Voter Turnout and Selective Abstention in Concurrent Votes

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Abstract: This paper studies voter turnout and selective abstention on voting days with more than one election or referendum. We extend the rational choice model to a setting with multiple concurrent votes. The model is based on a voter's individual net benefit, which includes a vote's salience and information costs. It explains how the net benefit of different concurrent votes enters a voter's utility function and thereby affects turnout and selective abstention, the tendency to vote in one but not all votes held on the same day. We test our theoretical predictions using data on concurrent propositions in Switzerland from 1981 – 2016. Our results suggest that both the proposition with the highest net benefit and the sum of the net benefits of all concurrent propositions are relevant determinants of the individual turnout decision. We also find that a proposition's net benefit explains variation in selective abstention.

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Keywords: Concurrent votes, turnout, rational voter model, selective abstention.

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1 Introduction

Holding multiple elections and referendums on the same day is common practice in most developed democracies. In 68% of OECD countries, voters could vote for more than one election or referendum on the same day in the period from 2010 to 2021. In Colombia, Poland, Spain, and Switzerland, for example, voters elected two different chambers at the national level on the same voting day. Other countries, such as Germany, Italy, Sweden, and the United States, held concurrent elections for parliaments of different tiers. In addition, several countries that held popular referendums combined these with local or national elections, namely Hungary, Lithuania, New Zealand, the United Kingdom, and Switzerland. Despite the ubiquity of concurrent elections and referendums, we do not understand whether and how they affect voters' political participation decisions.

This paper explores individual turnout and selective abstention in concurrent votes (elections and referendums). In the theoretical part, we extend the classical rational choice model to a situation with multiple concurrent votes by introducing fixed and variable components of both costs and benefits (Downs 1957; Riker and Ordeshook 1968). The net fixed component occurs only once per voting day regardless of how many concurrent votes are on the agenda, and the variable part is vote-specific. Subtracting these voting costs from a specific vote's salience gives us the net benefit for each single vote. We then explore how the different net benefits of the concurrent votes enter a voter's utility function and thereby affect turnout. A central assumption of our model is that the utility function of voting is a constant-elasticity-of-substitution aggregation of the net benefits of the single votes. Our model entails two polar cases. In the first case, a voter's total utility depends on the sum of the net benefits of all votes. In the second case, total utility only depends on the net benefit of the vote with the maximum net benefit. For intermediate cases, the model predicts that a marginal rise in the net benefit of the vote with the highest net benefit is the most relevant determinant of individual turnout.

For selective abstention, the theory predicts that voters abstain if the net benefit of a vote is negative.

In the empirical part of our paper, we use survey and administrative data on federal popular votes in Switzerland from 1981 to 2016. This context is an ideal setting to study concurrent votes because Swiss voters regularly decide about binding policy propositions in national referendums and because our survey data includes measures for the benefits and costs of voting. Based on these measures, we compute the individual proposition net benefits for each proposition on a voting day with concurrent propositions and explore their impact on turnout and selective abstention. For turnout, our findings indicate that both the maximum proposition net benefit and the sum of all proposition net benefits matter for the individual turnout decision on voting days with multiple propositions. These findings are consistent with our theoretical model with an intermediate value of our central parameter ρ, which describes the elasticity of substitution among the net benefits of all concurrent propositions. We document that the relative impact of the maximum and the sum of all proposition benefits depends on the number of concurrent propositions per voting day. On voting days with only a few propositions, the sum over all proposition net benefits is the more relevant determinant. On voting days with many propositions, the proposition with the highest net benefit is the more relevant determinant. We also explore how the net benefit of each proposition affects turnout and find that the proposition with the highest net benefit has the largest marginal effect on the turnout decision but lower-ordered propositions still have a significant effect on the decision to turn out.

For selective abstention, we document that propositions with lower net benefits exhibit higher selective abstention rates. In particular, we find that an increase in the net benefit of a proposition by one standard deviation decreases the share of abstainers by 3.3 percentage points. These results allow us to compare the impact of the proposition's net benefit to the impact of the proposition's ballot position, which is an important determinant of selective abstention (Selb 2008; Augenblick and Nicholson 2016). We find that the impact of the ballot position remains statistically significant and economically meaningful but is around three times smaller than the impact of the proposition's net benefit. From a policy perspective, our findings indicate that combining multiple concurrent propositions does not necessarily increase political participation because it increases the share of voters who selectively abstain.

Our paper contributes to the theoretical literature on rational choice models that seek to explain turnout in single elections based on a cost-benefit calculus. The starting point of this branch of theoretical research is Downs (1957). In his model, a citizen votes if her expected benefits, the product of the probability of being decisive times the benefits, exceeds her costs of voting. More recent literature has endogenized the probability of being decisive in game-theoretic models and explains turnout even when voting costs are relatively high (Palfrey and Rosenthal 1983; Ledyard 1984) and in the context of uncertainty (Palfrey and Rosenthal 1985). A second branch of the literature goes back to Riker and Ordeshook (1968) who rationalize the cost-benefit calculus by including civic duty as an additional term in voters' utility function. One caveat of this approach is that civic duty is difficult to observe. As a response to this, Coate and Conlin (2004) and Feddersen and Sandroni (2006) endogenize the concept of civic duty and rely on the behavioral assumption that a citizen's vote decision is driven by maximizing the welfare either of the entire population or of the political group she belongs to. Our contribution to this literature is twofold. First, our paper explains with a rational choice model why individuals vote or abstain in the context of multiple concurrent votes. We analyze how the particular net benefits of concurrent propositions add up to the final individual turnout decision on a given voting day. Second, our theoretical and empirical analysis does not rely on constant benefits and costs at the group level of supporters and opponents but allows benefits and costs to vary at the individual level.

We also contribute to a growing empirical literature on the effects of concurrent votes. For turnout, this literature has shown that holding concurrent votes increases voter turnout (Bracco and Revelli 2018; Cancela and Geys 2016; Cantoni, Gazzè, and Schafer 2021; Dehdari, Meriläinen, and Oskarsson 2021; Garmann 2016; Geys 2006; Kogan, Lavertu, and Peskowitz 2018; Leininger, Rudolph, and Zittlau 2018; Stutzer, Baltensperger, and Meier 2019; Schmid 2016). For selective abstention, Dehdari, Meriläinen, and Oskarsson (2021) have explored the socio-demographic drivers of selective abstention and have documented that people from higher socio-economic backgrounds, immigrants, women, and older individuals are less likely to selectively abstain. This literature has also shown that selective abstention increases for votes further down on the ballot (Bowler, Donovan, and Happ 1992; Bullock and Dunn 1996; Selb 2008; Augenblick and Nicholson 2016). The paper by Augenblick and Nicholson (2016) uses quasi-random variation in ballot position of state propositions in California to document this empirical pattern. While the paper provides credible causal evidence on ballot position effects, it does not analyze the impact of the net benefit on selective abstention. We contribute to this strand of literature by showing that selective abstention depends on both the net benefit of a proposition and its ballot position, but the impact of the net benefit is substantially larger than the impact of the ballot position. We advance this strand of literature by providing a theoretical framework to study concurrent votes.

Closest to our paper is the work of Degan and Merlo (2011) who also study turnout and voting behavior in concurrent votes. They study simultaneous two-candidate elections in an uncertain voting model where citizens are uncertain about candidates' positions and want to avoid voting for the "wrong" candidate. Their model differs from ours in three dimensions. First, we study a classical Downs model, while Degan and Merlo (2011) use an uncertain-voter model combined with a spatial model of voting behavior. Second, their model focuses on two simultaneous two-candidate elections in the context of U.S. Presidential and Congressional elections, while we are primarily interested in direct-democratic popular votes with multiple propositions. Third, their model explains selective abstention as a consequence of uncertainty and we focus on the proposition net benefits to explain selective abstention.

2 A Model of Concurrent Votes

According to Downs (1957), an individual voter i compares the benefits and costs of voting for a single vote

$$U_i = pB_i - C_i, \tag{1}$$

where all variables take positive values, the variable p denotes the perceived probability that a voter is pivotal, B_i is the benefit for voter i when the preferred candidate wins (or the preferred result of the referendum is achieved), and C_i denotes the net costs of voting. Conceivably, elections and referendums with higher salience have a higher benefit B_i. The term C_i consists of two elements, fixed costs of voting F_i and information costs I_i. The fixed costs comprise the costs of going to the poll station or filling out the documents and going to the postbox. On the other hand, fixed costs may be reduced as voting entails civic virtue or expressive benefits (Riker and Ordeshook 1968; Dhillon and Peralta 2002). We assume net fixed costs to be positive. The two elements enter costs C_i in an additive way, $C_i = F_i + I_i$.

Let us discuss two particular features of the utility function in equation (1). First, the utility function should be interpreted as a reduced form of the following decision sequence: The voter has an ex-ante expectation of what the benefit of a vote could be. By incurring the information costs, the voter is able to grasp the benefit more precisely. For ease of notation, the term pB denotes both expected and realized benefits in the utility function. Second, we do not aim to solve the paradox of not voting. This paradox describes that in large elections, the probability of being pivotal and thus the term pB goes to zero. However, there is ample evidence that voters are motivated to vote by a sense of civic duty (Blais 2000; Campbell 2006; Gerber, Green, and Larimer 2008) which is a crucial component in ethical voter models (Feddersen and Sandroni 2006). In the model above, voters who obtain a consumption benefit by fulfilling their civic duty have a negative net fixed cost term C_i and thus a positive turnout even in large elections.

How does this very simple model generalize to multiple elections and referendums? Assume there are N votes, indexed by j, that take place at the same time. Expected benefits pB_{ij} and information costs I_{ij} are vote-specific, whereas net fixed costs F_i occur only once per voting day. Without net fixed costs, the net benefit for a single vote U_{ij} is given as $U_{ij} = pB_{ij} - I_{ij}$.

Obviously, voter i will participate in a single vote j only if $U_{ij} \geq 0$. When will voter i go to the polls to vote for some or all of the different votes? This depends on how the net benefits of the different votes are weighted.

With multiple votes, a voter may be attracted to cast a ballot because of a proposition with a high net benefit or because of the number of all relevant votes that she may decide on. To capture this idea, we assume that the utility function of voting is a constant-elasticity-of-substitution aggregation of the net benefits of the single votes. From this utility value, the net fixed costs of voting F_i are deducted. The utility of voting is

$$U_i = \left(\sum_{j=1}^{N} \left(\hat{U}_{ij} \right)^{\frac{1}{\rho}} \right)^{\rho} - F_i, \tag{2}$$

where $\hat{U}_{ij} = \max \left\{ U_{ij}, 0 \right\}$ and $\rho \in (0, 1]$. Note that the utility function in equation (2) encompasses the Downsian formulation for a single vote (1) as a special case. If we set $N = 1$ and assume $pB_i - I_i > 0$, the index j is no longer needed. We get directly $U_i = U_{ij} - F_i = pB_i - (I_i + F_i) = pB_i - C_i$, which is the formulation in equation (1) above.

Definition 1 (Turnout)**.** *Voter i will go to the polls if* $U_i \geq 0$ *where* U_i *is defined by equation (2). We define turnout* $T_i = 1$ *if* $U_i \geq 0$ *and* $T_i = 0$ *otherwise.*

Definition 2 (Selective Abstention)**.** *If* $U_i \geq 0$*, a vote is cast for a single vote* j *if* $U_{ij} = pB_{ij} - I_{ij} \geq 0$*. For votes where* $U_{ij} < 0$*, the voter will abstain.*

In other words, selective abstention occurs, when the net benefit of a vote j is negative, $U_{ij} < 0$, given the voter goes to the polls. We will make use of this prediction in the empirical section.

What is the role of the parameter ρ in the utility function? To understand this, note that the utility function encompasses several polar cases depending on the value of our central parameter ρ. With $\rho = 1$, the voter's utility function is $U_i = \sum_{j=1}^{K} \max\left\{pB_{ij} - I_{ij}, 0\right\} - F_i$ and the voter considers simply the sum of net benefits of all votes at stake minus the net fixed costs. If ρ goes to zero, U_i approaches $\max_j\left\{pB_{ij} - I_{ij}\right\} - F_i$, the derivation is shown in Online Appendix A. In that case, total utility depends on the maximum net benefit of a single vote U_{ij} only. Hence, if ρ goes to zero voting decisions are driven by the single vote with the highest net benefit.

For intermediate values of ρ, the theory naturally predicts that an increase in the net benefit of vote j is of higher importance for the turnout decision the higher the net benefit of vote j is.

Proposition 1 (Marginal Utility of Vote j)**.** *If* $0 < \rho < 1$*, an increase in the net benefit of vote* j *is of higher importance for the turnout decision the higher the net benefit of vote* j *is.*

Proof. We calculate the partial derivative of the utility function U_i in equation (2) with respect to a single vote $\hat{U}_{ij}$, we get

$$\frac{\partial U_i}{\partial \hat{U}_{ij}} = (U_i + F_i)^{1-\frac{1}{\rho}} \left(\hat{U}_{ij}\right)^{\frac{1}{\rho}-1}. \tag{3}$$

The second derivative of the utility function with respect to $\hat{U}_{ij}$ is positive since $1/\rho > 1$. An increase in the net benefit of a vote with higher net benefit $\hat{U}_{ij}$ has a larger effect on the utility value U_i and thus on turnout than an increase of a vote where the net benefit is lower. □

Proposition 1 predicts that voting behavior is driven more strongly by the important votes, defined as $\hat{U}_{ij}$ large compared to other votes, although the less important ones play a role as well. Formally, an increase in the net benefit of an important vote is more likely to render $T_i = 1$. We will explore this prediction in the empirical section.

3 Institutional Background

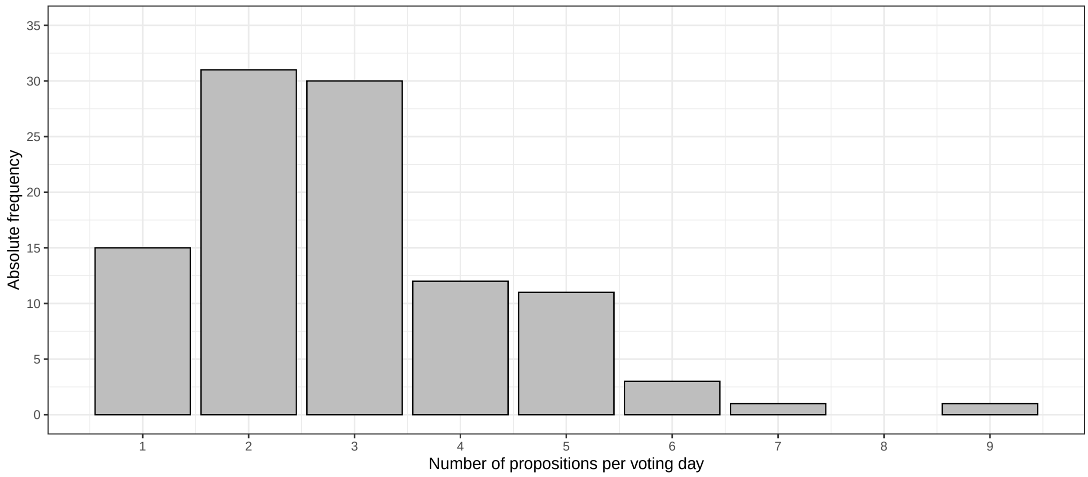
Switzerland is a semi-direct democracy with a bicameral parliament and regular popular votes about policy propositions. The direct-democratic institutions can broadly be distinguished into four instruments. The first instrument is the compulsory referendum which is held for all amendments to the federal constitution and all memberships to international organizations. The second instrument is the optional referendum that challenges acts previously passed by the parliament. It takes place if 50,000 signed petitions have been collected within 100 days. The third instrument is the popular initiative that empowers citizens in Switzerland to propose specific constitutional reforms. It requires the submission of 100,000 signed petitions within a time window of 18 months. The fourth instrument is the counter proposition which is an alternative to a popular initiative designed by the parliament. The counter initiative is held concurrent with the popular initiative.

Overall, Swiss voters decided on 304 federal legislative and constitutional referendums in the period between June 14, 1981, and June 5, 2016.[1] 289 propositions were held concurrent with other

1. We cannot use data after June 5, 2016, because in this period, the information on individual proposition salience for non-voters is not available, as the survey was revised.

propositions on 81 different voting days. Only 15 voting days involved a popular vote with a single proposition. The average number of propositions per voting day is 2.9 with a maximum of nine propositions on 18 May 2003. Figure 1 presents the distribution of the number of propositions per voting day. Most voting days include two or three propositions, and less frequently one, four, or five propositions. Very rarely, it happens that six, seven, or even nine propositions are on the ballot on a voting day.

Figure 1: Distribution of the Number of Propositions per Voting Day

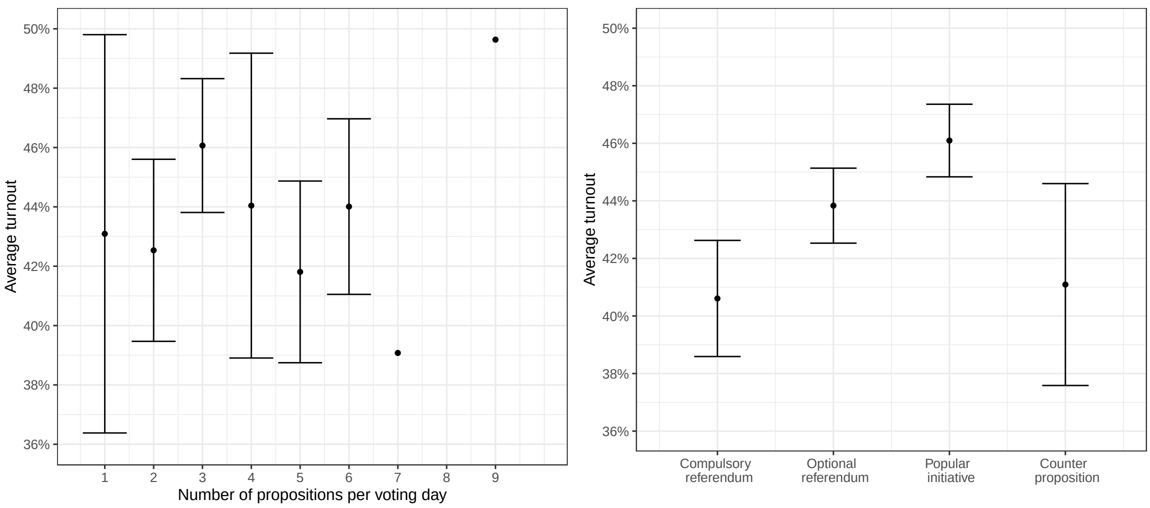


Note: The graph shows the distribution of the number of propositions per voting day, including all popular votes between June 14, 1981, and June 5, 2016.

How are the number of propositions per voting day and the importance of the propositions related? On the one hand, the sample of voting days with single propositions includes important foreign policy decisions for Switzerland, such as the proposed membership to the United Nations (1986 and 2002), the membership to the European Economic Area (1992), the sectoral agreements with the European Union (2000), as well as the extension of the sectoral agreements to the new member states (2005). On the other hand, arguably less important propositions, such as a vote on abolishing animal testing (1985) and one on subsidies for small farmers (1989), were also decided as single propositions.

The heterogeneity in the importance of single propositions is reflected in the turnout rate of these propositions. Both the voting day with the highest and the one with the lowest turnout rate are voting days with single propositions.[2]

Figure 2: Average Turnout by Number and Legal Form of the Propositions



Note: The left graph presents the average turnout by the number of propositions per voting day and the right graph shows the average turnout by the legal form of the proposition. The error bars indicate the 95% confidence interval. The confidence intervals for the average turnout of 7 and 9 propositions per voting day are missing because there is only one voting day for each category.

We find a similar pattern when analyzing administrative data on all propositions in our sample period (Swissvotes 2022). The left panel in Figure 2 presents evidence that there is no obvious relationship between the number of propositions and average administrative turnout. In contrast, the legal form is related to turnout as indicated in the right panel of Figure 2. With a turnout rate of 46.1%, popular initiatives have the highest average turnout, while optional referendums have an average turnout of 43.8%. Counter propositions and compulsory referendums have the lowest average turnout with rates of 41.1% and 40.6%.

The Federal Council decides what propositions are put up for a vote and the ordering of propositions

2. The single proposition with the highest turnout rate was a compulsory referendum about Switzerland's membership in the European Economic Area in 1992 with a turnout of 78.7%. The single proposition with the lowest turnout was an optional referendum on the animal disease act in 2012 with a turnout of 27.6% .

on the ballot. Because these decisions are important for our identification of the ballot position on selective abstention, we have explored their legal basis for the period 1981-2016 which is our sample period. The Federal Chancellery chooses four voting days per year that are reserved for federal referendums.[3] Based on these voting days, the Federal Council decides which propositions will be on the ballot at least four months before the popular vote takes place.[4] In addition to these legally binding restrictions, the Federal Chancellery, the office of the Federal Council, has provided us with a list of common practices. According to this list, the ordering of propositions on the ballot depends on their legal form. Compulsory referendums are on top of the ballot, followed by popular and counter initiatives and constitutional referendums at the bottom. Suppose there is more than one proposition of the same legal form on a voting day. In that case, the day when a referendum meets the legal requirements determines its position on the ballot (in chronological order). We explored how strictly this common practice was implemented. Among all 96 voting days in our sample, 27 voting days had at least one deviation in the ordering of propositions or a deviation in the ordering of propositions within the same legal form. In our robustness section, we probe the sensitivity of our estimates to excluding voting days that deviate from the common practice.

We also explore whether the number of propositions per voting day and administrative turnout exhibit a time trend or whether they are associated with seasonality and electoral cycles. We find no time trend for both variables during our sample period. Similarly, the average number of propositions per voting day and average turnout are unaffected by the season of a vote. We find a somewhat lower turnout in election years (39.8%) compared to non-election years (44.6%).

3. Regulation on Political Rights, Art. 2a 1, Version of June 14, 2002, https://www.fedlex.admin.ch/eli/cc/1978/712_712_712/de, accessed February 3, 2023. The exceptions with only two scheduled voting dates are the years in which federal elections take place.

4. Federal Act on Political Rights, Art. 10 1bis, https://www.fedlex.admin.ch/eli/cc/1978/688_688_688/de; accessed February 3, 2023.

4 Data

We use repeated cross-sectional data on individual turnout and selective abstention from the post-vote survey “VoxIt” to explore how voters are mobilized on a voting day with multiple propositions. It contains 224,776 observations and covers 273 federal propositions on 96 voting days (FORS 2016).[5] The post-vote survey data includes individual information about the political behavior of the participants, such as their turnout decision, the salience of each proposition, and the difficulty a participant had to make up her mind about a proposition.[6] It also includes detailed personal characteristics, such as age, gender, marital status, and education as well as political knowledge.

Table 1: Descriptive Statistics of Turnout, Salience, and Decision Difficulty

Statistic	N	Participants	Mean	St. Dev.	Min	Max
(A) Single propositions						
Turnout	12,268	12,268	0.66	0.47	0	1
Salience	12,268	12,268	5.42	3.01	0	10
Difficulty	12,268	12,268	0.44	0.50	0	1
(B) Multiple propositions						
Turnout	212,508	67,224	0.67	0.47	0	1
Salience	212,508	67,224	5.20	3.12	0	10
Difficulty	212,508	67,224	0.44	0.50	0	1

Note: This table presents the number of observations, the number of participants, the mean value, the standard deviation, and the minimum and maximum value of the variables that we use to construct the empirical cost-benefit calculus. Panel (A) contains voting days with single propositions, and Panel (B) summarizes voting days with two or more concurrent propositions.

In analogy to our theoretical model, we empirically explore an individual’s decision to participate in a popular vote as the difference between the benefits and costs of voting. The costs of voting consist of two elements, net fixed costs of voting and information costs. As a measure of benefits,

5. We exclude eleven voting days with a total of 48 federal propositions. Ten of these voting days have missing data for proposition salience and one voting day has missing data for the residence canton.

6. The survey participants were asked the following question: "In general, do you find it rather difficult or rather easy to imagine the impact of a yes or a no vote on your person, on people like you, with the information you have received?"

we use individual subjective salience. All respondents rated each proposition on a scale from 0 (not important) to 10 (very important). As a measure of information costs, we use the answer to the question of whether a respondent had difficulties making up her mind about a proposition. Table 1 presents the summary statistics of these two variables and the turnout decision from the post-vote survey data. Panel (A) reports the data of all 12,268 individuals on voting days with a single proposition. Panel (B) presents the 67,224 participants who were asked about the propositions on voting days with multiple propositions. In both panels, we observe very similar statistics, the average turnout is about 66% and 67%, the average salience is slightly above 5, and an average of 44% of citizens had difficulties forming an opinion. As expected, Section B.1 in the Online Appendix documents that proposition salience is positively related to turnout, while decision difficulty is negatively related to turnout.

5 Econometric Framework

5.1 Construction of Proposition Net Benefits

Our theoretical model explains the decision to turn out as a cost-benefit calculus. In the empirical part of our paper, we test whether this model is consistent with the data. In order to do so, we first need to bring the measures for the individual benefits and the individual information costs to the same scale and estimate the net fixed costs. Empirically, the probability that voter i participates in proposition j is

$$T_{ij} = \frac{e^{salience_{ij}+\tau * difficulty_{ij}+X_i'\gamma}}{1+e^{salience_{ij}+\tau * difficulty_{ij}+X_i'\gamma}}, \tag{4}$$

where the variable $salience_{ij}$ captures the individual benefit, the variable $difficulty_{ij}$ is a proxy for information costs and X_i is a set of covariates, including age, marital status, gender, university degree, political knowledge, and a constant. The coefficient τ brings the empirical benefits and costs to the same level and the coefficient γ estimates the individual net fixed costs. We use maximum likelihood to obtain estimates for the unobserved parameters τ and γ of this logit model. By focusing on voting days with single propositions, we do not need to estimate the parameter ρ from equation (2), since it is simply equal to one in that case. Assuming that these parameters are constant across different voting days with single and multiple propositions, we use them to construct the proposition net benefits on voting days with multiple propositions. This allows us then to analyze how each proposition's net benefit affects the turnout decision in the context of multiple propositions. Section B.2 in the Online Appendix presents the results for the parameter τ and the parameters included in γ, which we use to construct the net fixed costs.

In our analysis of the individual turnout decision, we only include voting days with multiple (at least two) propositions. We drop single voting days because U^{max} and U^{sum} are the same for these voting days. We then aggregate the proposition net benefits for our two polar cases in equation (2), once with $\rho = 1$ (sum) and once with $\rho \to 0$ (maximum). We do this at the voter × voting day level. This leads to U^{sum}, the total sum over all positive proposition net benefits of casting a ballot on a specific voting day, and U^{max}, the maximum proposition net benefit on a given voting day. Consider a voting day with two propositions. Individual i has a salience of 7 and 10 for these two propositions, the difficulty is equal to 1 for both propositions, and the individual net fixed costs are equal to $\gamma = 3$. Then is $U^{sum} = (7 - 0.9 * 1) + (10 - 0.9 * 1) - 3 = 12.2$ and $U^{max} = 10 - 0.9 * 1 - 3 = 6.1$. The estimated value for $\hat{\tau} = -0.9$ come from Table B.1 in the Online Appendix.

5.2 Descriptive Statistics

Our first outcome variable is individual turnout which we analyze at the voting day level, re-scaled from 0 (abstention) to 100 (turnout). We control for the institutional features of the voting day by including the number of concurrent propositions, which ranges from one to six[7], and the legal form of the votes by including indicator variables for popular initiatives, counter initiatives, and optional and compulsory referendums. We further control for individual characteristics, such as age, gender, university degree, and an indicator for being married as well as a binary measure for political knowledge. Political knowledge is an indicator variable that measures knowledge about the propositions at stake. It is equal to one if a respondent is able to recall the names of all propositions they have voted on. The dependent and independent variables for our main analysis of turnout are summarized in Panel (A) of Table 2. The average voter turnout in our sample of multiple concurrent propositions is 67.2%. There are on average 3.2 propositions per voting day and in 79% of these voting days the citizens can vote on a popular initiative, in 20% on a counter initiative, in 64% on an optional referendum, and in 35.0% of all voting days, they can vote on a compulsory referendum. The average age is 48.4, men and women are equally represented, 17% have a university degree, 61% are married, and 69% have a high political knowledge.

Our second outcome variable is selective abstention that we analyze at the proposition level. For this analysis, we exclude non-voters because they have not participated in any of the propositions at stake. The main outcome variable is selective abstention which measures whether a voter casts an empty ballot for a proposition. Panel (B) of Table 2 documents that voters cast an empty ballot in 4% of all propositions. The main explanatory variables are the net benefit and ballot position of the propositions. A proposition's ballot position is coded according to its appearance on the ballot. This

7. We exclude the voting days with seven and nine concurrent propositions because the survey institute did elicit salience only for a subset of propositions on these voting days.

means that the proposition that is on top of the ballot has a ballot position of one. The average net benefit in our sample is 5.5 and the average ballot position of a proposition is 2.2.

Table 2: Descriptive Statistics

	N	Mean	St. Dev.	Min	Max
(A) Variables measured at voting day level					
Turnout	67,224	67.24	46.93	0	100
U^{sum}	67,224	11.62	10.02	−7.30	58.63
U^{max}	67,224	2.58	3.49	−7.30	9.78
No. of propositions	67,224	3.16	1.08	2	6
Initiative	67,224	0.79	0.41	0	1
Counter initiative	67,224	0.20	0.40	0	1
Optional referendum	67,224	0.64	0.48	0	1
Compulsory referendum	67,224	0.35	0.48	0	1
Age	67,224	48.36	17.19	18	97
Male	67,224	0.51	0.50	0	1
Uni	67,224	0.17	0.38	0	1
Married	67,224	0.61	0.49	0	1
Political knowledge	67,224	0.69	0.36	0	1
(B) Variables measured at proposition level					
Selective abstention	151,578	4.03	19.67	0	100
Net benefit	151,578	5.49	2.97	0	10
Ballot position	151,578	2.20	1.18	1	6

Note: The data with 67,224 observations is aggregated a the voting day level and covers only voting days with at least two concurrent propositions. The data with 151,578 observations is at the proposition level and contains only voters which explains the difference in the number of observations in Panel (B) of Table 1 where non-voters are also included. The columns describe the number of observations, the mean value, the standard deviation, and the minimum and maximum values. U^{sum} is the polar case in equation (2) with $\rho = 1$ and U^{max} is the polar case with $\rho \rightarrow 0$. The variable "net benefit" is a vote's salience minus information costs and fixed costs.

5.3 Estimation model

In this Section, we first describe two different estimation models for our turnout analysis and then turn to the estimation model for our selective abstention analysis.

In our turnout analysis, we theoretically model the aggregation of the single propositions' net benefits using a constant-elasticity-of-substitution utility function. The parameter ρ determines how each single proposition's net benefit affects turnout on a given voting day. In the empirical part, we first focus on the two polar cases with either $\rho = 1$, where voters consider simply the sum of net benefits of all propositions at stake minus net fixed costs and with $\rho \to 0$, where the total utility only depends on the maximum net benefit. To explore whether these two utility measures can explain variation in turnout on a given voting day, we estimate a regression of individual turnout on the sum of all proposition net benefits and the maximum proposition net benefit per voting day. We use repeated cross-section data that includes a sample of eligible voters on different voting days. The main estimation equation is

$$Y_{icdt} = \mu_c + \delta_t + \beta_1 U_i^{sum} + \beta_2 U_i^{max} + X_i^{'}\beta + \varepsilon_{icdt}, \tag{5}$$

where Y_{icdt} denotes the turnout for individual i, living in canton c, for voting day d in year t, U_i^{sum} is the sum over all proposition net benefits for voting day d and U_i^{max} is the maximum net benefit for voting day d, $X_i^{'}$ is a set of control variables, μ_c and δ_t are cantonal and year fixed effects, respectively, and ε_{icdt} is the error term. The set of control variables consists of the number of concurrent propositions, dummies for the legal form of the propositions, and individual characteristics, such as age, gender, marital status, university degree, and a measure of political knowledge. Our coefficients of interest are β_1 and β_2 which measure the impact of the sum over all proposition net benefits and the maximum proposition net benefit, respectively. By including canton fixed effects, we control for unobserved and time-invariant heterogeneity at the cantonal level, which might be related to the individual utility measures. The year fixed effects control for unobserved and canton-invariant factors, such as the overall decline in turnout.

We further explore how the net benefit of each proposition affects turnout by estimating regressions with each proposition's net benefit of a respondent as a separate independent variable. For example, let us assume that there are three propositions at stake on a given voting day and that individual i has a net benefit of 3, 4, and 7 for the respective propositions. In our regression, we include three net benefit variables with an entry of 7 for the highest net benefit, 4 for the second-highest net benefit, and 3 for the third-highest net benefit. The estimation equation is

$$Y_{icdt} = \mu_c + \delta_d + \sum_{p=1}^{P} \beta_p U_i^p + X_i^{'}\beta + \varepsilon_{icdt} \tag{6}$$

where U_i^p is the proposition net benefit for proposition p with $p = 1$ for the proposition with the highest net benefit, $p = 2$ for the proposition with the second highest net benefit, and so on.

In our selective abstention analysis, we explore the impact of a proposition's net benefit and a proposition's ballot position by estimating the following estimation equation:

$$Y_{icpdf} = \mu_c + \delta_d + \gamma_f + \sigma_{df} + \beta_1 U_{ip} + \beta_2 BP_{pd} + X_i^{'}\beta + \varepsilon_{icpdf}, \tag{7}$$

where Y_{icpdf} is an indicator variable indicating whether individual i who lives in canton c casts an empty vote for proposition p of legal form f on voting day d, re-scaled from 0 (filling out the ballot with either yes or no) to 100 (casting an empty vote). U_{ip} is the individual net benefit of proposition p and the variable BP_{pd} measures the ballot position of proposition p on voting day d. In addition to the fixed effects for the cantons μ_c, voting days δ_d, and legal form γ_f, we also include voting day times legal form fixed effects σ_{df}. Therefore, we use the variation within propositions of the same legal form on a given voting day, which allows us to identify the causal effect because the ballot position within propositions with the same legal form is randomly assigned. The fact that we find no statistical association between the ballot position and the individual net benefit for propositions with the same legal form supports this identification assumption (see Figure B.3 in the Online Appendix).

6 Empirical Results

In this section, we use the "VoxIt" survey data on federal popular votes in Switzerland to empirically analyze how each proposition's net benefit affects individual turnout and selective abstention on voting days with multiple concurrent propositions.

6.1 Main Results

6.1.1 Turnout Behavior in Popular Votes with Concurrent Propositions

In the first part of our analysis, we explore the impact of the propositions' net benefit on turnout. Table 3 reports the results of estimating equation (5). Column (1) reports the effect of the sum over all proposition net benefits per voting day, U^{sum}, and the respondent's maximum proposition net benefit per voting day, U^{max}, on turnout, including all voting days with at least two propositions. The estimated effect in Panel (A) is 0.7 percentage points for U^{sum} and 2.5 percentage points for U^{max}. Both coefficients are statistically significant. This indicates that both the sum of all proposition net benefits and the maximum proposition net benefit are important determinants of the individual turnout decision. How do the magnitudes of these two coefficients compare in terms of a one-standard-deviation change? The standardized effects are reported in Panel (B). We estimate an effect of 6.8 percentage points for U^{sum} and an effect of 8.7 percentage points for U^{max}. This indicates that U^{max} is a slightly more relevant determinant of turnout than U^{sum} in terms of magnitude.

Table 3: Effect of Utility on Turnout in Concurrent Propositions

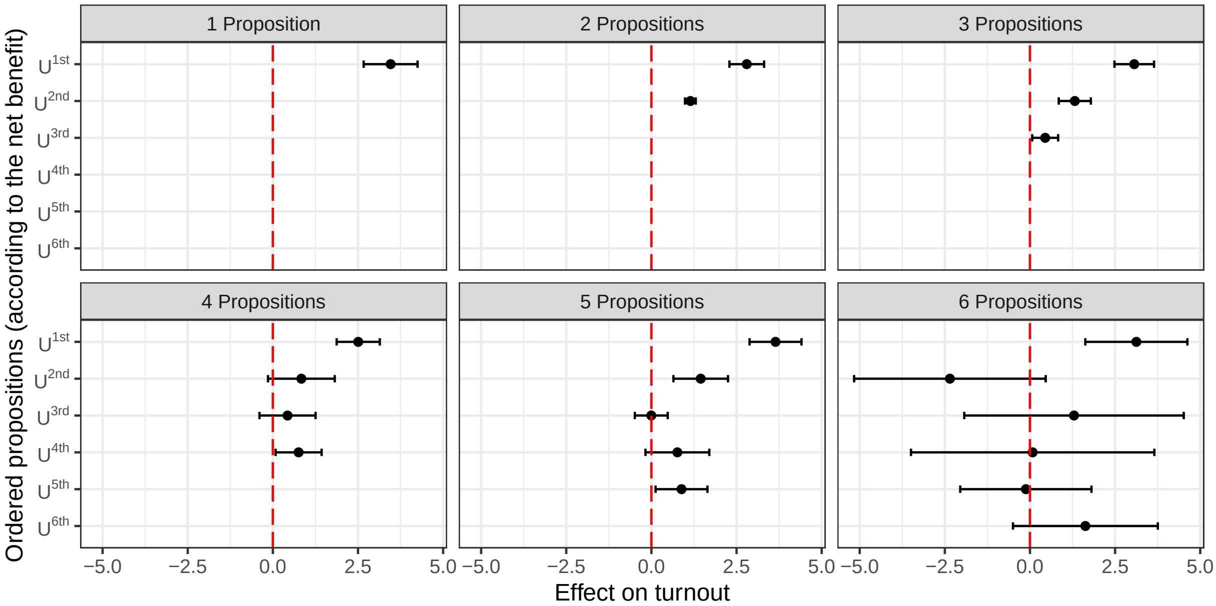
	Dependent variable: Turnout				
	(1)	(2)	(3)	(4)	(5)
(A) Non-standardized variables					
U^{sum}	0.681***	1.124***	0.843***	0.653***	0.590***
	(0.077)	(0.096)	(0.120)	(0.107)	(0.135)
U^{max}	2.491***	1.677***	2.381***	1.900***	2.990***
	(0.211)	(0.330)	(0.335)	(0.407)	(0.397)
(B) Standardized variables					
U^{sum}	6.819***	11.261***	8.441***	6.544***	5.910***
	(0.776)	(0.909)	(1.203)	(0.981)	(1.186)
U^{max}	8.703***	5.858***	8.317***	6.639***	10.444***
	(0.735)	(1.148)	(1.126)	(1.324)	(1.371)
No. of Propositions	>1	2	3	4	5 or 6
Observations	67,224	21,315	25,944	9,249	10,716

Note: In all five columns, the dependent variable is individual self-reported turnout, re-scaled to 0 and 100. All regressions include canton and year fixed effects and include control variables for gender, marital status, age, education, political knowledge, the number of concurrent propositions, and the legal form of the propositions. Panel (A) presents the results of the non-standardized variables and panel (B) presents the results of the standardized variables. Column (1) includes all voting days with two or more concurrent propositions, column (2) includes voting days with two, column (3) voting days with three, column (4) voting days with four, and column (5) voting days with five or six concurrent propositions. The robust standard errors in parentheses are two-way clustered by canton and voting day. *** p<0.01, ** p<0.05, * p<0.1.

In a further step, we split the data into different groups according to the number of concurrent propositions per voting day and present the results in columns (2)-(5). Column (2) reports the effect of U^{sum} and U^{max} for voting days with only two concurrent propositions. The standardized effects indicate that the sum over all proposition net benefits is a more relevant determinant with 11.3 percentage points compared to the maximum propositions net benefit with 5.9 percentage points. The results in columns (3) and (4) indicate that on voting days with three and four concurrent propositions both utility measures U^{sum} and U^{max} exhibit the same effect on the individual turnout decision in terms of a one standard deviation change. The analysis of voting days with five or six concurrent propositions yields a different picture. The results in column (5) indicate that the proposition with the highest net benefit is a more relevant determinant of turnout than the sum of all net benefits. For voting days with five or six concurrent propositions, we find that a one-standard-deviation change in U^{sum} increases turnout by 5.9 percentage points, and a one-standard-deviation change in U^{max} increases turnout by 10.4 percentage points. Both coefficients are statistically significant.

Overall, Table 3 provides two key findings. First, turnout on a voting day with multiple concurrent propositions depends on both the proposition with the highest net benefit and the sum over all proposition net benefits. Second, the relative impact of the two utility measures depends on the number of concurrent propositions per voting day. For voting days with only two concurrent propositions, the individual turnout decision depends on both of the propositions' net benefits rather than just on the net benefit of the proposition with the highest net benefit. For voting days with more propositions, the marginal effect of the proposition with the highest net benefit increases, while the sum of all propositions becomes less important.

Figure 3: Effect of Ordered Net Benefits on Turnout



Note: In all six regressions, the dependent variable is individual self-reported turnout, re-scaled to 0 and 100. All regressions include canton and voting-day fixed effects, and control variables for gender, marital status, age, education, political knowledge, and the legal form of the propositions. The sample consists of individual post-referendum survey data about the federal popular votes in Switzerland for the period 1981-2016. The robust standard errors in parentheses are two-way clustered by canton and voting day in graphs (1)-(5), and in graph (6) they are one-way clustered by canton because the analysis includes only two voting days. The error bars indicate the 95% confidence intervals. The sample includes 14 voting days with one proposition (12,268 observations), 27 voting days with two propositions (21,315 observations), 30 voting days with three propositions (25,944 observations), 12 voting days with four propositions (9,249 observations), 11 voting days with five propositions (9,246 observations), and 2 voting days with six propositions (1,470 observations).

We further explore the theoretical prediction of Proposition 1 on the differential impact of the propositions' net benefits by including all ordered proposition net benefits of a respondent as a separate independent variable as described in equation (6). We repeat this procedure for six different samples: the sample of all voting days with a single proposition, the sample of all voting days with two propositions, and so on. The results are depicted in Figure 3. The top-left figure presents the effect of the individual net benefit for voting days with a single proposition as a benchmark. The point estimate is 3.5 percentage points and statistically significant. The other figures document that the proposition with the highest net benefit is the most important driver of turnout in all samples, while most coefficients for the propositions with lower net benefits are statistically significant but substantially smaller. The pattern is most pronounced for voting days with two and three propositions for which we have good statistical power.

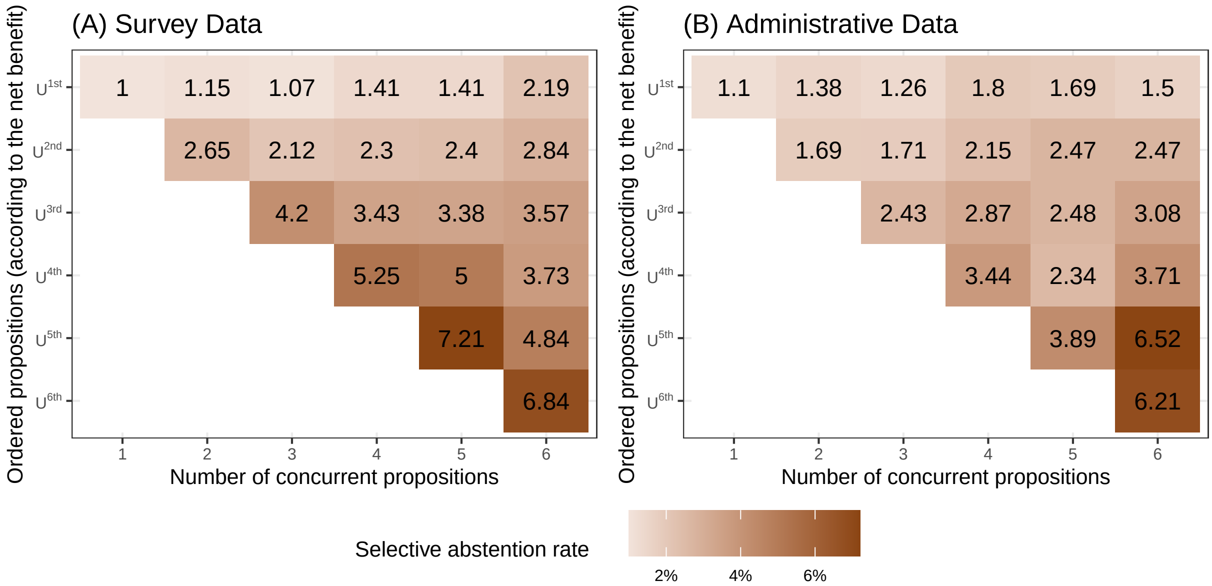
These results are in line with our theoretical model, predicting that voting behavior is driven more strongly by the important votes. The estimates are less precise but qualitatively consistent with our theoretical model for voting days with four, five, and six propositions. The reason for this is twofold. First, the difference between the net benefits of two consecutively ordered propositions declines as the number of concurrent propositions increases, making it more difficult to distinguish them empirically. Second, the statistical power decreases, e.g., there are only two voting days with six concurrent propositions.

6.1.2 Selective Abstention in Popular Votes with Concurrent Propositions

In the second part of our analysis, we empirically analyze how voters selectively abstain on voting days with multiple concurrent propositions. According to our theoretical model, a voter casts a blank ballot for a proposition if the net benefit of that proposition, U_{ij}, is negative. Thus, we expect that the share of selective abstention increases for propositions with lower net benefits on voting days with multiple concurrent propositions.

We empirically analyze this pattern and present the results in Figure 4. Darker areas are associated with higher selective abstention rates. The columns are separated according to the number of propositions per voting day. Panel (A) presents the share of voters in our sample who cast an empty vote per proposition. The propositions are ordered according to the net benefit at the voter level. Let us illustrate this using a voter with a net benefit of 8 for the first proposition and 6 for the second proposition on a voting day with two propositions. In this case, her abstention decision of the proposition with a net benefit of 8 enters the mean of U^{1st} and her abstention decision of the proposition with a net benefit of 6 enters the mean of U^{2nd}.[8]

Figure 4: Share of Selective Abstention by Ordered Net Benefit



Note: Panel (A) presents the share of voters in our sample who abstain from a proposition, which is ordered according to the individual net benefit. The ordering happens within voting days of the same number of concurrent propositions. Panel (B) presents the average share of abstainers among the voters per proposition, using administrative data. The propositions are ordered according to the average net benefit per voting day with the same number of concurrent propositions. For example, U^{1st} includes the propositions with the highest average net benefit of voting days with the same number of concurrent propositions.

Panel (B) presents the average share of abstainers using administrative data. The propositions are ordered according to the average net benefit across all voters based on the survey data. This means that the ordering of the propositions is not individual-specific. For example, we define U^{1st} as the proposition with the highest average net benefit on a given voting day. The patterns in Panel (A) and (B) are similar and provide two major insights. First, the proposition with the highest net benefit always has the lowest selective abstention rate per voting day. Second, the lower a proposition's ranking according to its net benefit, the higher the share of selective abstention. This pattern emerges in all columns except in columns (5) and (6) of Panel (B), where U^{4th} and U^{6th}, respectively, have slightly lower selective abstention rates than expected.

8. If a voter has two propositions with the same net benefit, both propositions are used in each cell to compute the average share of abstainers.

Table 4: Effects of Proposition Net Benefit and Ballot Position on Selective Abstention

	Dependent variable: Selective abstention	
	(1)	(2)
(A) Non-standardized variables		
Net benefit U_{ij}	-1.102^{***}	-1.052^{***}
	(0.095)	(0.088)
Ballot position	0.844^{***}	0.802^{***}
	(0.270)	(0.247)
(B) Standardized variables		
Net benefit U_{ij}	-3.275^{***}	-3.125^{***}
	(0.283)	(0.261)
Ballot position	0.998^{***}	0.948^{***}
	(0.320)	(0.292)
Controls	No	Yes
Canton FE	Yes	Yes
Voting-day FE	Yes	Yes
Legal-form FE	Yes	Yes
Voting-day × legal-form FE	Yes	Yes
Observations	151,578	151,578

Note: The dependent variable for both regressions is self-reported abstention, re-scaled to 0 and 100. In columns (1) and (2), we include canton, legal-form, voting-day, and voting-day × legal-form fixed effects. The regression in column (2) additionally controls for gender, marital status, age, education, political knowledge, and the number of propositions. The reported estimates are standardized to express the impact of a one-standard-deviation change of the explanatory variables on selective abstention. The robust standard errors with two-way clustering by individual and voting day are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

We complement this descriptive analysis with a more elaborate approach by estimating equation (7) and regressing selective abstention on the net benefit U_{ij} and the proposition's ballot position on the official ballot. This allows us to separate the effect of the net benefit from the effect of the ballot position on selective abstention. Table 4 presents the results and offers two important insights. First, our theoretical model predicts that voter i selectively abstains from proposition j if U_{ij} is negative. Thus, we expect a negative association between the net benefit and selective abstention. We test this by regressing an indicator variable capturing selective abstention on the net benefits. The results in Table 4 indicate that this association is indeed negative. The point estimate in column (1) is -1.1 percentage points and statistically significant. It is almost identical when controlling for socio-demographic control variables in column (2). Second, we find that the position of the proposition on the ballot is also an important driver of selective abstention. In both specifications, we find that the share of selective abstention increases by 0.8 percentage points if a proposition is ranked one position lower on the ballot list. This finding indicates that voters in Switzerland who turn out in federal popular votes with multiple concurrent propositions experience choice fatigue.

To compare the effect of the net benefit and the effect of the ballot position, we standardize the two variables and compare their effect on selective abstention. In the specification with control variables in column (2), the effect of the standardized net benefit is -3.1 percentage points and statistically significant. In the same specification, the effect of the standardized ballot position is 1.0 percentage points and highly statistically significant. These findings suggest that the estimated effect of a proposition's net benefit is three times larger compared to the effect of the ballot position. Therefore, choice fatigue is a relevant determinant of selective abstention but less relevant than the net benefits.

6.2 Robustness

We explore the sensitivity of our main findings by conducting several robustness tests. In columns (1)-(3) of Table 5, we focus on the main findings on turnout from Table 3. In columns (4)-(6), we test the main findings on selective abstention from Table 4.[9]

9. We also test whether our findings for the ordered net benefits are robust to using administrative turnout data, using binary utility measures, and estimating a logistic regression model. In addition, we explore the accuracy of turnout predictions for different values of ρ. These additional robustness tests are reported in Section B.3 of the Online Appendix.

Administrative Data — Since our main results in Section 6.1 rely on self-stated outcome variables, social desirability might bias our results. For this purpose, we test whether our main findings are robust with administrative outcome variables. Column (1) of Table 5 presents the effects of U^{sum} and U^{max} on administrative turnout when we aggregate all variables to the canton × voting day level. This substantially reduces our sample size to 1,841 observations and prevents us from using individual-level heterogeneity in the net benefits. The coefficients for U^{sum} and U^{max} are both statistically insignificant with 0.1 and 0.7 percentage points, respectively, but the coefficient for U^{max} is at the margin of statistical significance with a p-value of 0.121. Despite the lack of statistical power when using aggregate administrative turnout data, these results support the main findings that U^{max} is a slightly more relevant determinant of the turnout decision than U^{sum}. Social desirability might also bias our findings on selective abstention and therefore we estimate a regression using administrative abstention data on the average proposition net benefit and the ballot position. The results in Column (4) of Table 3 support the findings in Table 4 that both the net benefit and the ballot position are relevant determinants of selective abstention.

Functional Form — In our main analysis, turnout and selective abstention are binary outcome variables. To estimate the effect of U^{sum} and U^{max} on turnout and the effect of the proposition net benefit and the ballot position on selective abstention, we use linear probability models. To probe the robustness of our results with respect to the functional form, we test whether our results are robust when we estimate a logistic regression. The results in columns (2) and (5) provide evidence that our main findings on turnout and selective abstention are robust to an alternative functional form of the regression equation.

Table 5: Robustness Tests

	Dependent variable:					
	Turnout			Selective abstention		
	(1)	(2)	(3)	(4)	(5)	(6)
U^{sum}	0.063	0.730***				
	(0.166)	(0.050)				
U^{max}	0.707	1.959***				
	(0.456)	(0.124)				
$1\{U^{sum}>0\}$			11.398***			
			(1.173)			
$1\{U^{max}>0\}$			20.638***			
			(1.592)			
Net benefit				-0.315***	-1.049***	-1.050***
				(0.072)	(0.025)	(0.099)
Ballot position				0.170*	0.622***	1.072***
				(0.088)	(0.055)	(0.361)
Administrative data	Yes	No	No	Yes	No	No
Survey data	No	Yes	Yes	No	Yes	Yes
Linear model	Yes	No	Yes	Yes	No	Yes
Logit model	No	Yes	No	No	Yes	No
Observations	1,841	67,224	67,224	6,185	151,578	119,496

Note: The dependent variable in column (1) is average administrative turnout per voting day and canton, and the explanatory variables U^{sum} and U^{max} are also aggregated at the voting day and cantonal level. Column (2) presents the marginal effects of a logistic regression where the dependent variable is self-stated turnout (0 or 1) and the marginal effects are retransformed to a scale from 0 to 100. Column (3) presents the effect of the binary utility measures where the dependent variable is turnout, re-scaled from 0 to 100. The dependent variable in column (4) is the average administrative measure for selective abstention per proposition and canton and the explanatory variables consist of the average net benefit per proposition and canton and the ballot position. The dependent variable in column (5) is an individual self-stated indicator variable, indicating whether a voter casts an empty vote, re-scaled from 0 to 100. The presented effects are the marginal effects of the logistic regression. The regression in column (6) excludes the voting days, where the propositions of the same legal are not chronologically ordered on the ballot. In columns (2), (3), (5), and (6) we control for socio-economic characters on the individual level, and in columns (1) and (4) we include the average of these socio-economic characters from our sample on cantonal and voting day level. The robust standard errors with two-way clustering by canton and voting day (in columns (1), (3), (4), and (6)) and with one-way clustering by voting day (in columns (2) and (5)) are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Binary Utility Measure — Our theoretical model in Section 2 predicts that an individual will go to the polls if the utility of voting is strictly positive. Our main results support the theoretical model, although the empirical analysis relies on continuous utility measures. As a robustness test, we create binary utility measures for the sum over all proposition net benefits, $1\{U^{sum} > 0\}$ and for the maximum proposition net benefit of a voting day, $1\{U^{max} > 0\}$. We present the effect of these binary utility measures on turnout in column (3), where we find results that support our main findings in Table 3.

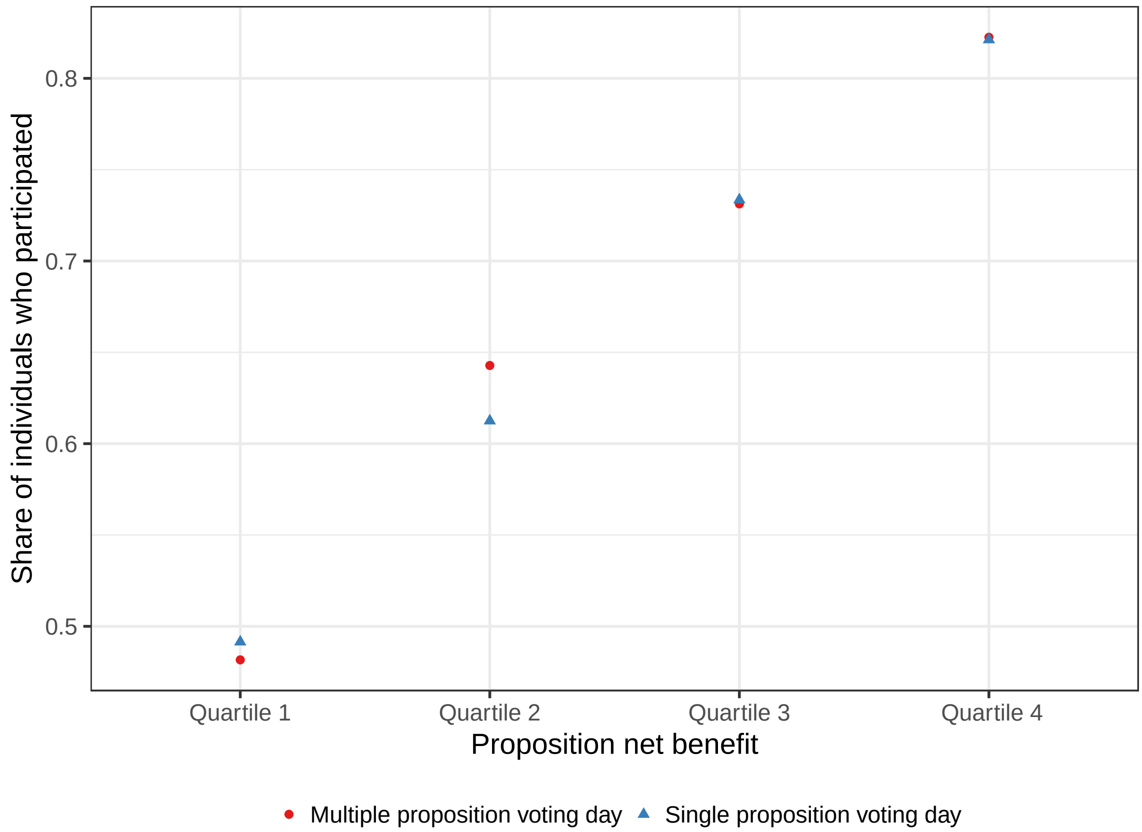
Identifying Assumption in Selective Abstention Regression — The interpretation of the findings on the impact of the ballot position on selective abstention in Table 4 crucially depends on the institutional details of how propositions are arranged on the ballot. As discussed in Section 3, it is a common practice of the Federal Chancellery first to consider a proposition's legal form and then the day when it meets the legal requirements. In our sample of 96 voting days, the propositions with the same legal form are not chronologically ordered on 17 voting days. We drop these voting days as a robustness test and present the results in column (6) of Table 5. The point estimate for the net benefit remains almost identical. This suggests our results are not sensitive to excluding voting days where the Federal Chancellery deviates from its common practice.

6.3 Discussion: Assessing the Turnout and Selective Abstention Effect

The first set of our results provides evidence that turnout increases with the net benefit of concurrent propositions. The second set of our results documents that bundling multiple propositions leads to higher selective abstention rates, particularly for propositions with a lower net benefit. If a policymaker wants to increase political participation, i.e. the number of individuals who cast a yes or no vote, there seems to be a major trade-off between the turnout and the selective abstention effect. Because concurrent propositions with a high net benefit increase turnout rates, the ideal system would be one that combines propositions with a high net benefit with propositions with a low net benefit. This system, however, would have the drawback that selective abstention rates are very high.

To assess the importance of the turnout effect relative to the selective abstention effect, we create a new variable that is equal to 1 if a voter casts a ballot yes or no vote. This implies that all voters who either do not turn out on a voting day or selectively abstain in a proposition are coded as 0. We call this new variable "political participation". If the turnout effect dominates, we would expect higher rates of political participation in multiple proposition voting days compared to single proposition voting days even if there is selective abstention. If the selective abstention effect is more relevant, we would see higher participation rates for single-proposition voting days.

Figure 5: Voting in Single and Multiple Propositions



Note: This figure presents the share of individuals who voted (y-axis) for a proposition with a given net benefit (x-axis). Voted is 1 if a voter has turned out and not selectively abstained in the respective proposition. The red dots indicate voting days with multiple propositions, and the blue triangles voting days with a single proposition. The data include all 224,776 VoxIt observations.

Figure 5 shows the share of individuals who participated in single (red dots) and multiple (blue triangles) proposition days (y-axis). We depict this share by the individual-level net benefit of a proposition (x-axis). The figure documents that for propositions with a net benefit in the second quartile, participation rates are higher for multiple proposition voting days. However, for all other net benefit categories, the pattern is not obvious, and often the participation differences are close to zero. These results do not give a clear policy recommendation.

7 Conclusion

Holding concurrent votes is common practice in Western democracies. In this paper, we develop a rational choice model and empirically test its implications using federal popular votes with multiple propositions in Switzerland. Our theoretical model captures the turnout decision on voting days with multiple propositions as a cost-benefit calculus. The voting costs comprise a variable and a fixed component where the variable information costs must be paid separately for each proposition and the fixed cost component is voting day-specific. The distinction between the variable and the fixed part is the reason why the calculus of voting for voting days with multiple concurrent propositions differs from the calculus of voting for voting days with a single proposition. Our model relies on the assumption that the utility function of voting is a constant-elasticity-of-substitution aggregation of the net benefits of the single propositions. The two polar cases of this aggregation define the total utility of an individual as (i) the sum of net benefits of all propositions per voting day and (ii) the maximum net benefit among all single propositions on a voting day. The derivative of the utility function implies that for intermediate values of the elasticity of substitution, the proposition with the highest net benefit is the most relevant determinant of individual turnout.

In the empirical part of the paper, we test the implications of the theoretical model with data on federal popular votes in Switzerland from 1981 to 2016. In our turnout analysis, we find that both the maximum and sum of all proposition net benefits affect individual turnout in concurrent votes whereby their relative impact depends on the number of concurrent propositions on the ballot. On voting days with few concurrent propositions, the sum over all proposition net benefits is a more relevant determinant. On voting days with many concurrent propositions, the maximum among all net benefits is the more relevant determinant. We also find evidence that the highest proposition net benefit has the largest marginal effect on turnout and that the effect size decreases with lower-ranked proposition net benefits. In our analysis of selective abstention, we find that the propositions' net benefit is an important driver of whether individuals selectively abstain. A comparison between the impact of a proposition's net benefit and the impact of a proposition's ballot position suggests that both are important determinants of selective abstention but that the impact of the net benefit is substantially larger. We also discuss the implications of our results for the organization of multiple propositions.

We stress one important limitation of our approach. In our theoretical and empirical analysis, we hold important parameters, such as the probability of being decisive, constant across individuals and propositions. Our approach thus does not consider the potential heterogeneity among different demographic groups. One fruitful area for further research would be exploring how heterogeneous parameters alter the calculus of voting.

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Online Appendix

Voter Turnout and Selective Abstention in Concurrent Votes

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A Theoretical Derivations

Derivation of Utility Function for $\rho \to 0$

Let us denote the maximum value of U_{ij} by $\max_j U_{ij} =: U_{ij}^{\max}$. All $n \geq 1$ propositions that take the maximum value are denoted by the index $j^{\max}$ where $\arg\max_j U_{ij} =: j^{\max}$.

$$\begin{aligned}
\lim_{\rho\to 0} U_i &= \lim_{\rho\to 0} \left(\sum_{j=1}^{N} U_{ij}^{1/\rho} \right)^{\rho} - F_i \\
&= \lim_{\rho\to 0} \exp\left(\frac{\ln\left[\sum_{j=1}^{N} U_{ij}^{1/\rho}\right]}{1/\rho} \right) - F_i.
\end{aligned}$$

We substitute $\rho = 1/\nu$, when ρ approaches 0, ν goes to infinity. We apply Bernoulli-d'Hôpital's rule and divide both sides of the ratio with $U_{ij}^{\max}$. This yields

$$\begin{aligned}
\lim_{\rho\to 0} U_i &= \lim_{\nu\to\infty} \exp\left(\frac{\left[\sum_{j=1}^{N} U_{ij}^{\nu}\right]^{-1} \sum_{j=1}^{N} U_{ij}^{\nu} \ln U_{ij}}{1} \right) - F_i \\
&= \lim_{\nu\to\infty} \exp\left(\frac{\sum_{j=1}^{N} U_{ij}^{\nu} \ln U_{ij}}{\sum_{j=1}^{N} U_{ij}^{\nu}} \right) - F_i \\
&= \lim_{\nu\to\infty} \exp\left(\frac{n \ln U_{ij}^{\max} + \sum_{j=1, j\neq j^{\max}}^{N} \left(U_{ij}/U_{ij}^{\max}\right)^{\nu} \ln U_{ij}}{n + \sum_{j=1, j\neq j^{\max}}^{N} \left(U_{ij}/U_{ij}^{\max}\right)^{\nu}} \right) - F_i.
\end{aligned}$$

Evaluating the limes of the latter expression yields the desired result

$$\lim_{\rho\to\infty} U_i = \exp\left(\ln U_{ij}^{\max}\right) - F_i = U_{ij}^{\max} - F_i.$$

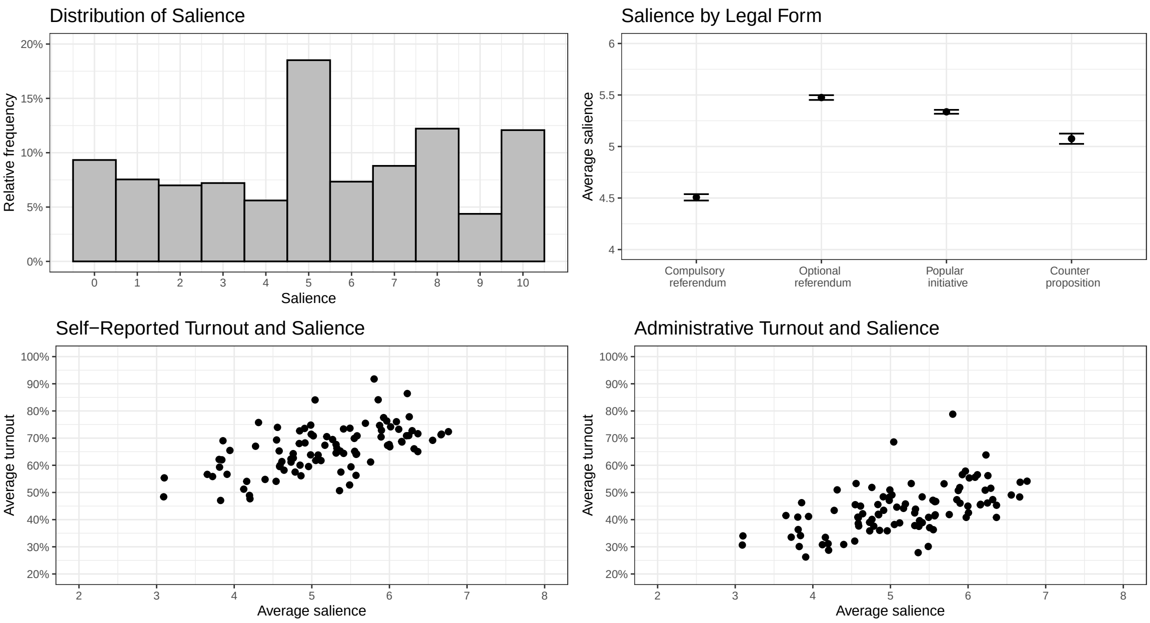
B Additional Tables and Figures

B.1 Additional Descriptive Statistics

The Relationship between Salience, Information Costs, and Turnout — Figure B.1 presents descriptive statistics on the individual subjective salience and sheds light on how this variable is related to both the legal form of a proposition and turnout. The upper left panel shows the distribution of the measured salience for voters and non-voters. Citizens often choose prominent numbers in the middle and at the tails of the distribution (0, 5, or 10). The mode with a value of 5 is clearly higher than the other values. The upper right panel in Figure B.1 presents the average individual salience for each of the four legal forms of a proposition. Optional referendums and popular initiatives score highest in terms of average salience, followed by counter propositions. Compulsory referendums score lowest in terms of average salience. This relationship between the legal form and salience is qualitatively similar to the relationship between the legal form and administrative turnout in Figure 2, lending support to our salience measure. The individual salience not only depends on the legal form of the proposition but is also associated with turnout. The lower two panels in Figure B.1 demonstrate how the average salience per voting day from the post-vote survey is correlated with self-reported (lower left graph) and administrative turnout (lower right graph). In both graphs, we observe a strong positive statistical correlation of 0.58 and 0.55, respectively.

This comparison of average salience ignores that the concurrent propositions on the same voting day may differ in terms of salience. However, there is a high congruence about which proposition is the most important per voting day among survey participants. The average congruence about the top proposition is 84.5% when there are two concurrent propositions. This means that 84.5% of respondents rate the same proposition as more important on voting days with two propositions. The congruence decreases to 73.5% for voting days with three propositions and 71.6% for voting days with four propositions. The congruence is still 69.4% for voting days with five concurrent propositions.

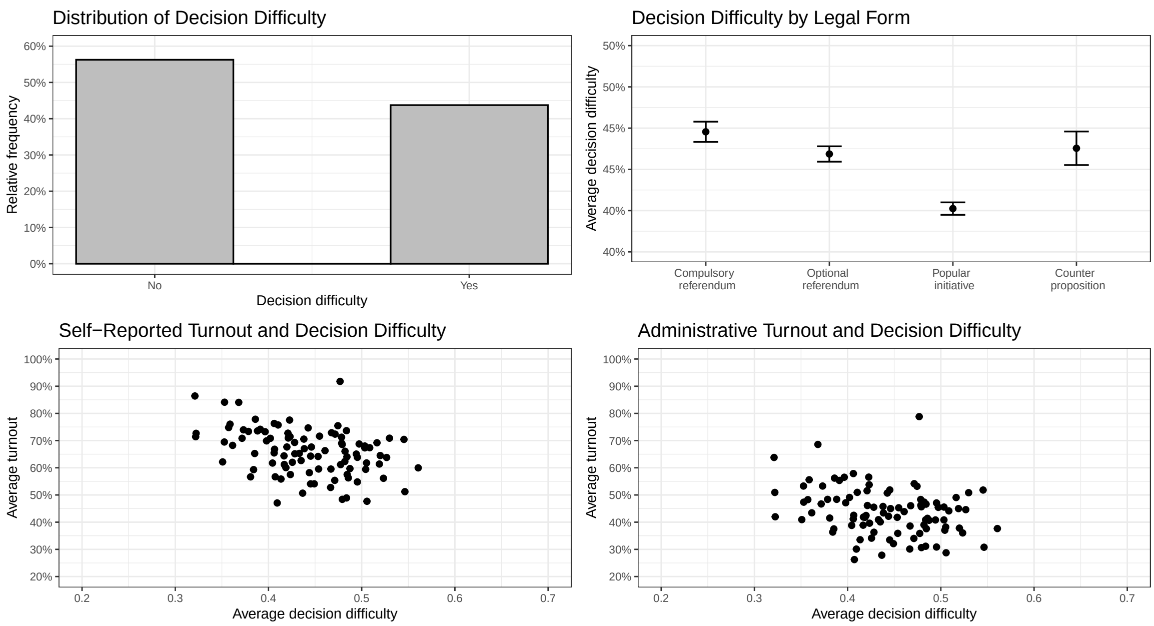
Figure B.1: Individual Subjective Salience



Note: The upper left panel presents the distribution of the individual subjective salience, which ranges from 0 (not important) to 10 (very important). The upper right panel shows the average salience by the legal form of the proposition, where the error bars illustrate the 95% confidence interval of the mean. The lower left panel presents the relationship between the average individual self-reported salience and the average individual turnout per voting day, and the lower right panel presents the relationship between the average individual salience per voting day from survey data and the average turnout from administrative data.

The second part of the cost-benefit calculus in our theoretical model consists of the voting costs. Since we do not directly observe individual voting costs, we use the answer to the survey question on the difficulty of the vote choice as a proxy for voting costs. Figure B.2 presents descriptive statistics about our empirical measure of voting costs. The upper left panel shows the distribution of the vote choice difficulty for voters and non-voters. Over 55% of our respondents stated not to have had difficulties in their vote choice. The upper right panel presents the average difficulty for each of the four legal forms of a proposition. There is no statistically significant difference among the average difficulty of compulsory referendums, optional referendums, and counter propositions, but the figure suggests that individuals have fewer difficulties forming their opinion about popular initiatives. A possible explanation for this pattern is the fact that political actors advertise popular initiatives more aggressively than the other legal forms and therefore, citizens have fewer difficulties to decide. As expected, the two lower graphs show that self-reported average turnout (lower left graph) and administrative turnout (lower right graph) are both negatively related to the average difficulty of the citizens per voting day with a correlation coefficient of -0.39 and -0.28, respectively.

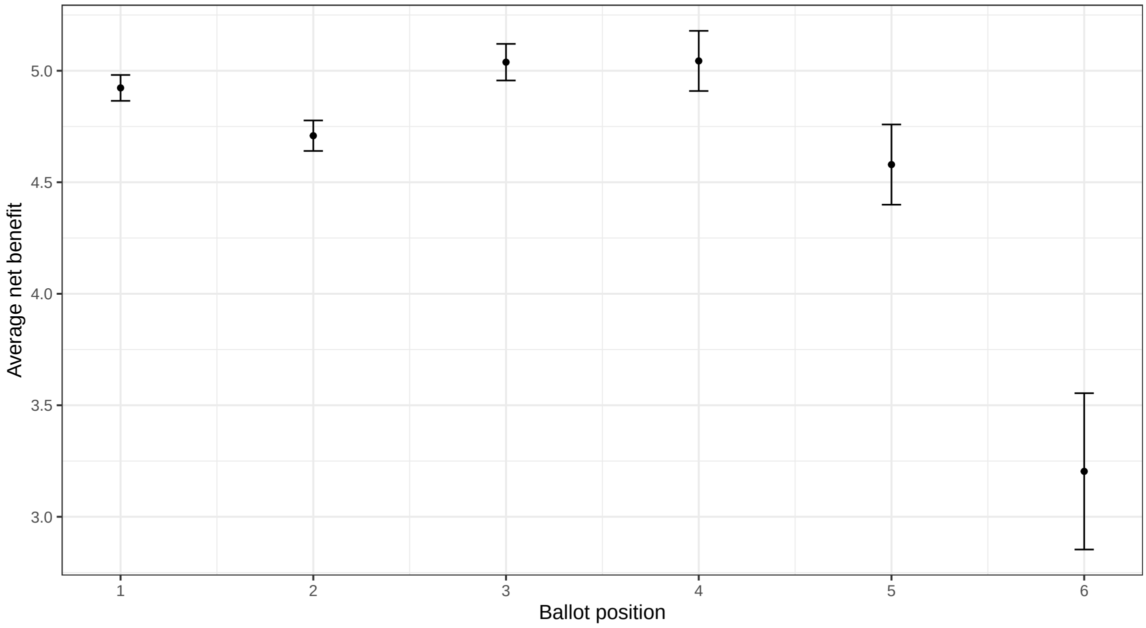
Figure B.2: Individual Vote Choice Difficulty



Note: The upper left panel presents the distribution of the vote choice difficulty for a proposition. The upper right panel presents the average difficulty by the legal form of the proposition, where the error bars illustrate the 95% confidence interval of the mean. The lower left panel presents the relationship between the average difficulty and the average self-reported turnout, and the lower right panel presents the relationship between the average self-reported average difficulty from the survey data and the average turnout from administrative data.

Net Benefit and Ballot Position — Figure B.3 presents the average net benefit of all propositions with the same position on the ballot. The findings indicate that there is no clear pattern between the net benefit and the position of the proposition on the ballot.

Figure B.3: Average Net Benefit by Ballot Position



Note: The graph shows the average net benefit by the ballot position of the propositions. The error bars indicate the 95% confidence interval.

B.2 Estimation of Utility Parameters

We use the voting days with single propositions to estimate the coefficients τ and γ of equation (4) and present the results in Table B.1. The maximum likelihood estimation results in $\tau = -0.9$ and the net fixed costs for a 50-year-old male voter, who is married, has a university degree, and has a high political knowledge is -2.2. We use age and the indicator variables male, married, university, and political knowledge to construct the individual net fixed costs. The net fixed costs vary in the sample between -7.3 and -0.2, indicating that the fixed costs exceed the consumption benefit induced by civic duty for all individuals and the sample average is -3.7.

Table B.1: Maximum Likelihood Estimation of τ and γ

	Dependent variable: Turnout
τ	-0.906^{***}
	(0.064)
Male	0.031
	(0.064)
Married	0.713^{***}
	(0.065)
Age	0.049^{***}
	(0.002)
University	0.566^{***}
	(0.084)
Political knowledge	2.238^{***}
	(0.084)
Constant	-8.180^{***}
	(0.133)
Observations	12,268

Note: The dependent variable is individual self-reported turnout (0/1). The table reports the results of a maximum likelihood estimation of equation (3) using the voting days with single propositions. The standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

B.3 Additional Robustness Tests

Ordered Net Benefits and Administrative Turnout — Table B.2 presents the effect of the ordered net benefits on administrative turnout. The outcome variable is the average turnout at the cantonal and voting day level for voting days with the same number of concurrent propositions. The ordered net benefits are also aggregated at the cantonal and voting day level. Column (1) includes all voting days with only one proposition, column (2) all voting days with two concurrent propositions, and column (3) those with three concurrent propositions.[1] The results in columns (1)-(3) are consistent with the findings in Figure 3, that higher net benefits are more relevant determinants of the individual turnout decision.

Table B.2: Effect of Ordered Net Benefits on Administrative Turnout

	Dependent variable: Turnout		
	(1)	(2)	(3)
U^{1st}	2.304***	2.157**	1.459*
	(0.884)	(0.982)	(0.758)
U^{2nd}		0.036	−0.219
		(0.728)	(1.099)
U^{3rd}			0.402
			(0.867)
No. of propositions	1	2	3
No. of voting days	14	27	30
Observations	318	1,168	2,085

Note: The dependent variable for all three regressions is the average administrative turnout at the cantonal and voting day level. We control for gender, marital status, age, education, and political knowledge by including the average shares at the cantonal and voting day level of these variables. The robust standard errors with two-way clustering by canton and voting day are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Binary Utility Measures and Turnout — Since our theoretical model in Section 2 predicts that an individual will go to the polls if the utility of voting is strictly positive, we create binary utility measures for a robustness test. We first order the proposition net benefits per voting day and then create an indicator for each proposition net benefit that equals one if the net benefit is strictly positive. Table B.3 presents the results of estimating equation (6) with these binary utility measures. The results in Table B.3 support the finding that the propositions with the highest net benefit have a

1. Voting days with more than three concurrent propositions do not allow for precise estimations due to a lack of statistical power and are therefore excluded.

stronger marginal effect on turnout than propositions with lower net benefits.

Table B.3: Effect of Ordered Net Benefits on Turnout with Binary Utility Measures for Voters

	Dependent variable: Turnout				
	(1)	(2)	(3)	(4)	(5)
$1\{U^{1st} > 0\}$	20.923***	17.273***	17.274***	14.569***	17.001***
	(1.961)	(2.239)	(3.609)	(2.636)	(3.756)
$1\{U^{2nd} > 0\}$		10.255***	10.329***	3.534	10.455***
		(1.406)	(2.574)	(3.819)	(2.579)
$1\{U^{3rd} > 0\}$			3.871**	5.897	1.897
			(1.503)	(3.941)	(4.712)
$1\{U^{4th} > 0\}$				7.188**	6.925*
				(2.602)	(3.680)
$1\{U^{5th} > 0\}$					7.289***
					(1.949)
No. of propositions	1	2	3	4	5
No. of voting days	14	27	30	12	11
Observations	12,268	21,315	25,944	9,249	9,246

Note: The dependent variable is individual self-reported turnout, re-scaled from 0 to 100 and the utility measures are binary. All regressions include canton and year fixed effects. The robust standard errors in parentheses in columns (1)-(5) are two-way clustered by canton and voting day. *** p<0.01, ** p<0.05, * p<0.1.

Ordered Net Benefits and Turnout with Logistic Regression — Since the main analysis consists of a binary outcome variable and relies on a linear probability model, we test in a further robustness test whether the results that the highest proposition net benefit is the most relevant determinant of turnout holds when we apply logistic regressions. Table B.4 presents how each individual ordered proposition net benefit affects turnout by estimating a logistic regression with each proposition net benefit of a respondent as a separate independent variable. The results indicate that the main pattern is robust to a change in the functional form.

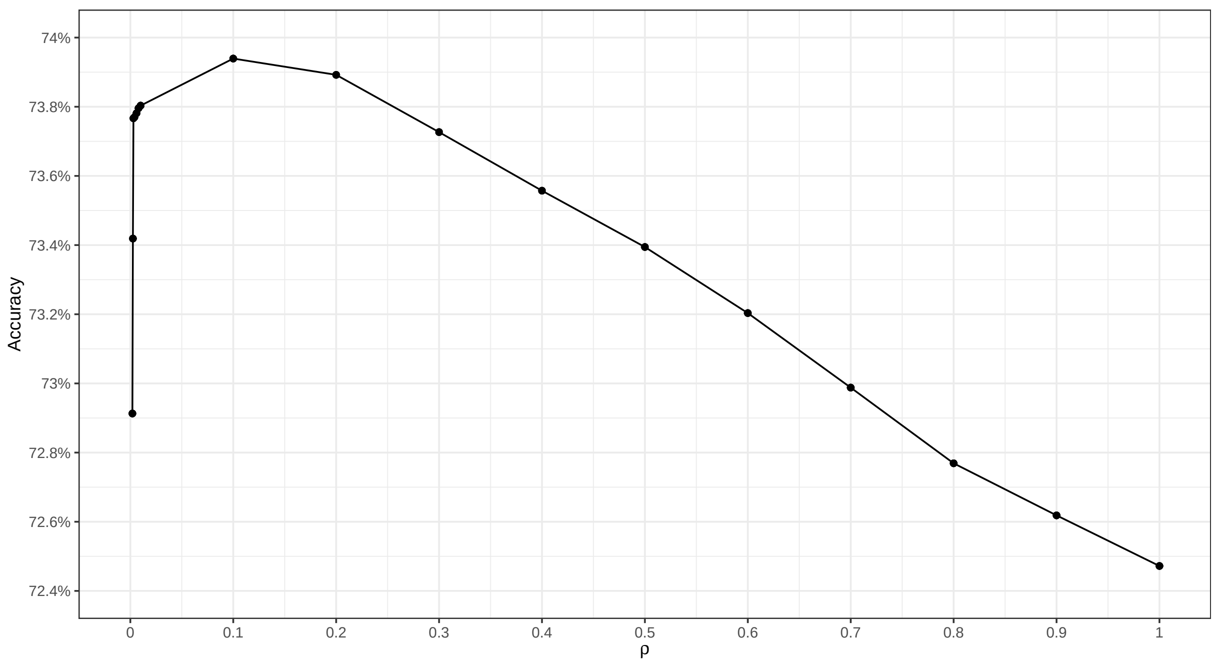
Table B.4: Marginal Effect of Ordered Net Benefits on Turnout

	Dependent variable: Turnout					
	(1)	(2)	(3)	(4)	(5)	(6)
U^{1st}	3.362***	2.543***	2.473***	1.938***	3.072***	3.210**
	(0.170)	(0.155)	(0.140)	(0.263)	(0.315)	(0.188)
U^{2nd}		1.216***	1.305***	0.753*	1.236***	−2.669
		(0.160)	(0.176)	(0.376)	(0.367)	(0.813)
U^{3rd}			0.591***	0.396	-0.040	1.343
			(0.164)	(0.411)	(0.357)	(1.812)
U^{4th}				0.899**	0.749*	0.033
				(0.360)	(0.387)	(2.085)
U^{5th}					0.989**	1.806
					(0.320)	(0.477)
U^{6th}						0.059
						(0.043)
No. of propositions	1	2	3	4	5	6
No. of voting days	14	27	30	12	11	2
Observations	12,268	21,315	25,944	9,249	9,246	1,470

Note: The dependent variable is individual self-reported turnout, re-scaled from 0 to 100. The table presents the average marginal effects of logistic regressions in percentage points. All regressions include canton and year fixed effects, and control variables for gender, marital status, age, education, political knowledge, and the legal form of the propositions. The robust standard errors in parentheses in columns (1)-(5) are two-way clustered by canton and voting day, and in column (6) they are one-way clustered by canton because the analysis includes only two voting days. *** p<0.01, ** p<0.05, * p<0.1.

Changes to our Central Parameter ρ — The reduced-form results suggest that turnout on a voting day is affected by both the maximum and the sum of proposition net benefits and that propositions with a higher net benefit are more important determinants of the turnout decision. This lends support to our theoretical model. We complement these findings with a more structural approach. Based on the model described in Section 2, we predict the individual turnout decision for different values of ρ and then compare the predicted turnout with the actually observed turnout. The resulting prediction accuracy is the share of correctly predicted turnout decisions which is depicted in Figure B.4 for different values of ρ. These results show a limit value of $\rho = 1$, which is equivalent to taking the sum over all proposition net benefits per voting day, leading to the lowest prediction accuracy. At the other end of the spectrum, a model calibration with $\rho \to 0$ puts a lot of weight on the proposition with the highest net benefit and is slightly more accurate than the model with $\rho = 1$. However, a parameterized model with $\rho = 0.1$, which puts more weight on the higher proposition net benefits, gives us the highest prediction accuracy. The concave function in Figure B.4 indicates that not every proposition has the same importance for an individual's turnout decision, but neither does the proposition with the highest net benefit alone.

Figure B.4: Accuracy for Different Values of ρ



Note: The graph shows the accuracy of the predicted individual turnout based on equation (2) with different values for ρ. When $\rho = 1$, the model simply takes the sum over all proposition net benefits per voting day. When $\rho \to 0$, the model puts a lot of weight on the proposition with the highest net benefit per voting day.