlands" were the most difficult scenario. Two out of five elections were decided by a minimum winning coalition, and the random sequence was required in 11.4% of the elections. It should be noted that while the pattern of results clearly follows the intended differentiation by difficulty, the relatively rare application of the random sequence during government formation works against any information effect (manipulated visibility of the random sequence). Knowledge of the random sequence was intended to give participants an advantage in predicting the next government and help them to optimize their decision behavior. This is hardly possible if the random sequence is not or only rarely applied.

A key indicator of the success and failure of electoral behavior is the overall payoff obtained by the groups. Figure 2 shows the (density) distributions of group payoffs for the three scenarios. Vertical lines indicate the default or baseline payoff of a sincere electorate. In the "German" scenario, the groups did not systematically improve or worsen the baseline payoff. The mostly unimodal distribution of the group payoffs peaks around the default payoff. In "Sweden," the groups overwhelmingly succeeded in improving the group payoffs over the low default payoff. However, the distribution is clearly bimodal with a large gap between those elections that resulted in the optimal single party government (A) and those that merely optimized the coalition government. In the third and most difficult scenario ("Netherlands"), the groups overwhelmingly worsened the default outcome, and the fairly flat unimodal distribution suggests no stable election outcomes. Overall, the three scenarios show the expected pattern of results.

In order to investigate any differences due to full and incomplete information and to identify any learning effects across repeated elections, it is necessary to differentiate the payoffs by election round and information condition. Figure 4 summarizes the results for "Germany" in a bubble plot. The size of the bubbles indicates the relative frequency of the realized group payoffs. The solid horizontal line indicates the default group payoff of a sincere electorate while the dashed horizontal lines indicate possible Nash equilibria.[2] The average group payoffs for elections with full and incomplete information are shown as squares and triangles, respectively. These averages fail to indicate both a learning effect and an information effect. The averages fluctuate slightly but mostly stay close to the default payoff. The results for "Sweden" (Figure 5) are very similar. In fact, the figure suggests a slight downward trend, with groups not only increasingly failing to obtain the optimal group payoff but also producing a few very bad outcomes. The "Netherlands" scenario (Figure 6) follows the other two by failing to show any information effect, even though the group payoffs show a very slight upward trend. In short, the group payoffs do not show the expected learning and information effects.

Group payoffs, however, are not necessarily the best indicator of success and failure of individual decision strategies. A more appropriate indicator for this purpose is the number of voters in the electorate that made an optimal vote decision. An optimal vote decision is given

[2] Due to the game design, any single-party government with an absolute majority plus one vote represents a Nash equilibrium. These equilibria also delimit the highest and lowest possible group payoff. Additional Nash equilibria are possible and are mostly associated with positive coalition signals. However, they do not always exist.

if a voter could not improve his or her payoff by casting a different ballot (while holding the vote decisions of the other voters constant). Figure 7 summarizes the results for all three scenarios. The "German" scenario has the highest share of optimal vote decisions, followed as expected by "Sweden" and the "Netherlands." While the success rate in "Germany" does not show a clear trend, the averages for "Sweden" and the "Netherlands" show marginal improvements from first to last election round. These improvements, however, do not reach statistical significance.

In summary, the group level results suggest that the scenarios were successful in creating decision scenarios of varying difficulty, but that the expected information and learning effects failed to materialize.

Individual-Level Results

Group-level results, however, allow only very limited inferences about voting behavior at the individual level. As a consequence, the following analyses focus on the latter. Table 2 provides a first impression by summarizing vote decisions by party preference for the three scenarios. It demonstrates that the assigned party preferences had the intended effect. Over half of all decisions (58.4%) were a sincere vote for the preferred party, including two thirds of vote decisions in "Germany." About a third of all insincere decisions were in favor of the second preference. This decision is most notable in "Sweden" (37.9%) and reflects the relatively transparent strategic decisions to reach an optimal outcome, at least as implied by the default scenario. Third and fourth preferences as well as abstentions were infrequent choices. It should be noted that despite the strong trend towards sincere voting in the "German" scenario, the third preference was chosen most frequently (7.9%) among the three scenarios. We will return to this finding below.

More informative than voting by preferences is the classification of vote decisions according to their success and failure. Table 3 differentiates the (insincere) strategic decisions according to winning, neutral, and losing outcomes (by comparing the realized payoffs with the hypothetical payoffs of a sincere vote for the first preference). Among all strategic decisions, "bad" decisions are most frequent (18.3%), followed by "winning" (14.6%) and inconsequential (8.7%) decisions. This pattern suggests that strategic voting has a mixed success rate, with the least mistakes in the most transparent "German" scenario (14.9%).

The classification in sincere and strategic voting does not indicate whether these decisions were optimal (that is, obtained the highest possible payoff for an individual voter while holding the actual voting behavior of the other voters constant). While strategic votes

that produce a loss (compared to a sincere vote) can never be optimal, all other strategic and sincere decisions can be optimal. The second column for each scenario in Table 3 shows the share of optimal decisions for (or within) each category. These results suggest a different interpretation of success and failure of the decisions. Two-thirds of the sincere decisions in "Germany" and "Sweden" were optimal, and even strategic decisions without any effect on payoffs were optimal in 48.8% and 73.3% of the decisions, respectively. In short, the majority of decisions in these two scenarios were optimal (61.8% and 56.1%, respectively). As the most difficult and challenging scenario, the "Netherlands" also shows considerably lower success rates. Only 48.2% of the sincere votes and 67.6% of the strategic votes with wins (!) were optimal. Overall, only 43.2% of the decisions in this scenario were optimal. In short, successful strategic voting requires transparent decision scenarios.

In a final step, we differentiate the optimal decisions further by distinguishing between the voter profiles in each scenario. By assigning specific voter roles and party preferences, each profile provides a unique opportunity structure for success and failure. Voters assigned to a dominant party are more likely to win high payoffs than voters assigned to a weaker or "loser" party with slim chances to succeed. Table 4 summarizes for each voter profile the share of optimal decisions, the average realized payoffs with standard deviations, and the most frequent party chosen when making strategic decisions.[3] The table suggests that higher payoffs are associated with a higher share of optimal decisions, or in other words, that voters with preferences for "winning" parties are more likely to make optimal decisions. The notable exception to this pattern is the "isolated" voter with a preference for party D in "Sweden." Despite the lowest average payoff, this voter (by sophisticated choice or inadvertently) has the highest rate of optimal decisions.

As expected, the most frequent strategic choice is the second preference. Only the "German" scenario shows a deviation from this otherwise universal pattern. Voters with profile 4 (B-D), and arguably not much to lose, most frequently chose their third preference A when voting strategically. This suggests a clear understanding and implementation of strategic voting. This "voter" deserted the two most preferred parties (and potential coalition partners) in favor of the third preference. This decision is a strategic coalition vote that attempts to move the (disliked) coalition government at least somewhat in a more favorable direction. In addition, voters with profile 5 (C-A) represent the only voter profile or type that, realizing the

[3] Because each scenario has only seven swing voters, not all (eight) possible voter profiles can exist in each scenario. In addition, a specific voter profile can be assigned to more than one participant.

privileged position, never deserted the preferred party. As a consequence, this profile obtained on average the highest payoff in this or all other scenarios. In short, the decisions by the voters with these two profiles suggest a sophisticated understanding of the decision task.

A more systematic test of learning and information effects at the individual level requires a multivariate model that includes not only the election round but also the order in which the scenario appeared in the experimental session, as well as other individual- and group-level variables such as decision times and political knowledge. Initial tests with individual payoffs and optimal decisions as dependent variables do not show significant effects beyond the voter profiles (tables not reported). The only consistently significant variable is the overall group payoff. It is negatively related to individual payoffs and optimal decisions in "Germany" and the "Netherlands," suggesting a zero-sum game in which group and individual goals create a conflict. The group payoff in "Sweden," on the other hand, is positively associated with individual payoffs and optimal decisions, suggesting complementary group and voter interests.

In addition, the correct specification of these decision models is unclear. While repeated decisions and two levels suggest a repeated measures multi-level model, the fact that group- and individual-level variables are reciprocally affect each other raises doubts on the correct specification. For these two reasons, no multivariate models of individual decision making are reported at this point.

Discussion and Conclusion

The main goal of this experimental study of strategic voting in multiparty systems with coalition governments was a test of learning and information effects in repeated elections, using a group experimental design. The study design succeeded in creating decision scenarios of varying degrees of difficulty. Success and failure of voting decisions both at the group and individual level reflect these design characteristics. In terms of the main purpose, however, the study failed to confirm either a learning effect over time or an information effect. The latter failure might be due to the fact that the manipulated information, the random sequence used to break ties during government formation, was not able to provide the expected advantage. The random sequence did not come into play at all or at best was used in every tenth election.

The absence of learning effects is more difficult to explain. A possible explanation is the difficulty of the decision task. Identifying the optimal decision strategy in two of the three

scenarios was fairly easy as long as the other voters behave sincerely. But once several voters start to pursue strategic decisions, identifying optimal decisions becomes very difficult. In addition, if a single group member fails to understand the rules and makes "unexpected" decisions, it will be very difficult for the other group members to optimize their decisions or pursue a sophisticated decision strategy. With only five repeated elections and constantly changing voter profiles, participants might have lacked the opportunity to develop or "learn" reliable and consistent strategies to optimize their vote decisions.

At the same time, the overall results suggest that participants were fairly successful. Over half of the decisions were optimal, that is, the best possible decision, while at most every fifth decision was "wrong." While the number of bad decisions did not increase in the most difficult scenario, it is clearly the case that successful decision strategies with optimal outcomes require transparent election scenarios that allow voters to forecast the outcome of the next election. When given the chance, most voters seize the opportunity.

References

Abramson, Paul R., John H. Aldrich, Phil Paolino, and David W. Rohde. 1992. "'Sophisticated' Voting in the 1988 Presidential Primaries." *American Political Science Review* 86 (1): 55-69.

Alvarez, R. Michael, Frederick J. Boehmke, and Jonathan Nagler. 2006. "Strategic Voting in British Elections." *Electoral Studies* 25 (1): 1-19.

Alvarez, R. Michael, and Jonathan Nagler. 2000. "A New Approach for Modelling Strategic Voting in Multiparty Elections." *British Journal of Political Science* 30 (1): 57-75.

Blais, André, Richard Nadeau, Elisabeth Gidengil, and Neil Nevitte. 2001. "Measuring Strategic Voting in Multiparty Plurality Elections." *Electoral Studies* 20 (3): 343-352.

Cacioppo, John T., and Richard E. Petty. 1982. "The Need for Cognition." *Journal of Personality and Social Psychology* 42 (1): 116-131.

Cox, Gary W. 1997. *Making Votes Count. Strategic Coordination in the World's Electoral Systems*. Cambridge: Cambridge University Press.

Fisher, Stephen D. 2004. "Definition and Measurement of Tactical Voting: The Role of Rational Choice." *British Journal of Political Science* 34 (1): 152-166.

Forsythe, Robert, Roger Myerson, Thomas Rietz, and Robert Weber. 1993. "An Experiment on Coordination in Multi-Candidate Elections: The Importance of Polls and Election Histories." *Social Choice and Welfare* 10: 223-247.

Goodin, Robert E., Werner Güth, and Rupert Sausgruber. 2008. "When to Coalesce: Early Versus Late Coalition Announcement in an Experimental Democracy." *British Journal of Political Science* 38 (1): 181-191.

Gschwend, Thomas. 2007. "Ticket-Splitting and Strategic Voting under Mixed Electoral Rules: Evidence from Germany." *European Journal of Political Research* 46 (1): 1-23.

Herrmann, Michael, and Franz U. Pappi. 2008. "Strategic Voting in German Constituencies." *Electoral Studies* 27 (2): 228-244.

Lanoue, David J., and Shaun Bowler. 1992. "The Sources of Tactical Voting in British Parliamentary Elections, 1983-1987." *Political Behavior* 14 (2): 141-157.

Lewis-Beck, Michael S., and Andrew Skalaban. 1989. "Citizen Forecasting: Can Voters See into the Future?" *British Journal of Political Science* 19 (1): 146-153.

McCuen, Brian, and Rebecca B. Morton. 2002. *Tactical Coalition Voting*. Manuscript.

Meffert, Michael F., and Thomas Gschwend. 2007. *Strategic Voting under Proportional Representation and Coalition Governments: A Simulation and Laboratory Experiment.* SFB 504 Working Paper No. 07-55. University of Mannheim.

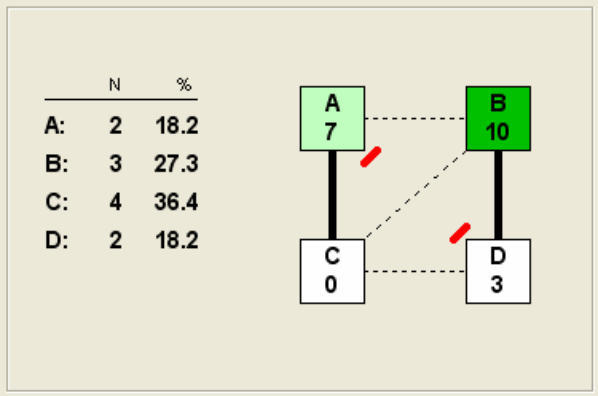
Niemi, Richard G., Guy Whitten, and Mark N. Franklin. 1992. "Constituency Characteristics, Individual Characteristics and Tactical Voting in the 1987 British General Election." *British Journal of Political Science* 22 (2): 229-240.

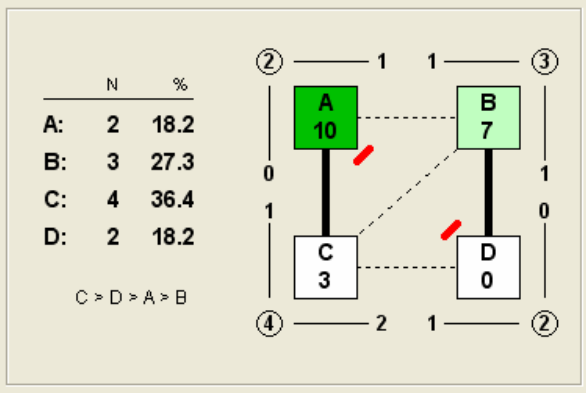
Zaller, John. 1992. *The Nature and Origins of Mass Opinion*. Cambridge: Cambridge University Press.

Figure 1: Election Scenarios

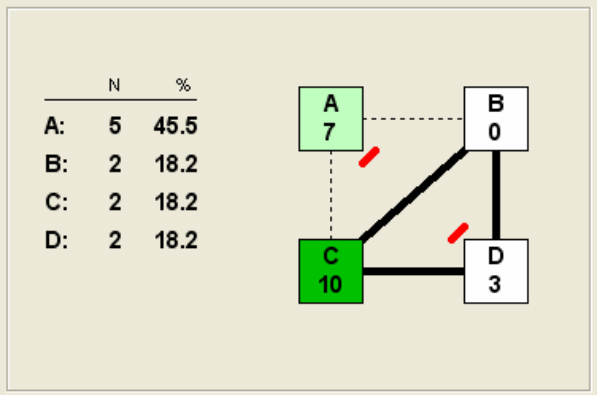
Incomplete Information	Full Information

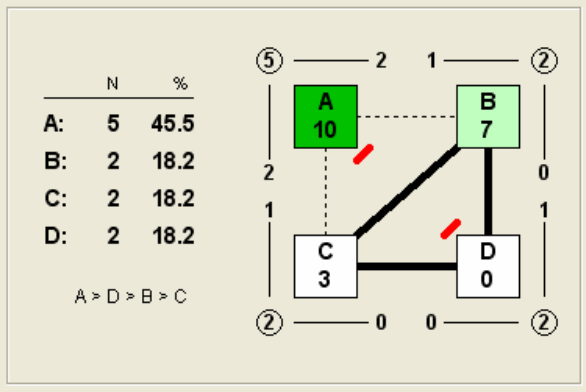
"Germany" – Two Party Blocks



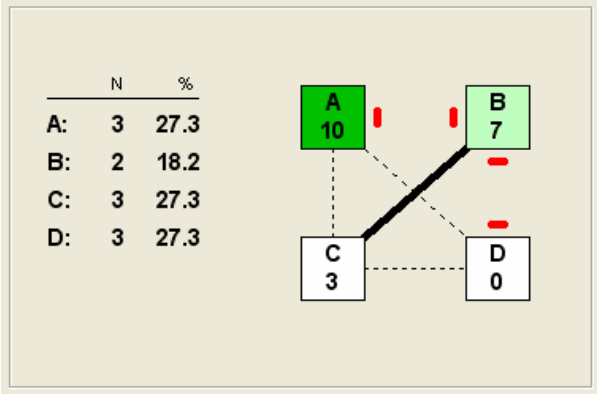


"Sweden" – Dominant Party vs. Small Party Alliance





"Netherlands" – Fragmented Party System



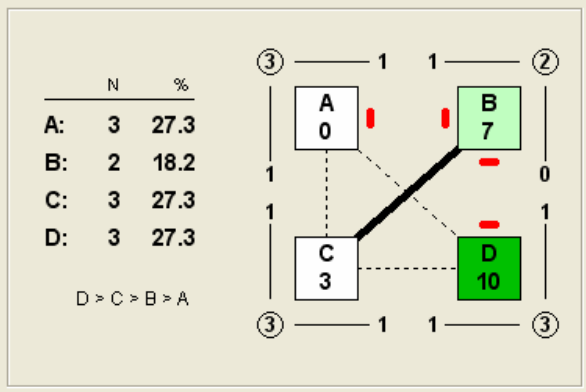


Figure 2: Screenshot of Game Screen (Display of Election Results)

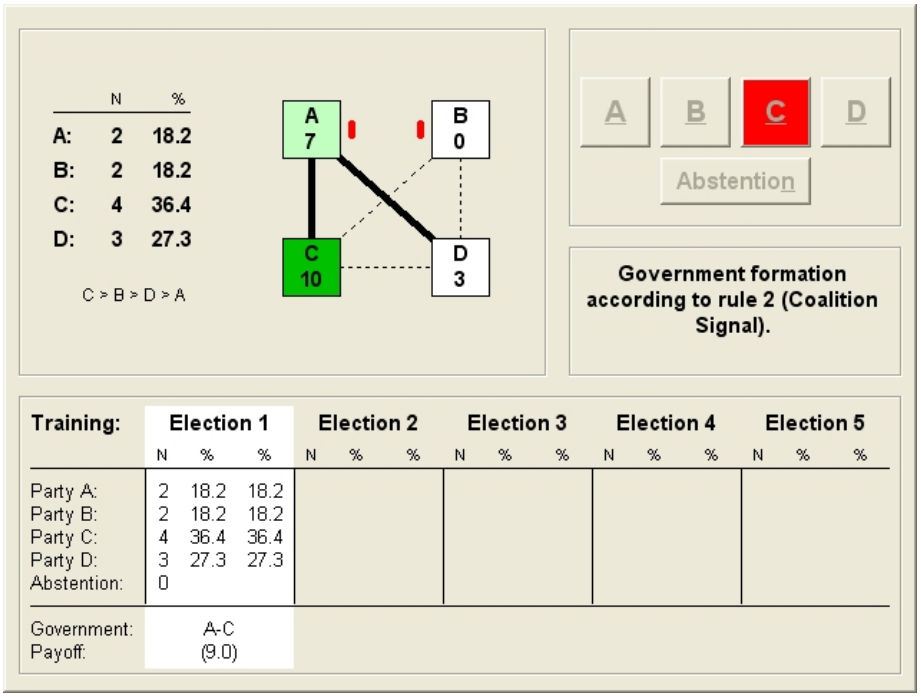
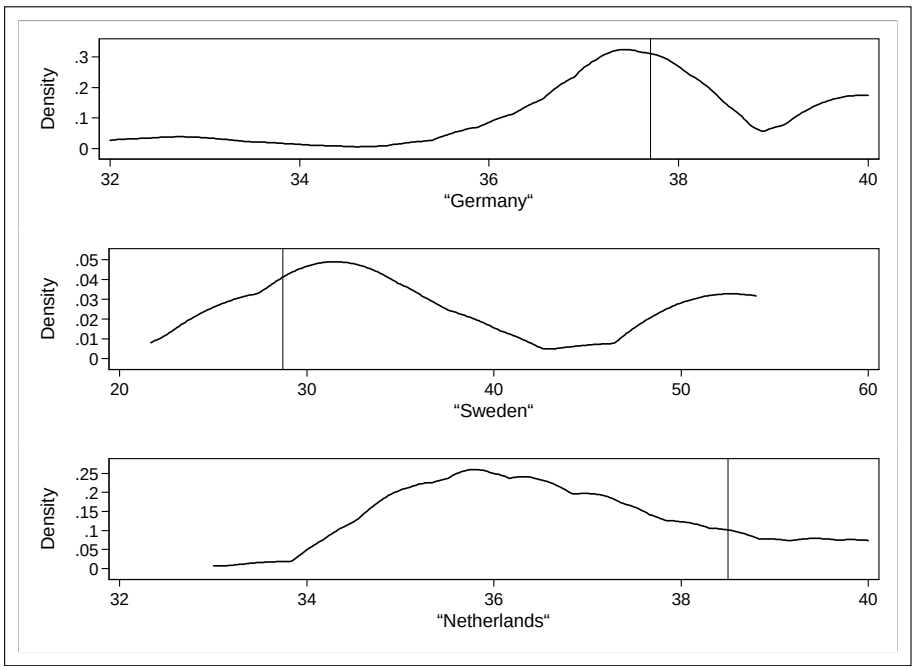
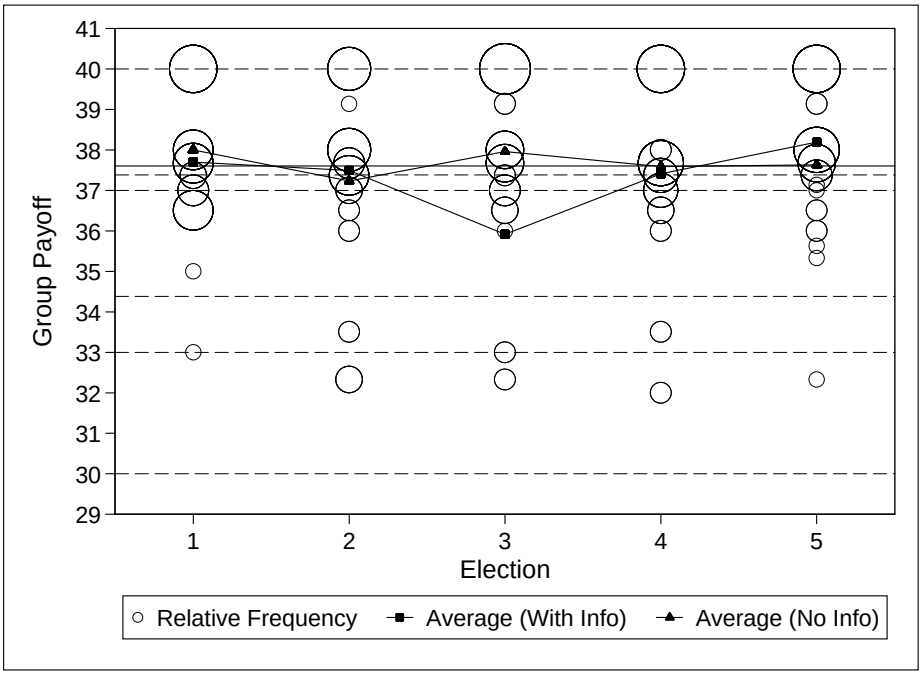


Figure 3: Distribution of Group Payoffs



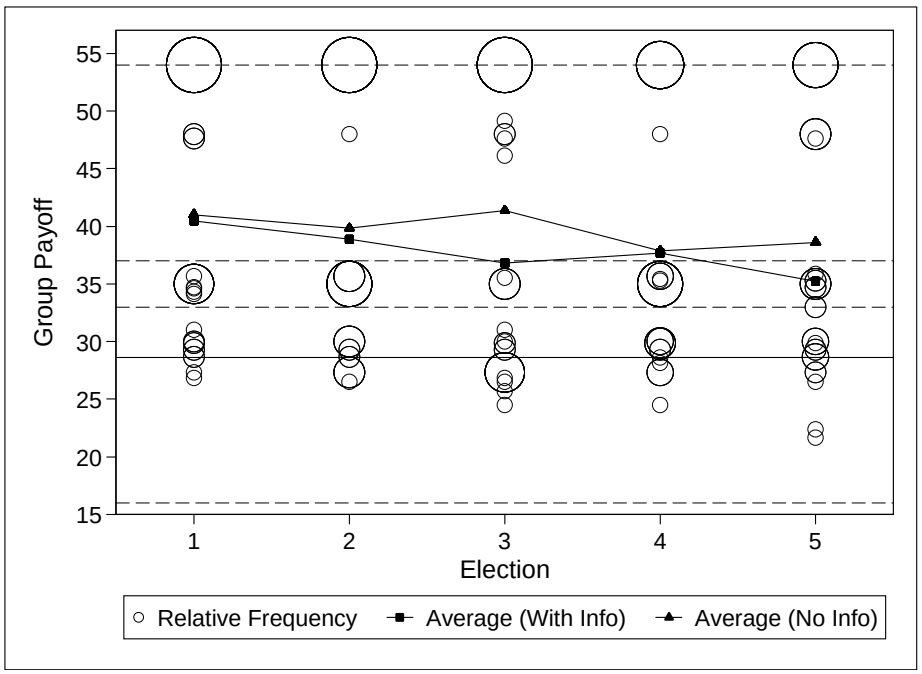
Note: Lines represent density distribution of group payoffs for each scenario, vertical lines represent the default group payoff of a sincere electorate. N=200 (N=185.for "Netherlands").

Figure 4: Group Payoffs „Germany“



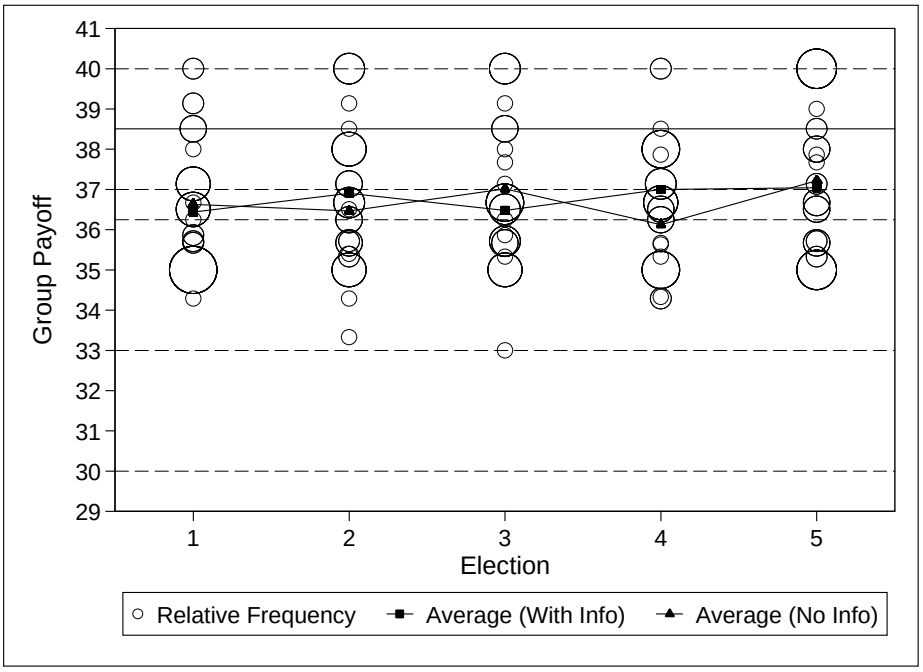
Note: Solid horizontal line represents group payoff of sincere electorate, dashed horizontal lines represent Nash equilibria (including highest and lowest possible group payoff). The size of the circles represents the relative frequency of the respective group payoff. N=40.

Figure 5: Group Payoffs „Sweden“



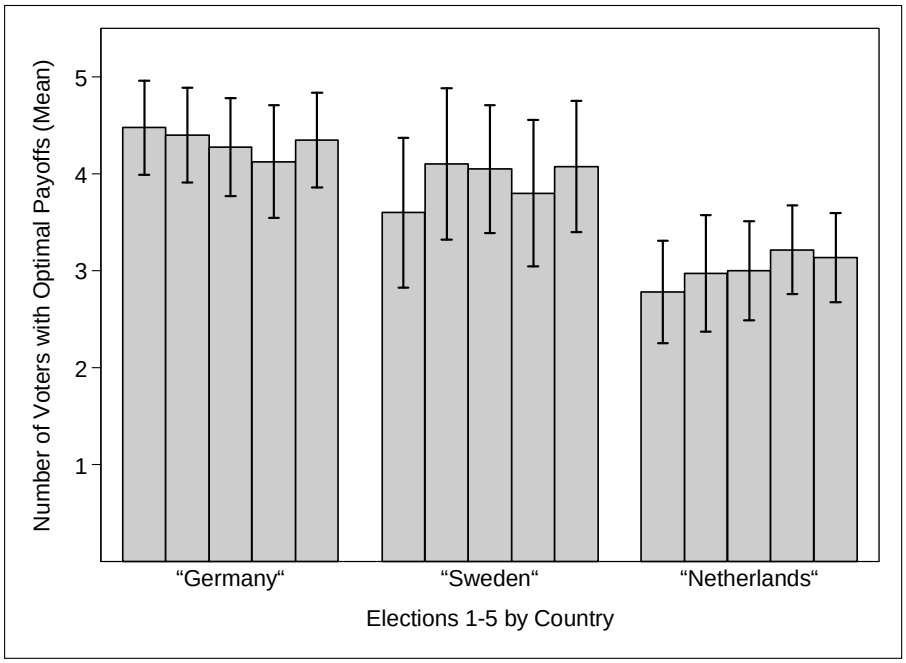
Note: Solid horizontal line represents group payoff of sincere electorate, dashed horizontal lines represent Nash equilibria (including highest and lowest possible group payoff). The size of the circles represents the relative frequency of the respective group payoff. N=40.

Figure 6: Group Payoffs „Netherlands“



Note: Solid horizontal line represents group payoff of sincere electorate, dashed horizontal lines represent Nash equilibria (including highest and lowest possible group payoff). The size of the circles represents the relative frequency of the respective group payoff. N=37.

Figure 7: Number of Optimal Payoffs



Note: Bars represent the average number of voters in a given election round who cast a vote that resulted in the optimal (highest possible) payoff (given the actual vote decisions of the other voters). Spikes represent the 95% confidence interval around the means. Each bar summarizes 40 group decisions (37 for “The Netherlands”) with 7 voters.

Table 1: Last Rule Applied During Government Formation

Last Rule	"Germany"	"Sweden"	"Netherlands"
(1) Absolute Majority	24.5%	30.0%	10.8%
(2) Coalition Signal	72.0%	37.5%	37.8%
(3) Minimal Winning Coalition	3.0%	26.5%	40.0%
(4) Random Sequence	0.0%	5.5%	11.4%
Stalemate	0.5%	0.5%	0.0%
Elections (N)	200	200	185

Table 2: Vote Decision By Preference

Vote Decision	"Germany"	"Sweden"	"Netherlands"	Total
1st Preference	66.9%	56.3%	56.8%	58.4%
2nd Preference	21.7%	37.9%	33.3%	32.1%
3rd Preference	7.9%	2.8%	6.8%	5.8%
4th Preference	3.2%	2.4%	2.9%	3.2%
Abstention	0.3%	0.6%	0.3%	0.5%

Table 3: Success and Failure

Vote Decisions	"Germany"		"Sweden"		"Netherlands"		Gesamt	
	%	Optimal Share	%	Optimal Share	%	Optimal Share	%	Optimal Share
Sincere Vote	66.9	70.1%	56.3	65.9%	56.8	48.2%	58.4	65.1%
Strategic Vote								
with Win	12.3	97.7%	13.6	87.4%	20.2	67.6%	14.6	80.1%
w/out Effect	5.9	48.8%	9.6	73.3%	3.9	54.9%	8.7	68.5%
with Loss	14.9		20.4		19.1		18.3	
N	1400	61.8%	1400	56.1%	1295	43.2%	5495	55.7%

Table 4: Optimal Vote Decisions by Preference Profile

Profile	"Germany"				"Sweden"				"Netherlands"			
	Opt. (%)	Payoff (M)	(SD)	SW (P)	Opt. (%)	Payoff (M)	(SD)	SW (P)	Opt. (%)	Payoff (M)	(SD)	SW (P)
1 (A-B)	60.5	4.8	(1.4)	B	53.5	6.1	(3.0)	B	37.3	4.2	(1.8)	B
2 (A-C)					56.5	6.1	(2.9)	C	34.6	5.6	(1.6)	C
3 (B-A)	41.0	2.3	(1.9)	A	49.5	5.4	(2.1)	A	36.2	3.2	(1.8)	A
4 (B-D)	39.5	1.5	(2.2)	A								
5 (C-A)	78.5	8.5	(2.3)	---	57.5	5.5	(2.1)	A	49.2	6.7	(1.6)	A
6 (C-D)	78.0	7.6	(2.0)	D					56.2	6.8	(1.8)	D
7 (D-B)					65.5	3.8	(2.9)	B	41.6	4.4	(1.6)	B
8 (D-C)	57.0	5.2	(1.4)	C					47.0	5.8	(1.8)	C

Note: Opt. = Percentage (%) of optimal decisions
Payoff = Average realized payoff (M) and standard deviation (SD)
SW = Most frequently chosen party (P) in case of a strategic vote.

Appendix: Game Instructions

[Announced by experimenter:]

Welcome to the experiment “Voting Game.” We investigate decision making in a series of repeated elections. Six participants play together in one group. The study is conducted at the computer and will take approximately one hour. The game will be explained in detail at the beginning. You should read the instructions carefully. The introduction ends with a short test of the rules. Please try to finish the introduction and the test in about 15 to 20 minutes. The training game can only start when all participants have finished the test. Please let me know if you have any questions or encounter any problems with the computer.
Please turn of or mute your mobile phone to avoid any interruptions during the session.
During the game, you will win payoff points that will be converted into Euro at the end. In this session, one payoff point corresponds to 12 Cent. To receive the payoff at the end, you have to complete all games and answer a questionnaire at the end. Then a payoff of 4 Euro is guaranteed.
Are there any questions?
You can start by pressing the function key [F8].

[The following instructions are shown on the computer screen.]

Welcome to the "Voting Game"
Thank you for participating in this study about voting behavior. The study investigates decision making in a series of elections. The “government” formed after each election determines your win. The amount you win depends on your own decisions, the decisions of other participants, and the constantly changing assignment of party preferences. Participation will take about 50 to 60 minutes. Press "Start" when you are ready to begin.

Important Reminder
It is very important that you are not distracted from the tasks in this study. For that reason, please turn off your communication devices (mobile phone, pager, etc.) for the duration of this study. Your cooperation is appreciated.

Procedure of Study
The study has three parts. In the first part, the voting game will be introduced with a detailed explanation of the rules of the game. The introduction ends with a short test of the rules.
In the second part, the actual game takes place. The first game with 5 elections will be for training purposes only and will not affect your final payoff. In the following 3 games, with 5 elections each, your decisions will determine how much you will win.
In the final part, you will be asked to fill out a final questionnaire.

Introduction to Voting Game
Please read the following information very carefully because successful participation requires a very good understanding of the rules.
In this voting game, 4 parties compete for the votes of 11 voters. Each party has a “voter base” of one voter who will always vote for the same party (simulated by the computer). The other seven voters will be played by participants in the study.
Every game consists of an election scenario with a known distribution of the party preference of the voters as well as coalition announcements by the parties. Both do not change over several elections. Each game consists of 5 repeated elections. Before every election, each participant is assigned randomly to play one of the seven voters.

Voting Procedure and Information
Parties that obtain at least 15% of the cast votes will have seats in the new “parliament.” The winner of an election is either a single party or a two- or three-party coalition with an absolute majority of seats (at least 51%).
At the beginning of each election, the following information is always known:

- A “poll” with the distribution of the party preference of all voters;
- Coalition announcements by the parties;
- The rules of government formation.

Rules of Government Formation (1/2)
Four rules determine the formation of government. These rules are crucial for the game and are applied sequentially in the following order:
1) “Absolute Majority:” The party with at least 51% of the seats wins. If no party has an absolute majority on its own, a coalition government with an absolute majority will be formed.
2) “Coalition Announcement:” Positive coalition announcements have priority during government formation, and negative coalition announcements rule out this coalition.

Rules of Government Formation (2/2)
3) “Minimal Winning Coalition:” If two coalitions have an absolute majority but also made the same (positive or neutral) coalition announcement, the following rules apply:
a) A two-party-coalition beats a three-party-coalition.
b) With the same number of parties, the coalition with the lower seat share (of at least 51%) wins.
4) “Random Sequence:” Remaining stalemates between coalitions will be broken by a random sequence that is generated before each election (but which is not always known).
If two parties have 50% of the seats each, government formation is not possible and you will receive no payoff (the next election follows).

Payoff, Time Limit, and Game Screen
Payoff points determine your party preferences. Your most preferred party has 10 points, followed by 7, 3, and 0 points for the other three parties. In case of a single party government, your win will be the corresponding payoff points. In case of a coalition government, your win will be the average payoff points of the member parties, weighted (!) by the number of votes for each party.
The time to make a vote decision is limited to 60 seconds. If you fail to cast a ballot during this time, it will be automatically counted as abstention.
Next, you will be introduced to the game screen. A blue box will provide you with explanations of the various parts of the game screen.

[The following instructions are shown as part of the game screen.]
Voting Game – Introduction
The poll on the left shows you the distribution of the first preferences of all voters for parties A to D (both as count and percentage).
To the right, you see the party matrix with your personal, current payoff points.
Your most preferred party is highlighted in a dark green color, and your second preference is shown in a light green (here C and D).
The most and least preferred party are diagonally opposite for all voters (here B). The second preference of supporters of a party can be different (here A would be possible, too).
The lines and red crossbars between the parties indicate (pairwise) coalition announcements. A thick solid line indicates a positive coalition signal (priority during government formation), a dashed line indicates the absence of a coalition announcement (but a coalition is possible), and two red crossbars instead of a line indicates a negative coalition signal (no coalition possible).
In a game with complete information you will see below the poll a random sequence that is used to break remaining ties during the formation of coalitions. If rules 1 – 3 fail to determine a government, the coalition with the first party in the sequence that is unique to one of the coalitions in the tie wins (rule 4).
When the random sequence is visible, you can also find out the distribution of the second preferences of the voters. If you click on the box of a party, you will see not only the total number of the party supporters (in a circle) but also the second preferences (minus one voter representing the fixed voter base of the party). Clicking a second time on a box hides the information again. Try it out for different parties.
[Example shown:]

2 = Total number of voters with C as first preference, including the constant voter in the "voter base" (identical to poll)
1 = One potential swing voter with first preference C has D as second preference.
0 = No potential swing voter with first preference C has A as second preference.

The voting booth is on the right. When a new game starts, you have initially 60 seconds to orient yourself. Then the election starts and the voting booth will be open for at most 60 seconds and closes once you voted.
Next, vote counting starts. You may have to wait until all voters have cast their votes.
The current status of the game will always be announced in the text box below the voting booth.
After the ballot is completed, the election result will be announced in the table on the bottom of the screen. It shows the number of voters (and non-voters), the vote shares of the parties as a percentage of the cast ballots, and the seat shares of the parties represented in parliament.
In this election, a supporter of B appears to have voted for party A. With only one voter, party B fails to pass the 15% threshold.
Below the result you see the new government (here A-D). The last rule that was used to form the government is listed in the status window above.
The logic of government formation in this case:
Party A fails to obtain an absolute majority (according to rule 1);
According to rule 2 (coalition signal), B-D has a positive signal and priority, but B has no seats in parliament; A-C is ruled out by a negative coalition signal (even if it would be a minimal winning coalition otherwise);
With a neutral signal, A-D is the only possible two-party coalition (C-D fails to obtain an absolute majority).
The government always determines your payoff (even if you abstain or vote for a different party).
Here it is the weighted average of your preferences for A (= 3) and D (= 7), divided by their respective number of votes (5 and 3). Because A is stronger, the payoff must be closer to the value of A. It is exactly 4.5 points, or:

$$\frac{A\ (3 * 5) + D\ (7 * 3)}{\text{Voters}\ (5 + 3)} = 4.5$$

During the game, your current tally of cumulative payoff points is shown in parentheses after the election payoff (during the training game, you will only see the payoff in each election in parentheses).
The result of an election will be shown for 20 seconds. Then the next election starts. All participants switch their voter identities and your new party preferences are shown in the party matrix above. You have 20 seconds to orient yourself before the voting booth opens. After 5 elections, a new game begins.
The introduction is finished. If you have questions or something is not clear, please contact the experimenter now.
Next you will take a short (but hard) test of the rules to optimize you decision making skills.

[Participants answer six multiple choice questions. Each answer is followed by an explanation of the correct answer.]

[Announced by experimenter when all participants have finished the test:]

Are there any questions? Now the training game will start. It consists of one scenario with five repeated elections. The payoff points you win here are not counted toward your payoff at the end.

[Announced by experimenter when participants have finished the training game:]

Are there any questions? Now three games, each with five repeated elections, will follow. The payoff points you win now determine your payoff at the end.

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